

**PLANNING FOR AGRICULTURAL DEVELOPMENT**

**OF THE**

**Western Plateau and Hills Region**

**(Zone 9)**

**DEVELOPMENT STRATEGIES**

**ZONAL PLANNING TEAM**

**Marathwada Agricultural University, Parbhani**

**and**

**Gokhale Institute of Politics and Economics, Pune**

**ZONE (IX).**

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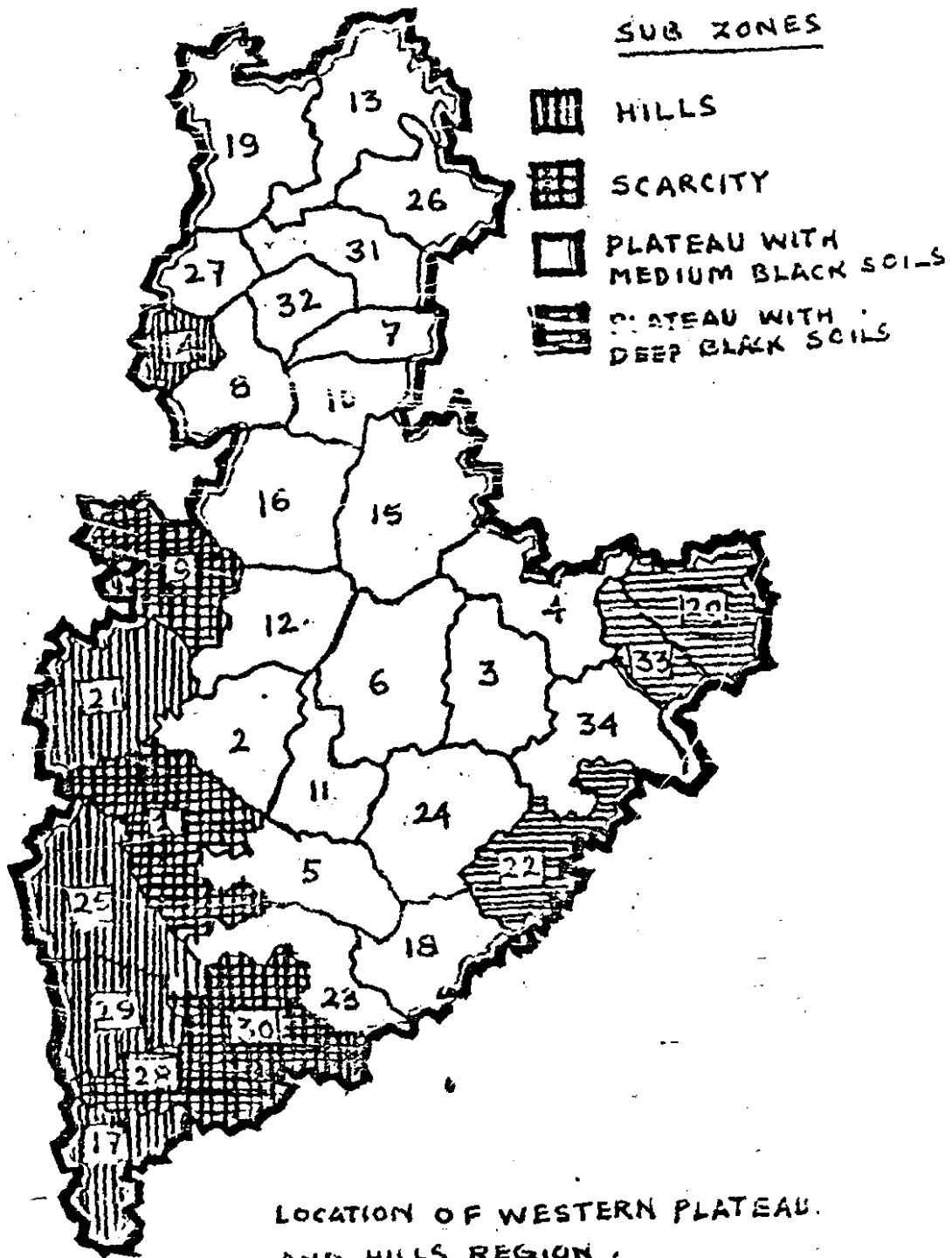
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## INTRODUCTION

The Western Plateau and Hills Region (Zone 9) comprises a major part of Maharashtra (22 districts), a sizable part of Madhya Pradesh (11 districts) and a small part of Rajasthan (1 district). Considering district as a unit, together with dominant features of soil attributes, cropping and rainfall patterns, the different districts are reallocated into four sub-zones for the purpose of Zonal profile and thrust areas of development. The nomenclatures of these sub-zones are : (1) Hills sub-zone, (2) Scarcity sub-zone, (3) Plateau sub-zone with relatively medium black soils and (4) Plateau sub-zone with medium to deep black soil (Fig.1). Physiographically, a major part of the zone comes under Deccan and Malwa Plateau with Satpuda, Satmala and Vindyan mountains with many non-perennial rivers and a few perennial rivers like Godavari, Krishna, Bhima, Purna and Chambal running through the zone. The annual average precipitation varies from 602 to 1040 mm in the scarcity sub-zone to plateau sub-zone with medium to deep black soils, respectively. The potential evapotranspiration (PET) value observed was 1618 mm in the hills sub-zone whereas the highest PET value of 1913 mm was recorded in the plateau sub-zone with medium to deep black soils. The details of the rainfall, major soil types, PET and important crops cultivated are given in Table 1-. The geographical area of zone-9 is 33.22 m.ha, out of which 21.48 m ha area is under cultivation. The occurrence of medium black soils to an extent of 52% of the total geographical area, 11.0% area under forests and large area under ravines and gullies are the typical features of this zone.



2 Table 1: Agro-climatic Sub-zones of Western Plateau and Hill Region

Sr. No.	Sub-Zone	Name of districts	Rainfall Range (mm/y)	Major soil type	PET (mm/y)	Major crops
1	2	3	4	5	6	7
1.	Hills-Sub-zone (5)	<u>Nasik</u> , <u>Kolhapur</u> , <u>Satara</u> , <u>Pune</u> and <u>Jhabua</u> .	803-1150	Laterite, Red Brown, Light soil and medium black	1618	<u>Jowar</u> , <u>Bajra</u> , <u>Rice</u> , <u>G.Nut</u> , <u>Wheat</u> , <u>Gram</u> , <u>S.cane</u> , <u>Horticulture</u> , <u>Mango</u> , <u>Cashew</u> , <u>Coconut</u> .
2.	Scarcity Sub-zone (4)	<u>Sangli</u> , <u>Solapur</u> , <u>Ahmednagar</u> and <u>Dhule</u> .	579- 674	Medium black and shallow black.	1698	<u>Jowar</u> , <u>Bajra</u> , <u>Wheat</u> , <u>G.Nut</u> , <u>Safflower</u> , <u>S.cane</u> , <u>Horticulture</u> - <u>Grape</u> , <u>Pomegranate</u> , <u>Ber</u> and <u>Condiments</u> .
3.	Plateau Sub-zone with medium black soils (21)	<u>Aurangabad</u> , <u>Beed</u> , <u>Jalna</u> , <u>Parbhani</u> , <u>Osmanabad</u> , <u>Latur</u> , <u>Buldhana</u> , <u>Amravati</u> , <u>Akola</u> , <u>Solgaon</u> , <u>Indore</u> , <u>Dhar</u> , <u>Retlam</u> , <u>Khargone</u> , <u>Mandsour</u> , <u>Dewas</u> , <u>Shajapur</u> , <u>Rajgarh</u> , <u>Ujjain</u> , <u>Jhalwar</u> and <u>Khandwa</u> .	668-1101	Medium black	1734	<u>Jowar</u> , <u>Cotton</u> , <u>Wheat</u> , <u>Gram</u> , <u>Tur</u> , <u>G.nut</u> , <u>Horticulture</u> - <u>Banana</u> , <u>Citrus</u> , <u>Mango</u> , <u>Ber</u> <u>Pomegranate</u> .
4.	Plateau sub-zone with medium to deep black soils (4)	<u>Nanded</u> , <u>Yeotmal</u> , <u>Vardha</u> , and <u>Nagpur</u> .	901-1176	Medium and Deep Black.	1913	<u>Cotton</u> , <u>Jowar</u> , <u>Wheat</u> , <u>Tur</u> , <u>Rice</u> , <u>Horticulture</u> - <u>Citrus</u> , <u>Banana</u> , <u>Mango</u> , <u>Guava</u> , <u>Chillies</u> .
Zone Average			904		1724	

( The districts underlined are drought-prone districts as per Irrigation Commission, 1972)

Zone-8 is one of the largest agro-climatic zones of the country with 56 million population and population density of 169 persons per sq.km. Crop husbandry is the main occupation in rural areas with meagre supporting economic activities. The major part of the zone is subject to climatic constraints except a few exceptional districts falling in sub-zone I and IV, This natural constraints, always acts as a barrier for agricultural development due to frequent droughts. Irrigation covers only about 13 per cent of the cropped area leaving its vast area rainfed. Soil and in situ moisture conservation would go a long way in improving productivity and living standards, apart from preserving ecological balance. Soil and moisture conservation needs to be approached through an integrated watershed development. All the sub-zones have to be brought under this approach though, specific treatments would differ for each of them and even at the level of watershed.

Some pockets of this zone have attained considerable growth due to supportive irrigation under major and medium command areas. Further extension of major irrigation (through canals) has to be taken up cautiously. Alternatively, added emphasis is necessary on tank and well irrigation in sub-zones II, III and IV in that order of preference.

Crop husbandry is the main economic activity both under irrigated and rainfed areas of the zone. However, barring a few exceptional cases the zone has very low growth rates in crop productivity. Jowar and cotton are the major crops. Sugarcane, pulses and oilseeds have the second important place in the crop economy. All the sub-zones would under go certain crop pattern changes following the watershed treatments and irrigation extension. More specifically, sub-zones I, II and III need a shift in the crop pattern from bajra, cotton, rabi jowar, wheat to pulses and oilseeds.

Horticulture has been a successful economic activity helping to improve human nutrition, economic status, generation of employment in some parts of the zone. Considering the climate, soil, water sources and high monetary returns, horticulture is recommended as a supporting strategy with crop production. Specifically in sub-zone II and III, extensive horticultural crops are recommended. Sub-zone I and IV also have congenial climate for the development of horticulture.

Dominance of low value crops with climatic and environmental constraints, long term crop production strategy and production of substantial agricultural by-products and higher density of landless labourers in rural areas of zone offer a very good scope for livestock and poultry development. The poultry development has great potential in sub-zones I, II and III. The cattle and sheep-goat activity should have significant emphasis in sub-zones I, III and I, II respectively.

Agro-processing, though, a potential activity it could not take momentum in the zone. The sorghum based cropping system provides a new avenue for its utilization for agro-processing because of surplus of kharif sorghum in sub-zones III and IV. Pomegranate, citrus, banana, mango, grapes are emerged out to be the lead horticultural crops of the zone. Sub-zones II and III have great potential for horticultural development and interturn fruit processing technology.

Forestry and fodder production offer good scope in the zone because of its considerable area under cultivable waste, gullies, ravines, mountain-hills on one hand and high density of livestock and restricted availability of area for fodder production on the other hand.



The hills sub-zone and plateau with relatively medium black soils sub-zone have been identified as potential sub-zones for forestry and pasture development. Further forestry is to be interlinked with horticulture especially in sub-zone I.

The sub-zonewise priorities and thrust areas are given in Table 2.

Table 2: Sub-zonewise priorities on the proposed strategies

Strategies	Sub-zones			
	I	II	III	IV
1. Land Resource Management through watershed Development.	1	1	1	1
2. Irrigation Development	2	1	1	1
3. Horticulture Development	2	1	1	2
4. Crop production	1	1	1	1
5. Livestock Development				
a) Cattle	1	2	1	2
b) Sheep & Goat	1	1	2	2
c) Poultry	1	1	1	2
6. Agro-processing	2	1	1	2
7. Forest Development				
a) Forestry	1	2	1	1
b) Pasture Development	1	1	1	2

NOTE : Numbers below sub-zones against the strategies indicate priority levels.

# 1. LAND RESOURCE MANAGEMENT THROUGH WATERSHED DEVELOPMENT

## 1.1 Rationale :

Watershed development is the major resource development activity identified in the rainfed tracts of the zone which covers about 86 per cent of the cropped area. Even with the total exploitation of irrigation potential, (Major as well as minor) sizable area would remain rainfed. Given the climatic and topographical constraints and resource base the prime strategy of agricultural development should involve land and water & resource management on the basis of watershed. Micro Watershed Management involves total resources conservation including soil-water, forests, pastures, horticulture and crop economy. Another additional aspect of soil management is the reclamation of eroded and water-logged areas in some of the irrigated pockets of the zone.

## 1.2 Approach

In the Western Plateau and Hills Zone 19 million hectares of net cropped area is rainfed. This area along with forest, pastures, waste lands need to be treated under watershed development approach. Substantial area of sub-zone III and Sub-zone II falls under rainfed condition. Taking an average Micro-watershed of 1500 hectares, we have identified total of 21284 watersheds in the zone.

Table 1: Extent of coverage :

Sub-Zone	Rainfed area (Mill.Ha.)	Net irrigated area(Mill.ha)	Total number of feasible Micro Watersheds identified
I	2.75	0.51	3206
II	3.09	0.59	3417
III	10.54	1.44	12135
IV	2.24	0.32	2526
Zone-Total	18.62	2.86	21284

The watershed treatment requires contour bunding, broad bed and furrow system, terracing, land levelling and land shaping, water harvesting structures, (nalla bunding, cheak-dams),<sup>and</sup> soil conservation structures (gully plugging, contour bunding, ravine arresting structures). Apart from this, the uncultivated lands such as cultivable wastes, other fallows, degraded forest lands, common property grass lands need different treatments. The treatments may include soci forestry, agro-forestry, dryland horticultural crops, fodder development etc.

Some of these programmes are presently undertaken by both the State Governments under different schemes like Soil Conservation, Comprehensive Watershed Development Programme, National Watershed Development Programme, EGS, RLEGP, DPAD, NREP, etc. The multiplicity of the schemes involving the programme is counter productive for effective implementation of the approach.

The cost structure of the programme varies across regions, districts and even on the basis of soil and climatic features. The average costs of some of the components of the programme are as follows :

1. Watershed Development : Rs. 2500 per hectare
2. Contour bundings, vegetative bundings and BBF : Rs. 1500 per hectare (with some contribution from the farmer).
3. Water harvesting structures : Rs. 29000 per hectare of command area.
4. Water storage tanks : Rs. 2 lakh for catchment area of 0.2 Square mile.

Given this cost structure it is possible to estimate the total requirements of the zone at Sub-zonal level. However, a careful plan needs to be drawn taking a group of micro-watersheds. The groups of micro watersheds can be identified not only on the basis of geographical vicinity but also by their line of treatments.

### 1.3 Line of action :

This programme, being the prime activity in the Western Plateau and Hills Region needs massive investment to achieve the watershed targets of 21284. Hence a long term plan needs to be worked out. If we can phase the programme in-to four phases, the area coverage and investment required for one phase would be as follows:-

Table 2: Extent of coverage in the First Phase

Sub-Zone	Area to be covered during first phase ( M.ha)	Estimated cost ( M.ha.) <u>M Rs</u>
I	1.20	3,000
II	1.28	3,200
III	4.55	11,375
IV	<u>0.94</u>	2,350
Total	7.97	<u>19,925</u>

Out of 18.62 M.ha rainfed area in the zone, watershed programme on 7.97 M.ha is worked out in the first phase. According to Dr Bali, only 2.79 M.ha area can be brought under watershed programme in the zone, which is also a massive mandate. When the State Government officials were consulted, they had an opinion that with the existing infrastructure about 8 lakhs ha. can be effectively brought under watershed treatment in Maharashtra. But this rate would be too slow to reach the targets and hence, the team suggests that on pilot basis, a watershed programme of 1.588 M. ha may be taken up in the zone with the following sub-zonewise targets.

Table 3: Extent of coverage on Pilot Basis

Sub-zone	Area to be covered in VIII Plan(M.ha)	Estimated cost for VIII Plan (M.₹)
I	0.240	600
II	0.256	640
III	0.910	2275
IV	0.182	470
<b>Total</b>	<b>1.588</b>	<b>3985</b>

Further, districtwise targets and area covered under watershed during VIII Plan are shown in Table 4. The estimated cost to bring 1.588 M.ha area under watershed during VIII Plan would be Rs. 3985 millions.

#### 1.4 Institutional Mechanism :

The development of watersheds is not an entirely new programme in the sub-zones, infact both in Maharashtra and Madhya Pradesh different programmes are in operation. However, the success of the Government Programme is limited to the engineering aspects of the programme. It has been noted that the community participation in the programme is very limited and this brings into focus the sustainability of water and soil conservation structures over a long time. If the sustainability of the programme and its impact is desired in full, it is necessary that the village community is involved at the planning and implementation level. The success of voluntary efforts of Adgaon, Palaskhed, Ralegan Siddhi and Naygaon gives an indication that the programme can be successful only with the involvement of the village community. We suggest that voluntary agencies, village panchayats or any other such agencies may be involved in the planning and implementation of watersheds. The full involvement of the village community can be assured only with their financial commitment in the programme. In other words, the watershed development programme should be

Table 4: Physical targets for Watershed Development during VIII Plan period

District	Rainfed area	No. of feasible water-sheds	Proposed (VIII) plan	No. of water-sheds	Estimated cost in million Rs.
Nasik	1.55	923	0.069	46	17.25
Dhule	1.41	906	0.0675	45	16.875
Jalgaon	1.15	715	0.054	36	13.3
Ahmednagar	1.69	1032	0.078	52	19.5
Pune	1.52	905	0.0675	45	16.875
Satara	1.02	613	0.0465	31	11.625
Sangali	0.83	526	0.039	26	9.75
Solapur	1.49	953	0.072	48	18.00
Kholapur	0.74	487	0.036	24	9.0
Aurangabad	0.94	1020	0.765	51	19.125
Jalna	0.75	33	0.003	2	0.75
Parbhani	1.05	753	0.058	38	14.25
Beed	1.08	711	0.054	36	13.5
Nanded	0.99	651	0.0495	33	12.375
Osmanabad	0.71	889	0.066	44	16.5
Latur	0.66	12	0.0015	1	0.375
Buldhana	0.93	605	0.045	30	11.25
Akola	1.01	658	0.0495	33	12.375
Amravati	1.18	776	0.0585	39	14.625
Yeotmal	1.31	847	0.063	42	15.75
Wardha	0.58	388	0.0285	19	7.125
Nagpur	0.91	600	0.045	30	11.25
Indore	0.35	236	0.018	12	4.5
Khargaoon	1.29	827	0.0615	41	15.375
Mandsaur	0.84	503	0.0375	25	9.375
Ratlam	0.46	2777	0.021	14	5.25
Dhar	0.77	483	0.036	24	9.00
Dewas	0.66	435	0.033	22	8.25
Shajapur	0.57	347	0.0255	17	6.375
Rajgarh	0.57	363	0.027	18	6.375
Khandwa	1.06	696	0.0525	35	13.125
Ujjain	0.57	377	0.0285	19	7.125
Jhabua	0.64	353	0.027	18	6.75
Jhalawar	0.59	373	0.0285	19	7.125

Total Watersheds: 1015, Total area = 1.5225 Million ha.

implemented on the basis of subsidy rather than 100 per cent funding from the Government.

Presently the Watershed Development Programme is implemented by the Soil Conservation Department of State Government. Naturally, the emphasis is more on the technical aspects of Soil Conservation. The Karnataka model of integrated Watershed Development through an independent Dryland Development Board would be a suitable alternative. The Dryland Development Board has a competent multidisciplinary team drawn from the various parent departments of the State Government. This helps both for proper coordination and technical superiority. This approach may be followed in the zone.

#### 1.5 Funding :

On one hand huge amount of funds are required for this programme in the zone and it is difficult to generate that amount of plan resources for a single activity, on the other hand the programme calls for urgent steps to be taken in this direction. Considering the importance of the programme and the size of investment it is necessary that provision is made in plan funds, specifically for watershed development and assigned to Department of Agriculture. A contribution from the beneficiaries of the watersheds (about 25 per cent of the cost) would relieve the burden of public investment. The water conservation structures and small irrigation structures may be funded by institutional agencies like NABARD through Commercial Banks. Further the programme can be dovetailed with the existing employment generating programmes (EGS, JRY, RLEGP, DPAP) of the State and Central Government. This should, however, allow total flexibility to the implementing authorities for adjusting the programmes for the watershed management treatments. Usual riders of the individual programmes make it difficult for using the funds for watersheds.

IRRIGATION AND WATER MANAGEMENT2.1 Rationale:

Surface irrigation on large scale can not be recommended as the major strategy of the zone because of the predominance of black soils and ecological hazards involved in plateau area. However, available ground water potential can be tapped in phased manner conjunctively with minor and major irrigation schemes. Out of the total irrigated area about 58 per cent comes under the major command areas, which irrigates only about 7 per cent of the net cropped area. Of the total net cropped area only 18 per cent area comes under irrigation by all sources. Groundwater, besides being widely distributed and topologically neutral facilitates tiding over the deficiencies of canal and tank systems at crucial times and relatively less hazardous to the ecology.

2.2 Approach :

Being a water scarce region irrigation development has to be cautiously implemented along with the crop planning programme. Development of groundwater irrigation should form the main irrigation strategy. As regards, surface irrigation it is suggested that minor irrigation tanks, and community lift irrigation projects on existing water storages should be taken up in the suitable areas. As regards the methods of irrigation, drip and sprinkle irrigation may be preferred to the flow irrigation method for suitable crops.

Specific strategies may include following :

1. Construction of irrigation/ percolation tanks and renovation of old tanks.
2. A large scale programme of sinking dug wells/tube wells, dug cum bore wells in the area where ground water potential is under exploited.
3. A policy for optimum conjunctive use of groundwater and surface water with a proper check on cropping pattern.



4. Specific efforts have to be made to complete the delayed irrigation projects and to tap the under exploited potential. Many studies have indicated low returns to irrigation in major irrigation command areas. Our strategy on crop production has taken a note of this.
5. A systematic programme for improvement of problematic soils.

Unit cost of construction of water sources given by various agencies are as follows.

a. Open well	Rs. 20,000
b. Shallow tube wells	Rs. 45,000
c. Dug cum-bore wells	Rs. 18,000
d. Minor irrigation tanks	Rs. 2 lakh for a catchment area of 0.2 Sq. miles.
e. Drip irrigation system	Rs. 25,000
f. Reclamation of salt-affected soils.	Rs. 15,000/ha.

### 2.3 Line of action :

The zone has large unexploited irrigation potential both under surface and groundwater sources. However, taking into consideration advantages of minor irrigation schemes (both underground and surface water) over major irrigation, we propose that the emphasis should be on irrigation development through minor irrigation in this zone.

Table 1: Proposed programme for Irrigation Development

Sub-Zones	Net sown area (M.ha)	Existing irrigated area		Area proposed to be brought under irrigation (M.ha)
		Total (M.ha)	Of which under well irrigation (M.ha.)	
I	3.26	0.48	0.25	0.498
II	3.68	0.50	0.30	0.604
III	11.87	1.26	1.19	2.301
IV	2.58	0.11	0.08	0.664
<b>Total</b>	<b>21.39</b>	<b>2.35</b>	<b>1.82</b>	<b>4.667</b>

Taking clue from Second Irrigation Commission, we have assumed 30 per cent irrigated sown area as the productive level of irrigation in the zone. This is slightly below the ultimate irrigation potential available in the zone. If we assume the target of reaching 30 per cent net area sown under irrigation (of 1984-85 triennial average) by the next two decades we have to endeavour to bring about 4 million hectares of net sown area under irrigation. If this is spread into two components namely major and minor irrigation, we propose to bring about 60 per cent or 4 million hectares under minor irrigation and the rest can be developed through major irrigation works. Which means that by next two decades we propose to bring 2.4 million hectares under minor irrigation and 1.6 million hectares under major irrigation schemes. This target is ambitious as far as the past growth rates in irrigated areas are concerned and indeed a massive task to achieve in the next two decades, but then without proper protective irrigation network this zone is likely to suffer vagaries of monsoon quite often.

During the Eight Five Year Plan the targets for major and minor irrigation would be 0.4 and 0.6 million hectares respectively. The programme for the proposed dug wells and shallow tube wells during the plan period is given in Table-2. The programme suggests an investment (both from private and public sources) of Rs. 5670 millions.

Table 2: Proposed programme for Well Irrigation during Eighth Plan

Sub-zones	Proposed No. of Dug wells (in M.)	Proposed No. of shallow tube wells (in M.)	Total investment required (Rs. in M.)
I	0.0343	-	686.0
II	0.0413	-	826.0
III	0.1410	0.0235	3877.5
IV	0.0102	0.0017	280.5
<b>Total</b>	<b>0.2268</b>	<b>0.0252</b>	<b>5670.0</b>

Some portion (Rs. 83,000 ha. which accounts for 5 per cent area) of the irrigated area of the zone has problem of poor internal drainage water logging, salinity and sodicity. The total cost of soil reclamation would be Rs. 124.5 millions.

Tank and lift irrigation is the second component in the irrigation strategy. Tank irrigation may include both the schemes of lift irrigation (preferably on voluntary basis) and percolation tanks. Table 3 below presents the investment proposed during Eight Plan period on tank irrigation.

Table 3: Proposed programme for tank and lift irrigation

Sub-Zone	Proposed area under tank irrigation (in M.ha)	Total investment required (Rs. in M.)
I	0.049	192
II	0.051	200
III	0.129	506
IV	0.011	43
<b>Total</b>	<b>0.240</b>	<b>941</b>

Total investment of Rs. 941 million would be needed for the programme on tank irrigation which includes only the cost of construction of tanks. The cost of subsidy on the lift irrigation schemes could not be estimated because of lack of data on the location of the schemes and tanks. However, it is suggested that preference should be given to the voluntary schemes with subsidy from the Government upto 50 per cent of the cost of the scheme in the line of Pani Panchayat experiment.

As far as major irrigation is concerned, the existing delayed major/medium/ inter State projects should be completed on priority basis.

A soil reclamation (salinity and sodicity) research institute needs to be established to tackle the soil-water and other associated problems raised up due to perennial irrigation. This proposed research unit would cost about Rs. 4.2 millions towards recurring, non-recurring grants and pay and allowances

#### 2.4 Institutional Mechanism :

The institutional support for well irrigation has been working satisfactorily with NABARD as an apex body. However, it is essential that farmers are involved for implementing tank and minor lift irrigation schemes. An example of Panchayat from Purandar Taluka of Pune district can be quoted as a model of community involvement in lift irrigation. This will not only help in sustaining the assets created over long term but also reduce the public investment substantially. In order to deal with the problem of soil salinity and soil alkalinity, a Soil Science Research centre may be established with appropriate support from the State Government. It is also necessary to impart training in Water Management to the farmers from major irrigated areas to minimise the water losses and optimise the utilisable potential. This again can be achieved by all Rural Institution funded through CADA funds and managed by experts.

#### 2.5 Funding :

The funds for tank irrigation can be made available by the State Government with share from the Central Government. A large portion of this would be covered under watershed development strategy. It is, however, difficult to segregate the actual amount to be drawn from watershed development against the tank irrigation schemes. Well irrigation being a private investment activity large part of it would be borne by the farmers. Loans may be provided through institutional agencies and wherever possible subsidies may be given to the small and marginal farmers.

The districtwise plan proposal for irrigation development during VIII Plan is presented in Table 4. The development of minor irrigation through dugwells, tube wells, tanks and lift would cost Rs. 6611 millions. The major (29) and medium (82) irrigation projects in Maharashtra are under construction which need to be completed on priority basis during VIII plan period.

Table 4: Proposed targets for irrigation during VIII Plan period

Sr. No.	State/ Dist.	Net sown area (000 ha)	Net irrigat- ion area (000 ha)	Area proposed to be brought under irrigation(000 ha)
1	2	3	4	5
<u>MAHARASHTRA STATE</u>				
1.	Nasik	925.43	112.6	165.03
2.	Dhule	737.20	64.4	156.76
3.	Jalgaon	819.47	94.0	151.84
4.	Ahmednagar	1218.37	215.7	149.81
5.	Pune	1002.67	172.5	128.30
6.	Satara	586.20	117.3	55.56
7.	Sangli	602.40	79.0	101.74
8.	Solapur	1124.73	138.6	198.82
9.	Kolhapur	412.87	63.1	60.75
10.	Aurangabad	1306.77	51.4	340.63
11.	Jalna	N.A.	48.1	N.A.
12.	Parbhani	963.27	57.7	233.28
13.	Beed	796.43	116.4	122.53
14.	Nanded	742.53	30.5	192.26
15.	Osmanabad	1140.17	66.6	275.45
16.	Latur	NA	29.0	NA
17.	Buldhana	684.87	49.2	156.26
18.	Akola	821.80	18.3	228.24
19.	Amravati	720.60	30.8	185.38
20.	Yeotmal	857.70	20.3	237.01
21.	Wardha	432.23	15.6	114.07
22.	Nagpur	551.93	43.7	121.88
	22)Dists.	16437.64	1634.8	3375.60

Table 4 contd...

1	2	3	4	5
<u>MADHYA PRADESH</u>				
23.	Indore	259.6	62.9	14.98
24.	Khargaon	624.7	88.2	99.20
25.	Mandsour	542.0	113.9	48.70
26.	Ratlam	308.4	43.7	48.80
27.	Dhar	499.0	71.0	78.70
28.	Dewas	353.1	53.6	52.30
29.	Shajapur	421.8	56.8	69.70
30.	Rajgarh	401.7	42.3	96.20
31.	Khandwa	443.1	44.2	88.70
32.	Ujjain	459.1	64.0	73.70
33.	Jhabua	343.3	23.9	79.09
(11) Districts		4655.8	664.5	750.07
<u>RAJASTHAN</u>				
34.	Jhalwar	307.9	59.5	32.87
(01) District		307.9	59.5	32.87
Zone-9		21401.34	2358.8	4158.54

3.

### HORTICULTURE DEVELOPMENT

The zone-9 constitutes about 6 per cent of the total geographical area under fruits and vegetables contributing 6.20 per cent to the national production of fruits and vegetables. Besides, these crops play an important role in (i) human nutrition, (ii) improve economic status of farmers, (iii) generate employment potential, (iv) help in conservation of eco-system, (v) improve waste lands like hills, rocky area and saline and alkali soils and (vi) social forestry and watershed development programmes.

Thus, considering the climate, soil, water sources high monetary returns and social awareness the zone is ideally suited for development of irrigated as well as dryland horticultural crops.

Under irrigated horticulture this zone has unique distinction in having maximum area under citrus, banana, pomegranate, grape when compared with national level. The dryland horticultural crops include mango, ber, custard apple, tamarind, aonla and rainfed vegetables like bhindi, cucurbits, onion, tomato and brinjal. The area under spices and condiments (onion, chillies, coriander) is also highest in the country and contributes significantly to the national income. Thus, it appears that at zonal level horticulture is having good potential and should get priority in crop planning. The distribution of horticultural crops in various sub-zones and districts is given in Table 1 and 2, respectively.



Table 1: Distribution of horticultural crops in various sub-zones

Sr. No.	Sub-zone and No. of districts	Major horticultural crops
1.	Hills Sub-zone (5)	<p>Fruits: Mango, Grape, Pomegranate, Ber, Guava, Sapota, Cashew and Coconut.</p> <p>Vegetables: Onion, Potato, Tomato</p> <p>Flowers: Roses, Jasmine, Aster, Tuberose.</p>
2.	Scarcity Sub-Zone(4)	<p>Fruits: Grape, Pomegranate, Ber, Kagzilime, Mango, Custard apple.</p> <p>Vegetables: Bhindi, Tomato, Condi-ments, Cucumber.</p> <p>Flowers: Roses, Chrysanthemum, Jasmine, Merigold.</p>
3.	Plateau Sub-zone with medium black soils(21)	<p>Fruits: Banana, Citrus, Mango, Ber, Pomegranate, Sapota, Guava, Grape, Tamarind, Custard apple.</p> <p>Vegetables: Brinjal, Chillies, Tomato, Onion, Condi-ments, Bhendi, Cucur-bits.</p> <p>Flowers: Jasmine (Mogra), Gailla-rdia.</p>
4.	Plateau Sub-zone with medium to deep black soils(4)	<p>Fruits: Citrus, Banana, Mango, Guava.</p> <p>Vegetables: Chillies, Onion, Brinjal, Bhendi.</p> <p>Flowers: Jasmine, Merigold.</p>

Table 2: Area under fruits, vegetables and condiments  
in Zone-9. (ha.)

Sr. No.	Name of the district/ Sub-zone	Fruits	Vegetables	Condiments
1	2	3	4	5
<b>I. HILLS SUB-ZONE</b>				
1.	Kolhapur	200	2,000	8,000
2.	Nasik	2400	26,900	4,400
3.	Satara	500	4,900	5,900
4.	Pune	4100	20,900	4,900
5.	Jhubwa	28	-	873
	Total	7228	54,700	21,073
<b>II) SCARCITY SUB-ZONE</b>				
1.	Sangli	700	200	9,500
2.	Solapur	1200	8,000	5,400
3.	Ahmednagar	2900	6,800	4,000
4.	Dhule	1800	3,900	7,000
	Total	6600	18,900	25,900
<b>III) PLATEAU SUB-ZONE WITH MEDIUM BLACK SOILS</b>				
1.	Parbhani	3100	2,100	6,000
2.	Aurangabad	4700	2,700	7,100
3.	Jalna	1000	1,200	7,000
4.	Beed	1000	1,200	7,000
5.	Osmanabad	2000	5,000	20,800
6.	Latur	2000	5,000	
7.	Jalgaon	36300	4,200	7,200
8.	Akola	900	1,600	2,600
9.	Buldhana	1200	2,100	3,000
10.	Amravati	8500	2,800	6,100
11.	Indore	611	8,145	1,827
12.	Dhar	1004	2,590	7,553

Contd...23

Table 2: Contd..

1	2	3	4	5
13.	Ujjain	730	2,821	6,872
14.	Mandosur	819	1,212	33,703
15.	Ratlam	139	1,617	13,513
16.	Dewas	398	2,844	1,355
17.	Shajapur	648	1,164	4,989
18.	Rajgarh	339	1,191	6,748
19.	Khargann	343	-	3,516
20.	Khandwa	1,840	-	2,196
21.	Jhalwar	-	-	-
Total		64,571	43,284	1,41,972

IV. PLATEAU SUB-ZONE WITH MEDIUM TO DEEP BLACK SOILS

1.	Nanded	3,000	1,700	23,200
2.	Yeotmal	1,400	1,900	3,800
3.	Vardha	3,000	1,800	1,800
4.	Nagpur	8,500	6,500	24,400
Total		15,900	11,900	53,200
Zone Total		94,299	1,28,748	2,45,145

### 3.1 Rationale :

Zone 9 projects a unique picture of horticultural development in respect of irrigated fruit crops, dryland fruit crops, vegetables and spices and condiments regarding area and production. The zone has the unique distinction of having sizable areas under banana and citrus each (36 th.ha), pomegranate (27 th ha.), grape (8 th.ha) and ber (10 th ha). These are the lead horticultural crops of the zone. The area(245 th.ha) under spices and condiments(chillies, onion, garlic, ginger) of this zone is also highest in the country as a whole. Sizable area (129 th.ha) is also under vegetables like tomato, brinjal, bhindi, peas, potato and sweet potato. The productivity (yield level) of banana, citrus and mango is satisfactory when compared with national level. Regarding yield level of grapes, pomegranate and ber, it is the highest at national level.

Citrus (Nagpur Orange, Mosambi and Kagzi lime) is the predominant crop in Sub-zone III (Plateau sub-zone with medium black soil) covering 21 districts (20 th.ha area) followed by Sub-zone IV (Plateau sub-zone with medium to deep black soils) spread over four districts (16 th.ha) with concentrated citrus pockets and are the world famous Nagpur Orange growing areas of the country. Nucellar Mosambi and Kagzi lime are the next important citrus crops of this sub-zone.

Banana is the next lead crop commercially very important again in sub-zone III followed by sub-zone IV. Pomegranate is a major crop in scarcity sub-zone III and I with medium black soils only. It ranks first in the country both in area and production. The area is quite meagre in other sub-zones. Production/yield is in increasing trend. Ber gained : a tremendous support/ increase in area (10,000 ha) in recent years in scarcity sub-zone II and

plateau sub-zone with medium black soils III. The other sub-zones are unsuitable due to high rainfall and heavy soils. Mango is the commercially important crop grown in every district of each sub-zone. It is the major crop under dryland conditions. Concentrated pockets are seen in sub-zone I and III and some area in sub-zone IV. Most of the orchards are of seedling origin of inferior types.

Grape is the high value cash crop in the scarcity sub-zone II and part of sub-zone I. The viticulture industry of Maharashtra State has gained world recognition for its production, area and quality of grapes.

The area is also increasing under high value minor crops like guava, sapota, tamarind, custard apple, fig and vegetables in these sub-zones.

### 3.2 Approach :

At zonal level the crops like banana, citrus, pomegranate and grape have shown good potential under irrigated conditions while mango, ber, custard apple, tamarind under dryland conditions due to favourable climate, soil and topography. The productivity of banana and citrus (5-7 t/ha) needs to be increased to double in sub-zone III and IV with suitable package of practices including improved varieties, ratooning, fertilizers, soil and water management practices. Banana may find place in command areas of the sub-zones. Santra (Mandarin) would be more suitable for plateau sub-zones with medium to light well drained soils free of lime content in assured rainfall zone (900-1176 mm). Whereas Nucellar mosambi and kagzi lime should be encouraged in Sub-zones II and III with medium to shallow soils with 579-900 mm rainfall pattern. The production technology of these crops need to be developed as a strategy of horticulture development. Constraints in marketing, storage and processing are yet to be solved for these crops. The cultivation

of more hardy crops like ber, custardapple, aonla, mango, tamarind should be encouraged on hills, slopes, rocky soils, waste lands, light soils, saline soils and on marginal and tribal areas of the sub-zones.

The sub-zone I is ideally suited for dryland crops like mango, custardapple, jamun, ber, jackfruit and tamarind and are recommended on hills and slopes.

If irrigation is available sapota, guava, fig, may be suggested as substitute/ suitable crops in this sub-zone. For increasing the yield and fruit quality of dryland as well as irrigated fruit crops special horticultural practices like use of intercrops during gestation period, mixed crops, companion cropping, use of improved grafted varieties and other management practices may be followed.

The sub-zones III and IV are the vital sub-zones for horticulture improvements for research priority. The income of mango and ber trees can be increased by converting inferior types to superior varieties by grafting.

In case of vegetables, all the sub-zones are potential areas for development of vegetable pockets specially near cities, towns, factory areas and in kitchen gardens. Research on rainfed vegetables is also important in all sub-zones. Vegetable yields can also be doubled by using pure good quality seed and improved agro-techniques.

The communication facilities are lacking in all sub-zones for effective marketing, storage and also lack of processing units.

### 3.3 Line of action.

For achieving the targetted yield and quality of fruits and vegetables following actions need to be initiated:

1. Establishment of Dryland Horticulture Research Unit (including processing) for each sub-zone (estimated at Rs. 3.9 m). For varietal improvement of mango, custard apple, ber, tamarind, aonla for high yield, regular and early types, and standardisation of agro-techniques to increase productivity
2. It is proposed to tailor the available technology and identify the constraints in transfer of technology through establishing operational research projects covering five districts with 1000 ha., area on mango, ber, custard apple, tamarind, aonla dryland fruits in each sub-zone. The estimated cost would be Rs. 3.7 million. The technical and extension support will be provided by University and State Departments, respectively.
3. Establishment of Irrigated Horticultural Research Unit for banana and citrus, grape, pomegranate in sub-zones III and IV separately, to evolve new/ suitable technology (Est. cost Rs. 4.2 million).
4. The increased area under fruits (mango, sapota, citrus, pomegranate, guava, etc) would demand huge planting material. This is possible either by establishing new fruit nurseries in each district/ University or strengthening of the existing nursery units in the sub-zone. It is also necessary to standardise the methods of propagation and rootstock. The estimated cost of nursery units would be Rs. 1.8 million.
5. The production technology of mango, custard apple, guava, citrus, grape, pomegranate, sapota in respect of spacing, rootstock, suitable intercrops, fertilizer and water requirement, use of growth regulators, plant protection etc needs investigation.

6. Drip units for citrus, grape, pomegranate and sapota as water saving device should be encouraged by the Government on subsidy. About 10,000 ha area should be covered in each sub-zone (cost of one unit Rs. 25,000/ha).
7. Farmers' Cooperative Marketing Units should be encouraged to ensure better and timely marketing of fruits and vegetables.
8. Co-operative Fruit/ Vegetable Processing Units be encouraged for mango, custardapple (pulp, juice), Cashewnut (juice, dehydration), pineapple (juice), citrus(juice, pickle) banana(juice, chips), grape ( rasin, winemaking), pomegranate (juice), guava (jelly) in the concentrated areas of the fruits. The agro-processing strategy has taken a note of it.
9. Development of post-harvest technology should be given a high priority through strengthening of the existing research support at University level. Fruit and vegetable preservation training units be established ( cost Rs. 3.0 million).
10. Seed production technology of vegetable crops and agro-techniques need research support (Rs. 4.5 million/project).
11. Floricultural crops around urban areas need to be encouraged.
12. Spices and condiments and some medicinal plants may be considered for research and development in sub-zone I and III (Rs. 4.0 million/ project).
13. About 15 to 25 per cent area should be increased in case of mango, citrus, banana, grape, pomegranate, ber, custardapple, tamarind, fruit crops and major vegetables (tomato, brinjal, bhendi, cucurbits, beans etc) spices and condiments,(onion, chillies, ginger, turmeric, coriander).



Percentage of additional area to be covered under horticultural crops :

Sr. NO.	Name of crop/ Sub-zone	I	II	III	IV	Per cent
1.	Banana	Nil	Nil	15%	10%	25
2.	Citrus	Nil	5 (Mosambi & K.lime)	15	10 (Santra)	30
3.	Pomegranate	5	15	5	Nil	25
4.	Mango	10	5	15	10	40
5.	Ber	5	15	10	5	35
6.	Grapes	5	10	5	Nil	20
7.	Guava	5	5	5	5	20
8.	Sapota	5	Nil	5	Nil	10
9.	Fig	5	5	2	Nil	12
10.	Custardapple	10	15	10	10	45
11.	Tamarind + Aonla	2	5	10	5	22
12.	Tomato+Brinjal + Bhendi	10	2	10	5	27
13.	Potato + Sweet potato	2	Nil	10	5	17
14.	Chillies + Onion + Ginger+ Turmeric	5	Nil	10	5	20
15.	Roses + Jasmines (Mogra)+ Chrysanthemum	2	2	3	2	9
Total		71	84	128	72	

Per cent additional area to existing area under the crops :

The additional area may be available from cultivable, uncultivable land, fallow land and waste lands out of (4.4 m ha from M.S. and 6.00 M.ha from M.P.) for dryland and irrigated horticultural crops. The projected additional increase in area is to be achieved in VIII, IX, X Plans.

The present area under fruit crops is 2.25 M ha and 4.14 M. ha under vegetables in the country. To meet the export demand and internal consumption of fruits and vegetables nearly 45 M. tonnes of fruits, 104 M tonnes of vegetables, 30 M tonnes of potatoes are required. Thus the area under fruits and vegetables has to be increased by 2000 A.D.

The proposed 15 to 25 per cent increase in area under various horticultural crops in zone No.9 would be essential to meet the normal dietary requirement of fruits and vegetables and export needs.

Proposed fruit belt priority/concentrated pockets in Zone 9

Sr. No.	Name of crop	Name of Sub-zone			
		Hill sub-zone(I)	Scarcity sub-zone (II)	Plateau sub-zone M.B.soils (III)	Plateau sub-zone with medium to deep black soils(IV)
1.	Banana	-	-	I	I
2.	Citrus	-	II	I	I
3.	Grape	II	I	II A'bad, Beed, Jalna, Os'bad, Latur	-
4.	Pomegranate	II	I	II	III
5.	Mango	I	III	1/II	1/II
6.	Cashewnut	I	-	-	-
7.	Ber, Custard-apple, Aonla	II	I	II	III
8.	Sapota, Guava.	I	III	II	III

Encouraging the specific fruit belts priorities in sub-zone/districts would solve many problems like marketing, processing and effective plant protection through cooperative efforts.

#### 3.4 Institutional Mechanism :

1. For proposed research the land is available with Agricultural Universities. Some infrastructure and staff will have to be provided. For Operational Research Projects the State Government will have to be approached for facilities and financial support.

2. Irrigated and Dryland Horticultural Research and Training Units may be attached to Universities working on these crops, and Operational Research Projects may be implemented by M.A.U., Parbhani and M.P.A.U., Rahuri with the support of State Directorate of Horticulture.

3. Financial credit/ support could be provided through Nationalised Banks, NABARD and other financial Institutions as crop loans on long terms basis as the gestation period (per-bearing) of fruits crop is very long. Similarly, the investment is also high.

#### 3.5 Funding/Phasing :

1. The action regarding establishment of Dryland and Irrigated Horticultural Research Unit, Vegetable Research Unit, Operational Research Project and Establishment of Nurseries etc may be initiated from the first year with full finance from Government of India. The evaluation of Operational Research Project will be undertaken in the Vth year of VIIIth Five Year Plan.

2. The credit component is essential for establishment of horticultural crops since these crops need substantial initial investment and the flow on returns starts only after a certain gestation period. The gestation periods for some of the Horticultural crops are given below.

Sr. No.	Initial cost thousand Rupees/ha	Gestation period year	Income expected Thousand.Rs./ha	
1.	Grape	50.00	2	75
2.	Pomegranate	20.00	2	60
3.	Citrus	5.50	5	35
4.	Banana	10.00	Nil	25
5.	Mango	6.30	7	22
6.	Ber	5.80	4	25

This suggests that the repayment of such loans may begin only after the gestation period or staggered for the the initial period. The staggered credit policy helps in the long run for development of horticultural crops.

### 3.6 Physical targets with financial requirements :

On the basis of climate, soils and cropping pattern this zone is divided into four sub-zones covering 34 districts, 22 from Maharashtra, 11 from Madhya Pradesh and one from Rajasthan. There is tremendous scope for development of horticulture in sub-zone II and III. Additional area of about 20 to 25 per cent is proposed for fruits and about 22 per cent for vegetables in various sub-zones. In the light of above facts there would be huge requirement of plants, seeds and other inputs. The research infrastructure is very poor in the various sub-zones. Accordingly, various physical targets with the financial requirements are prepared for each sub-zone.

- |  |                 |
|--|-----------------|
| 1. Establishment of dryland horticultural research and training centre including processing in each sub-zone.  | Rs. 3.9 million |
| 2. Establishment of Operational Research Project (ORP) one in each sub-zone.   | Rs. 3.7 million |
| 3. Establishment of Fruit Crop Nurseries   | Rs. 1.8 million |
| 4. <del>Establishment of Fruit Crop Nurseries</del>  |                 |
| 5. Strengthening of Post Harvest Technology at each Agril. University and Establishment of Fruit and Vegetable Preservation Training Unit.           | Rs. 3.0 million |
| 6. Seed Production Technology of Vegetable Crops and Research on Agro-techniques (one unit in every sub-zone)  | Rs. 4.5 million |
| 7. Spices, Condiments and Some Medicinal Plants Research and Development (one in each sub-zone.)   | Rs. 4.0 million |
| 8. Development of Fruit/Vegetable Processing Industry at Cooperative Sector level in every district of the zone.                                     | Rs. 8.0 million |
| 9. Development of Drip Irrigation Systems for Fruits and Vegetables, hybrid/improved vegetable seeds, fertilizers, rejuvenation of old orchards etc. | Rs. 2.0 million |

NOTE : Subsidy to the extent of 50 per cent on drip irrigation unit, 25 per cent of vegetable seeds and plants of improved varieties and on dryland hort-fruit crops is recommended.

Physical targets in Horticulture Development during VIII  
Five Year Plan (Zone-9) (Rs. in Million)

Physical Targets	Sub-zones				Total
	I	II	III	IV	
1. Dryland Horticultural Research & Training Centre.	3.9	3.9	3.9	3.9	15.6
2. Establishment of Operational Research Project	3.7	3.7	3.7	3.7	14.8
3. Establishment of Fruit Nurseries	1.8	1.8	1.8	1.8	7.2
4. Establishment of Irrigated Horticulture Research and Training Centre.	4.2	4.2	4.2	4.2	16.8
5. Strengthening of post Harvest Technology & Establishment of Fruit and Vegetable Preservation Unit.	3.0	3.0	3.0	3.0	12.0
6. Seed Production Technology of Vegetables and Research on Agro-Techniques.	4.5	4.5	4.5	4.5	18.0
7. Spices, Condiments and Medicinal Plants Research and Development.	4.0	4.0	4.0	4.0	16.0
8. Development of Vegetable processing Industry at Cooperative Sector level in every district.	40.0	32.0	168.0	32.0	272.0
<b>Total</b>	<b>65.1</b>	<b>57.1</b>	<b>193.1</b>	<b>57.1</b>	<b>372.4</b>

4.

CROP PRODUCTION

The zone is predominantly jowar and cotton growing one. The gross cropped area of the region is 23.18 m.ha. Out of 21.4 M.ha of net sown area, the area under irrigation is 2.87 M.ha which is about 13 per cent. Thus, nearly 87% of the zone is rainfed. Of the gross cropped area, cereals account for about 54% followed by pulses (18%), cotton (15%) and oilseeds (12%). The major crops grown are jowar, cotton, bajra, wheat and safflower. Apart from this, the zone has a significant contribution to the country's total sugar production.

4.1 Rationale :

Jowar, bajra, rice and groundnut, jowar, bajra, wheat and groundnut, jowar, cotton, wheat and gram and jowar, cotton, tur and wheat are the major crops in sub-zones I, II, III and IV respectively. The crops like wheat, gram, sugarcane and ragi in sub-zone I, sunflower, safflower, gram and cotton in sub-zone II, and rice, groundnut, linseed and sesamum in sub-zone IV are the important minor crops.

The yield levels of bajra in sub-zones I, II and III, cotton in sub-zones II, III and IV, groundnut in sub-zones III and IV and sugarcane in sub-zones I, II and III are very low and need substantial improvement.

The productivity growth rates are indicated in Table 1 for major crops in sub-zones.

Table 1: Productivity growth rates for major crops  
(1984-85 over 1975-76)

Sub-zone	Major crops	Productivity growth rate
I	Jowar	1.50
	Bajra	-1.04
	Rice	1.48
	Groundnut	1.50
II	Jowar	1.02
	Bajra	1.62
	Wheat	0.80
	Groundnut	0.00
III	Jowar	3.70
	Cotton	-0.60
	Wheat	3.82
	Gram	1.05
IV	Jowar	8.19
	Cotton	3.33
	Tur	0.92
	Wheat	0.50

The average productivity of different major crops at zone level is as below :

Table 2: Average yield of major crops (1984-85)

Sub-Zone	Major crops	Zone-9 Yield kg/ha	India yield kg/ha
I	Jowar	979	703
II	Cotton(Lint)	99.36	230
III	Bajra	386	646
IV	Wheat	1092	1885



It is evident from Table 2 that the productivity of jowar, predominant in the zone is 979 kg/ha which is numerically higher but there is vast scope to improve the productivity. Cotton, the next important crop has very low productivity (43.2% when compared to national average) and hence special emphasis is necessary to increase the yield. The yield levels of the other important crops of the zone when compared to national average i.e. wheat (57.7%) and bajra (59.8%) are also much less and needs attention for improvement. The major constraints for low productivity are:

- a. Shallow soils,
- b. Moisture stress
- c. Non-availability of irrigation
- d. Inadequate supply of HYVs
- e. Low fertilizer use.

#### 4.2 Approach :

The overall situation of major crops at the zonal and sub-zonal level calls for improvement through:

- i) Improvement in productivity levels.
- II) Crop substitution in zone/ sub-zones.
- III) Increasing cropping intensity and
- IV) Development of minor irrigation through tanks, wells, shallow tube wells, along with soil and water conservation measures.

The strategies at sub-zonal level can be spelt out as under :-

- a) The yields in various crops like jowar, cotton, wheat and sugarcane can be stepped up through measures like replacing local varieties by HYVs from the present levels of 60 to 70% to 80 to 90% timely sowing, optimum seed rate, higher fertilizer use and schedule of plant protection and short duration varieties suitable to moisture availability. Further, the yields of wheat can be stepped up by introducing thermoinsensitive varieties.

b) It is felt that crop substitution can be adopted in the below mentioned zones by the crops indicated therein:

Sr. No.	Sub-zone	Crop	Substitution crop	% area
1.	I	Rabi jowar	Safflower	25
2.	II	Cotton	Groundnut	10
3.	III	Rabi jowar	Safflower	25
4.	III	Wheat	Sunflower	10

c) (i) Cropping intensity can be increased to 13 per cent by sequential cropping of sorghum followed by safflower, sorghum followed by gram, green gram followed by rabi sorghum. This is all the more possible with watershed development accompanied by introduction of short duration varieties of these crops.

(ii) The stability of production through inter-cropping systems in sorghum with tur, green gram or soybean, bajra with tur and cotton with urd/soybean is possible. Thus, production per unit area can be improved.

d) The boostup of production in the area can also be expected after the increase in water harvesting devices like tanks, ponds, wells and dug-cum-bore wells, through watershed development programme.

e) Higher fertilizer use @ 50 kg N/ha + 25 kg  $P_2O_5$ /ha for rainfed cereals, 25 kg N + 50 kg  $P_2O_5$  for leguminous pulses and oilseed crops and 50 kg N/ha + 25 kg  $P_2O_5$  for non-leguminous oilseed crops, 250 kg N/ha + 110 kg  $P_2O_5$ , 110 kg  $K_2O$ /ha to sugarcane crops, 50 kg N + 25 kg  $P_2O_5$  and 80: 40: 40 NPK/ha for rainfed and irrigated cotton.

#### 4.3 Line of action :

Sequal to the constraints and remedies mentioned above, the below mentioned strategies emerge:

Table 3: Area proposed for replacement

Sub-Zone	Crop	Existing area(ha) 000'ha	Area proposed for replacement per cent area replaced.'000'ha.	Proposed crops with area for replacement(ha) '000' ha.
I	Jowar rabi	719.5	$\frac{179.87}{25\%}$	179.87 Safflower
II	Cotton	72.7	$\frac{7.27}{10\%}$	7.27 G.Nut
	Jowar rabi	154.2	$\frac{385.3}{25\%}$	385.3 Safflower
III	Wheat	1026.3	$\frac{102.3}{10\%}$	102.3 Sunflower

#### SUB- ZONE- I

Among the cereals, rabi jowar stands first with 66 lakh ha. followed by kharif jowar, wheat and maize. Tur and gram are the important pulses of the region, while groundnut is a major oilseed crop. The production of oilseeds and pulses can be increased by intercropping of tur in kharif jowar and short duration variety of groundnut in maize.

Irrigated crops : Sugarcane crop is an important irrigated crop of this sub-zone.

To protect and increase the productivity of s.cane in command areas of sub-zone I, optimum water use and proper water management should be ensured by adopting lift irrigation along with surface irrigation through canals. For this purpose, pumping of water through dug-cum-bore wells within the command needs to be adopted.

Availability of improved varieties of sugarcane is necessary to farmers through seed nurseries established for the purpose and there is need to create an awareness in the farmers community for timely planting of cane.

SUB-ZONE: II:

Kharif following practices in this zone should be discouraged for better moisture use, instead intercropping of tur in bajra should be widely recommended.

Kabi jowar is grown on large area but yields are very low in sub-zone II since it is grown on receding moisture on medium to deep soils. Hence, the area to the extent of 25% can be diverted in marginal lands to the kharif jowar where yields are more stable.

Intensity of cropping can be stepped up by following intercropping systems like sorghum-tur, sorghum-soybean and sorghum-green gram in sub-zone II and bajra-tur in sub-zone II. Irrigated cropping intensity can also be increased under irrigation by following multiple cropping of cotton-summer groundnut, sorghum-sunflower- summer groundnut in sub-zone.

To protect and increase the productivity of sugarcane in command areas of sub-zone II, optimum water use and proper water management should be ensured by adopting lift irrigation along with surface irrigation through canals. For this purpose, pumping of water through dug-cum-bore wells within the command needs to be adopted.

Availability of improved varieties of sugarcane is necessary for farmers through seed nurseries established for the purpose and there is need to create awareness in the farmers community for timely planting of cane.

### SUB-ZONE III

Kharif jowar is the major crop ~~grown in~~ almost all the districts except Rajgad of Madhya Pradesh. Cotton, wheat and groundnut are grown in most of the districts of the region. However, maize, urd, gram and paddy are cultivated in some districts of Madhya Pradesh. Soybean is the major crop grown in Indore district. There is vast scope for intercropping of tur in kharif jowar and bajra crop and sequence cropping of safflower after kharif jowar/ or bajra with the technique of minimum tillage is recommended for this zone. Besides this, soybean, green gram or black gram in kharif followed by rabi sorghum, safflower, or bengal gram in rain-fed areas and sunflower or wheat in irrigated areas in rabi season is a profitable cropping pattern for this zone.

#### IRRIGATED CROPS :

The other important irrigated cropping systems are kharif sorghum-rabi sunflower, cotton followed by summer groundnut and kharif sorghum followed by rabi wheat. With limited irrigation facilities, cropping system of kharif sorghum followed by irrigated safflower/ Bengal gram or maize followed by Bengal gram may be successfully adopted. In the rabi season soybean and sunflower, safflower and Bengal gram crops are showing good promise in the irrigated areas, where the temperature conditions are not very favourable for wheat.

In case of sub-zone III, the production per unit area could be increased by intercropping urd and soybean in about 20% area of cotton.

Cropping intensity can also be increased under irrigation by following multiple cropping of cotton-summer groundnut, sorghum-sunflower- summer groundnut.

To protect and increase the productivity of s.cane in command areas of sub-zones III, optimum water use and proper water management should be ensured by adopting lift irrigation along with surface irrigation through canals. For this purpose, pumping of water through dug-cum-bore wells within the command needs to be adopted.

Availability of improved varieties of sugarcane is necessary to farmers through seed nurseries established for the purpose and there is need to create awareness in the farmers community for timely planting of cane.

#### SUB-ZONE IV :

Among the cereals, kharif jowar is an important one followed by wheat and rabi jowar. Tur is the major pulse crop grown in the region. This region is specially suitable for taking intercropping of black gram or soybean in cotton and sequence cropping of safflower or bengal gram after kharif jowar with the technique of minimum tillage between harvesting of kharif jowar and sowing of safflower or gram.

Irrigation facilities of the area are limited to the extent of 10-12% and the major irrigation source is wells, followed by surface irrigation. By and large, cultivators follow the traditional methods for irrigating crops. Wheat is an important crop grown under irrigated conditions followed by summer groundnut and rabi sunflower. Sugarcane based cropping system with intercropping of onion, potato and cabbage is recommended in sugar factory areas.

Intensity of cropping can be increased by following sequential cropping of sorghum-safflower, sorghum-gram, green gram- rabi jowar and soybean- safflower, cotton-summer groundnut and rice-gram and rice- wheat in sub-zone IV.

#### 4.4 Institutional Mechanism :

In order to increase productivity of major crops like jowar, bajra, cotton, wheat and minor crops like gram, tur, sunflower and safflower, input supply infrastructures should be strengthened. Following action needs to be taken.

1. Long term seed production and supply plans should be prepared by the NSC, State Seed Corporation taking assistance of Agricultural Universities and State Department of Agriculture.
2. Distribution net work of seeds and fertilizers, plant protection measures be strengthened by opening more sale points and using mobile units to cater needs of hinter lands and difficult areas particularly in sub-zone III and IV.
3. Surveillance of pests and diseases and timely measures to combat them should be strengthened.
4. A definite plan for diversification of area from rabi to kharif in sub-zone II and substitution with high value crops in stipulated time frame for sub-zone I, II and III (Table 3) should be chalked out.

#### 4.5 Funding :

1. Adoption of intercropping, sequential cropping and replacement may be mostly private. However, farmers are to be encouraged for adoption through demonstrations.
2. Cooperative loan at Rs. 1500/- per hectare through NABARD, Cooperative and Commercial Banks be made available to farmers.
3. Government subsidy to the extent of 15-20% be given to the weaker sections.
4. Cooperative factories may take up the responsibilities of their jurisdiction for supply of timely improved material of sugarcane.

Targets for crop production for VIIIth Five Year Plan

Taking into consideration the higher use of improved varieties of crops with greater fertilizer use under rainfed as well as under irrigated conditions adoption of better management practices the growth rates of crop production have been fixed as below:

1.	Cereals except bajra	3.3% per annum		6.66
2.	Bajra	2.5 %	-do-	6.46
3.	Pulses	2.5%	-do-	
4.	Oilseeds	4.5%	-do-	
5.	Sugarcane	3.5%	-do-	
6.	Cotton	2.0%	-do-	

The districtwise and yearwise area as per the proposed crop substitution and production of cereals, pulses, oilseeds, sugarcane and cotton is given in Table 1 to 10

The targets of crop production are fixed as per the substitution of 25% of rabi jowar area in sub-zone I and II by safflower in view of increased requirement of oilseeds. As per the above crop substitution the estimated jowar production in the 22 districts of Maharashtra State in the beginning of VIIIth Five Year Plan will be 46.101 M.lakh tonnes and by the end of VIIIth Five Year Plan in the year 1994-95 will be 49.782 Lakh M. tonnes. Accordingly, estimated safflower production in the beginning of VIIIth Five Year Plan in the year 1990-91 will be 2 and by the end of VIIIth Five Year Plan it will be increased to 2 M.tonnes.

The estimated cotton production in the beginning of VIIIth Five Year Plan will be 13.259 lakh bales which will be increased by 13.94 lakh bales by the end of VIIIth Five Year Plan from the 22 districts of M.S. It is further suggested that the cotton crop on marginal and submarginal lands should be reduced by 2% per annum in order to increase per hectare yield and the above 2% area of cotton will be replaced by groundnut crop.



The pulses production in the State can be substantially boosted by adopting intercropping and sequence cropping suggested in the strategy for different sub-zones.

The targets of fertilizer requirement are calculated districtwise and yearwise in tonnes at the growth rate of 14 per annum in view of the past experience of fertilizer use. However, it is observed that the fertilizer is used mostly for the commercial crops such as sugarcane and cotton. It is necessary to emphasise use of moderate doses as per the local recommendations based on soil test for rainfed crops in order to increase the crop production on large rainfed areas. The targets of fertilizer requirement is given in Table 11.

The estimated fertilizer requirement of 22 districts of Maharashtra State for 1990-91 comes to 65118 tonnes of N, 27651 tonnes of P and 21224 tonnes of K, at the beginning of VIIIth Five Year Plan. The fertilizers required at the end of VIIIth Five Year Plan is 119180 tonnes of N, 60702 tonnes of P and 49847 tonnes of K for the 22 districts of Maharashtra State.

The improved/hybrid varieties of crops played a significant role in green revolution of the country. At present about 70% of the cropped area is covered under improved/hybrid crop, it is envisaged that by the end of VIIIth Five Year Plan about 90% area is required to be covered under improved/hybrid crops. The seed requirement will be met from State Seed Corporation/ National Seed Corporation/ Private Seed Dealers and the own seed used by the farmers. The targets of improved/hybrid seed required is given in Table 12.

Table :1: Targets of Area & Prcdution of Kharif Jowar for VIII FYP - for Western Plateau and Hill region - Zone 9.

1/0

Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Produ- ction	Area	Produ- ction	Area	Produ- ction	Area	Produ- ction	Area	Produ- ction.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
I. <u>HILLS SUB-ZONE</u>											
1.	Nasik	0.31	0.331	0.31	0.341	0.31	0.352	0.31	0.362	0.31	0.373
2.	Kolhapur	0.43	0.899	0.43	0.927	0.43	0.956	0.43	0.985	0.43	1.014
3.	Satara	0.91	1.374	0.91	1.418	0.91	1.462	0.91	1.506	0.91	1.549
4.	Pune	0.25	0.341	0.25	0.352	0.25	0.363	0.25	0.374	0.25	0.384
5.	Jhabua	0.33	0.217	0.33	0.224	0.33	0.231	0.33	0.238	0.33	0.245
Total :		2.23	3.162	2.23	3.262	2.23	3.364	2.23	3.465	2.23	3.565
II. <u>SCARCITY ZONE</u> :											
1.	Sangli	1.16	1.653	1.16	1.706	1.16	1.758	1.16	1.811	1.16	1.864
2.	Solapur	0.08	0.103	0.08	0.107	0.08	0.110	0.08	0.113	0.08	0.117
3.	Ahmednagar	0.16	0.196	0.16	0.203	0.16	0.209	0.16	0.215	0.16	0.221
4.	Dhule	0.93	0.868	0.93	0.895	0.93	0.923	0.93	0.951	0.93	0.979
Total :		2.33	2.820	2.33	2.911	2.33	3.000	2.33	3.090	2.33	3.181
III. <u>PLATEAU SUB-ZONE WITH RELATIVELY MEDIUM BLACK SOIL</u>											
1-	Aurangabad	0.56	0.506	0.56	0.522	0.56	0.539	0.56	0.555	0.56	0.571
2.	Beed	1.20	0.981	1.20	1.013	1.20	1.044	1.20	1.075	1.26	1.107
3.	Jalna	0.71	0.775	0.71	0.800	0.71	0.824	0.71	0.849	0.71	0.874
4.	Parbhani	1.77	1.725	1.77	1.780	1.77	1.835	1.77	1.890	1.77	1.946
5.	Osmanabad	1.78	1.870	1.78	1.929	1.78	1.989	1.78	2.049	1.78	2.109

Contd.

Contd.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
6.	Latur	1.46	1.260	1.46	1.301	1.46	1.341	1.46	1.381	1.46	1.421
7.	Buldhana	2.28	2.892	2.28	2.985	2.28	3.077	2.28	3.170	2.28	3.262
8.	Amraoti	1.89	2.428	1.89	2.505	1.89	2.583	1.89	2.660	1.89	2.738
9.	Akola	2.76	2.500	2.76	2.580	2.76	2.660	2.76	2.739	2.76	2.819
10.	Jalgaon	2.22	1.797	2.22	1.855	2.220	1.912	2.220	1.970	2.220	2.027
11.	Indore	0.45	0.372	0.450	0.384	0.450	0.396	0.450	0.408	0.450	0.419
12.	Khargaoon	1.66	1.167	1.660	1.205	1.660	1.242	1.660	1.279	1.660	1.316
13.	Mandsaur	1.29	0.971	1.290	1.002	1.290	1.033	1.290	1.064	1.290	1.095
14.	Ratlaum	0.54	0.403	0.540	0.416	0.540	0.429	0.540	0.441	0.540	0.454
15.	Dhar	0.68	0.341	0.680	0.352	0.680	0.363	0.680	0.374	0.680	0.384
16.	Tevas	1.06	1.240	1.060	1.279	1.060	1.319	1.060	1.358	1.060	1.398
17.	Shajapur	1.46	1.457	1.460	1.503	1.460	1.550	1.460	1.596	1.460	1.643
18.	Rajgarh	1.25	0.868	1.250	0.895	1.250	0.923	1.250	0.951	1.250	0.979
19.	Khandwa	1.16	1.023	1.160	1.055	1.160	1.088	1.160	1.121	1.160	1.153
20.	Ujjain	1.58	1.901	1.580	1.961	1.580	2.022	1.580	2.083	1.580	2.144
21.	Jhalwar	1.10	0.754	1.100	0.778	1.100	0.802	1.100	0.826	1.100	0.850
	Total :	28.86	27.231	28.86	28.100	28.86	28.975	28.86	29.859	28.86	30.709
IV. <u>PLATEAU SUB-ZONE WITH MEDIUM TO DEEP BLACK SOIL</u>											
1.	Nanded	2.51	2.583	2.51	2.665	2.51	2.748	2.51	2.830	2.51	2.913
2.	Yeotmal	2.43	3.016	2.43	3.113	2.43	3.209	2.43	3.305	2.43	3.402
3.	Wardha	1.23	1.415	1.23	1.425	1.23	1.506	1.23	1.551	1.23	1.596
4.	Nagpur	1.43	1.281	1.43	1.322	1.43	1.363	1.43	1.404	1.43	1.445
	Total :	7.60	8.295	7.60	8.525	8.60	8.826	7.60	9.090	7.60	9.356
	Grand Total :	41.02	41.508	41.02	42.790	41.02	44.165	41.02	45.504	41.02	46.811
	M.S.	28.46	30.794	28.46	31.744	28.46	32.767	28.46	33.745	28.46	34.731

Table :2: Targets of Area & Production of Rabi Jowar for VIII FYP for Western Plateau and Hill region Zone 9.

		Area in lakh ha. Production in lakh tonnes.									
Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Production	Area	Production	Area	Production	Area	Production	Area	Production
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
<b>I. Hilly region :</b>											
1.	Nasik	0.634	0.264	0.603	0.259	0.570	0.252	0.536	0.245	0.503	0.236
2.	Kolhapur	0.060	0.031	0.060	0.032	0.060	0.033	0.060	0.034	0.060	0.035
3.	Satara	1.501	0.962	1.422	0.940	1.343	0.915	1.264	0.887	1.185	0.856
4.	Pune	4.617	2.080	4.374	2.034	4.131	1.980	3.888	1.920	3.645	1.852
5.	Jhabua	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total :		6.812	3.337	6.459	3.265	6.104	3.180	5.748	3.086	5.393	2.979
<b>II. Scarcity region :</b>											
1.	Sangli	1.026	0.471	0.972	0.461	0.918	0.448	0.864	0.435	0.810	0.419
2.	Solapur	7.401	2.316	7.011	2.264	6.622	2.207	6.232	2.137	5.843	2.062
3.	Ahmadnagar	5.491	2.650	5.202	2.590	4.913	2.522	4.624	2.445	4.335	2.359
4.	Thule	0.808	0.570	0.765	0.556	0.723	0.542	0.680	0.525	0.638	0.507
Total :		14.727	6.007	13.950	5.871	13.176	5.719	12.400	5.542	11.626	5.347
<b>III. Central Plateau with Ass. Rainfall :</b>											
1.	Aurangabad	2.690	0.837	2.690	0.863	2.690	0.890	2.690	0.917	2.690	0.944
2.	Beed	2.750	1.291	2.750	1.333	2.750	1.374	2.750	1.415	2.750	1.456
3.	Jalna	1.490	0.754	1.490	0.778	1.490	0.802	1.490	0.826	1.490	0.850
4.	Parbhani	1.770	0.847	1.770	0.874	1.770	0.901	1.770	0.928	1.770	0.955
5.	Osmanabad	1.770	1.012	1.770	1.045	1.770	1.077	1.770	1.109	1.770	1.142

Contd.

Contd .

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
6. Latur	0.460	0.310	0.460	0.320	0.460	0.330	0.460	0.340	0.460	0.350	
7. Buldhana	0.010	0.0103	0.010	0.011	0.010	0.011	0.010	0.0113	0.010	0.0117	
8. Amraoti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
9. Akola	0.002	0.0010	0.002	0.0011	0.002	0.0011	0.002	0.00113	0.002	0.0012	
10. Jalgaon	0.420	0.400	0.420	0.413	0.422	0.425	0.422	0.438	0.422	0.451	
11. Indore	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
12. Kharagaon	0.080	0.059	0.08	0.061	0.08	0.063	0.08	0.065	0.08	0.066	
13. Mandasaur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
14. Ratlaum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
15. Dhar	0.02	0.0114	0.02	0.012	0.02	0.012	0.02	0.0125	0.02	0.013	
16. Devas	0.007	0.0083	0.007	0.0085	0.007	0.009	0.007	0.0091	0.007	0.0093	
17. Shajapur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
18. Rajgarh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
19. Khandwa	0.01	0.0093	0.01	0.0096	0.01	0.010	0.01	0.0102	0.01	1.105	
20. Ujjain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
21. Jhalwar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total :	11.479	5.550	11.479	5.729	11.479	5.905	11.479	6.082	11.479	6.260	
IV. <u>Mod. high rainfall zone :</u>											
1. Nanded	0.40	0.248	0.400	0.256	0.400	0.264	0.40	0.272	0.40	0.279	
2. Yeotmal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
3. Wardha	0.01	0.0041	0.01	0.0043	0.01	0.0044	0.01	0.0055	0.01	0.0057	
4. Nagpur	0.58	0.248	0.58	0.256	0.58	0.264	0.58	0.272	0.58	0.280	
Total :	0.99	0.501	0.99	0.516	0.99	0.532	0.99	0.589	0.99	0.564	
Grand Total :	34.008	15.394	32.878	15.382	31.745	15.337	30.617	15.299	29.488	15.150	
M.S.	33.513	15.307	32.761	15.290	31.632	15.242	30.500	15.202	29.371	15.051	

Table 3: Targets of Area & Production of Bajra for VIII FYP - for Western Plateau and Hills region - Zone 9.

Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Produ-	Area	Produ-	Area	Produ-	Area	Produ-	Area	Produ-
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Area in lakh ha. Production in lakh tonnes.											
1. <u>Hills sub-zone :</u>											
1.	Nasik	3.811	1.104	3.411	1.131	3.411	1.58	3.411	1.185	3.411	1.212
2.	Kolhapur	0.014	0.002	0.014	0.002	0.014	0.002	0.014	0.002	0.014	0.0023
3.	Satara	1.054	0.280	1.050	0.287	1.054	0.293	0.054	0.300	1.054	0.307
4.	Pune	1.478	0.610	1.478	0.625	1.478	0.640	1.478	0.655	1.478	0.670
5.	Jhabua	0.103	0.039	0.103	0.040	0.103	0.041	0.103	0.042	0.103	0.043
	Total :	6.06	2.035	6.06	2.085	6.06	2.134	6.06	2.184	6.06	2.234
2. <u>Scarcity Sub-zone :</u>											
1.	Sangli	0.896	0.180	0.896	0.185	0.896	0.189	0.896	0.194	0.896	0.198
2.	Solapur	0.362	0.121	0.362	0.123	0.362	0.127	0.362	0.130	0.362	0.133
3.	Ahmadnagar	2.843	1.038	2.843	1.064	2.843	1.089	2.843	1.114	2.843	1.140
4.	Dhule	1.357	0.862	1.357	0.883	1.357	0.905	1.357	0.925	1.357	0.986
	Total :	5.458	2.201	5.458	2.255	5.458	2.310	5.458	2.363	5.458	2.417
III. <u>Plateau Sub-zone with relatively medium black soils :</u>											
1.	Aurangabad	1.623	0.685	1.623	0.701	1.623	0.718	1.623	0.735	1.623	0.752
2.	Beed	1.280	0.558	1.280	0.571	1.280	0.585	1.280	0.598	1.280	0.612
3.	Jalna	0.455	0.201	0.455	0.206	0.455	0.211	0.455	0.216	0.455	0.221
4.	Parbhani	0.098	0.041	0.098	0.042	0.098	0.043	0.098	0.044	0.098	0.045
5.	Osmanabad	0.131	0.049	0.131	0.050	0.131	0.052	0.131	0.053	0.131	0.054
6.	Latur	0.105	0.037	0.105	0.038	0.105	0.039	0.105	0.040	0.105	0.041

Contd.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Buldhana	0.087	0.039	0.087	0.040	0.087	0.041	0.087	0.042	0.087	0.043	
8. Amraoti	0.053	0.021	0.053	0.021	0.053	0.022	0.053	0.022	0.053	0.023	
9. Akola	0.047	0.019	0.047	0.020	0.047	0.020	0.047	0.021	0.047	0.021	
10. Jalgaon	1.135	0.660	1.135	0.676	1.135	0.692	1.135	0.708	1.135	0.725	
11. Indore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
12. Kharqan	0.280	0.071	0.280	0.072	0.280	0.074	0.280	0.076	0.280	0.078	
13. Mandasaur	0.025	0.016	0.025	0.017	0.025	0.018	0.025	0.018	0.025	0.018	
14. Ratlaum	0.052	0.032	0.052	0.033	0.052	0.033	0.052	0.034	0.052	0.035	
15. Dhar.	0.076	0.028	0.076	0.028	0.076	0.029	0.076	0.030	0.076	0.030	
16. Devas	0.003	0.002	0.003	0.002	0.003	0.002	0.003	0.002	0.003	0.002	
17. Shajapur	0.001	0.007	0.011	0.007	0.011	0.008	0.011	0.008	0.011	0.008	
18. Rajgarh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
19. Khandwa	0.011	0.007	0.011	0.007	0.011	0.008	0.011	0.008	0.011	0.008	
20. Ujjain	0.019	0.013	0.019	0.014	0.019	0.014	0.019	0.014	0.019	0.015	
21. Jhalwar	0.034	0.013	0.034	0.014	0.034	0.014	0.034	0.014	0.034	0.015	
Total :	5.526	2.486	5.526	2.559	5.526	2.622	5.526	2.683	5.526	2.746	
<b>IV. Plateau Sub-Zone with medium to deep black soils :</b>											
1. Nanded	0.011	0.005	0.011	0.005	0.011	0.005	0.011	0.006	0.011	0.008	
2. Yeotmal	0.093	0.040	0.093	0.041	0.093	0.042	0.093	0.043	0.093	0.044	
3. Warcha	0.006	0.002	0.006	0.002	0.006	0.002	0.006	0.002	0.006	0.002	
4. Nagpur	0.005	0.002	0.005	0.002	0.005	0.002	0.005	0.002	0.005	0.002	
Total :	0.115	0.049	0.115	0.050	0.115	0.051	0.115	0.053	0.115	0.055	
Grand Total :	17.159	6.771	17.159	6.949	17.159	7.117	17.159	7.283	17.159	7.452	
M.S.	16.544	6.556	16.544	6.715	16.544	6.918	16.544	7.079	16.544	7.200	

Table :4: Targets of Area & Production of Wheat for VIII FYP for Western Plateau & Hills region of Zone 9.

		Area in lakh ha. Production in lakh tonnes.									
Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Production.	Area	Production.	Area	Production.	Area	Production.	Area	Production.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
<b>I. Hills Sub-zone :</b>											
1.	Nasik	0.930	0.630	0.930	0.650	0.930	0.670	0.930	0.591	0.930	0.711
2.	Kolhapur	0.190	0.217	0.190	0.224	0.190	0.231	0.190	0.238	0.190	0.245
3.	Satara	0.270	0.341	0.270	0.352	0.270	0.363	0.270	0.374	0.270	0.334
4.	Pune	0.470	0.568	0.470	0.586	0.470	0.604	0.470	0.623	0.470	0.641
5.	Jhabua	0.190	0.165	0.190	0.171	0.190	0.176	0.190	0.181	0.190	0.186
	Total :	2.050	1.921	2.050	1.993	2.050	2.044	2.050	2.107	2.050	2.167
<b>II. Scarcity sub-zone :</b>											
1.	Sangli	0.280	0.289	0.280	0.298	0.280	0.308	0.280	0.317	0.280	0.326
2.	Solapur	0.460	0.475	0.460	0.490	0.460	0.506	0.460	0.521	0.460	0.536
3.	Ahmadnagar	0.890	0.919	0.890	0.949	0.890	0.978	0.890	1.007	0.890	1.037
4.	Dhule	0.470	0.486	0.470	0.501	0.470	0.517	0.470	0.532	0.470	0.548
	Total :	2.100	2.169	2.100	2.238	2.100	2.309	2.100	2.377	2.100	2.447
<b>III. Plateau Sub-zone with relatively medium black soils :</b>											
1.	Aurangabad	0.470	0.213	0.461	0.215	0.451	0.218	0.442	0.220	0.432	0.221
2.	Beed	0.470	0.292	0.461	0.297	0.451	0.300	0.442	0.302	0.432	0.303
3.	Jalna	0.461	0.365	0.451	0.268	0.442	0.371	0.432	0.376	0.423	0.376
4.	Parbhani	0.617	0.536	0.605	0.544	0.592	0.547	0.580	0.551	0.567	0.557
5.	Osmanabad	0.392	0.334	0.384	0.339	0.376	0.341	0.368	0.343	0.360	0.347

Contd.



Contd.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
6. Latur			0.206	0.162	0.202	0.162	0.197	0.167	0.193	0.188	0.189	0.167
7. Buldhana			0.314	0.275	0.307	0.276	0.301	0.278	0.294	0.280	0.288	0.284
8. Amraoti			0.480	0.434	0.470	0.439	0.461	0.444	0.451	0.448	0.41	4.452
9. Akola			0.441	0.353	0.432	0.358	0.423	0.362	0.414	0.365	0.405	0.368
10. Jalgaon			0.461	0.497	0.451	0.207	0.442	0.508	0.432	0.511	0.423	0.513
11. Indore			0.755	1.367	0.739	1.382	0.724	1.395	0.708	1.406	0.693	1.417
12. Khargaoon			0.353	0.577	0.346	0.583	0.338	0.589	0.331	0.594	0.324	0.599
13. Mandasaur			0.637	1.235	0.624	1.248	0.611	1.259	0.598	1.271	0.585	1.279
14. Ratlaum			0.343	0.466	0.336	0.472	0.329	0.474	0.322	0.479	0.315	0.482
15. Dhar			0.764	0.971	0.749	0.983	0.733	0.992	0.718	1.000	0.702	1.007
16. Devas			0.549	0.810	0.538	0.819	0.526	0.826	0.515	0.833	0.504	0.839
17. Shajapur			0.539	0.902	0.528	0.911	0.517	0.919	0.506	0.926	0.495	0.934
18. Rajgarh			0.431	0.456	0.422	0.451	0.414	0.465	0.405	0.469	0.396	0.472
19. Khandwa			0.255	0.417	0.250	0.422	0.244	0.423	0.239	0.427	0.234	0.430
20. Ujjain			0.706	0.881	0.891	0.890	0.677	0.899	0.662	0.906	0.648	0.912
21. Jhalwar			0.451	0.651	0.442	0.665	0.432	0.671	0.423	0.677	0.414	0.682
Total :			10.095	12.194	9.889	12.041	9.681	12.448	9.475	12.552	9.270	12.6641
IV. <u>Plateau sub-zone with medium to deep black soils :</u>												
1. Nanded			0.42	0.300	0.42	0.309	0.42	0.318	0.42	0.328	0.42	0.338
2. Yeotmal			0.20	0.207	0.20	0.213	0.20	0.220	0.20	0.226	0.20	0.233
3. Wardha			0.35	0.424	0.35	0.437	0.35	0.451	0.35	0.464	0.35	0.478
4. Nagour			0.76	0.609	0.76	0.629	0.76	0.648	0.76	0.668	0.76	0.687
Total :			1.730	1.540	1.730	1.588	1.730	1.637	1.730	1.686	1.730	1.737
Grand Total:			15.975	17.824	15.769	17.850	15.561	18.438	15.355	18.722	15.150	18.991
M.S.			10.002	8.926	9.915	8.843	9.826	9.350	9.738	9.553	9.650	9.752

Table :B: Targets of Area & Production of Rice for VIII FYP - for Western Plateau and Hills  
1 region of Zone-9.

		Production in lakh tonnes. Area in lakh ha.									
Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Production	Area	Production	Area	Production	Area	Production	Area	Production
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
<b>I. Hills Sub-zone :</b>											
1.	Nasik	0.40	0.49	0.40	0.50	0.40	0.52	0.40	0.53	0.40	0.55
2.	Kolhapur	1.00	2.17	1.00	2.24	1.00	2.31	1.00	2.34	1.00	2.45
3.	Satara	0.37	0.66	0.37	0.68	0.37	0.70	0.37	0.72	0.37	0.75
4.	Pune	0.54	0.82	0.54	0.84	0.54	0.87	0.54	0.89	0.54	0.92
5.	Jhabua	0.29	0.103	0.29	0.11	0.29	0.11	0.29	0.113	0.29	0.12
Total :		2.600	4.243	2.600	4.370	2.600	4.510	2.600	4.593	2.600	4.790
<b>II. Scarcity sub-zone :</b>											
1.	Sangli	0.17	0.32	0.17	0.38	0.17	0.34	0.17	0.35	0.17	0.36
2.	Solapur	0.04	0.062	0.04	0.064	0.04	0.07	0.04	0.07	0.04	0.07
3.	Ahmadnagar	0.07	0.103	0.07	0.11	0.07	0.11	0.07	0.113	0.07	0.12
4.	Dhule	0.25	0.20	0.25	0.20	0.25	0.21	0.25	0.22	0.25	0.22
Total :		0.530	0.685	0.530	0.754	0.530	0.73	0.530	0.753	0.530	0.770
<b>III. Plateau sub-zone with relative medium black soils :</b>											
1.	Aurangabad	0.05	0.031	0.05	0.032	0.05	0.033	0.05	0.034	0.05	0.04
2.	Beed	0.07	0.052	0.07	0.053	0.07	0.06	0.07	0.06	0.07	0.06
3.	Jalna	0.04	0.031	0.04	0.032	0.04	0.033	0.04	0.034	0.04	0.04
4.	Parbhani	0.23	0.18	0.23	0.18	0.23	0.19	0.23	0.192	0.23	0.20
5.	Osmanabad	0.23	0.17	0.23	0.17	0.23	0.18	0.23	0.181	0.23	0.19
6.	Latur	0.17	0.113	0.17	0.12	0.17	0.121	0.17	0.13	0.17	0.13

Contd.

Conte.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Buldhana	0.03	0.021	0.03	0.02	0.03	0.022	0.03	0.023	0.03	0.023	0.03	0.023
8. Amraoti	0.13	0.072	0.13	0.08	0.13	0.08	0.13	0.08	0.13	0.08	0.13	0.082
9. Akola	0.08	0.052	0.08	0.053	0.08	0.06	0.08	0.06	0.08	0.06	0.08	0.06
10. Jalgaon	0.09	0.134	0.09	0.14	0.09	0.143	0.09	0.15	0.09	0.15	0.09	0.15
11. Indore	0.003	0.0021	0.003	0.00213	0.003	0.0022	0.003	0.0023	0.003	0.0023	0.003	0.0023
12. Khargaoon	0.18	0.083	0.18	0.09	0.18	0.09	0.18	0.09	0.18	0.09	0.18	0.093
13. Mandsaor	0.004	0.0021	0.004	0.00213	0.004	0.0022	0.004	0.0023	0.004	0.0023	0.004	0.0023
14. Ratlaum	0.05	0.0021	0.05	0.021	0.05	0.022	0.05	0.023	0.05	0.023	0.05	0.023
15. Dhar	0.11	0.062	0.11	0.064	0.11	0.07	0.11	0.07	0.11	0.07	0.11	0.070
16. Devas	0.02	0.0103	0.02	0.011	0.02	0.011	0.02	0.011	0.02	0.011	0.02	0.012
17. Shajapur	0.04	0.021	0.04	0.021	0.04	0.022	0.04	0.023	0.04	0.023	0.04	0.023
18. Rajgarh	0.07	0.041	0.07	0.043	0.07	0.044	0.07	0.05	0.07	0.05	0.07	0.05
19. Khandwa	0.31	0.279	0.31	0.29	0.31	0.30	0.31	0.31	0.31	0.31	0.31	0.32
20. Ujjain	0.002	0.00103	0.002	0.0011	0.002	0.0011	0.002	0.0011	0.002	0.0011	0.002	0.0012
21. Jhalwar	0.009	0.0103	0.009	0.011	0.009	0.011	0.009	0.0113	0.009	0.0113	0.009	0.012
Total :	1.918	1.370	1.918	1.436	1.918	1.517	1.918	1.538	1.918	1.538	1.918	1.584
IV. Plateau sub-zone with medium to deep black soils :												
1. Nanded	0.38	0.31	0.38	0.32	0.38	0.33	0.38	0.34	0.38	0.34	0.38	0.35
2. Yeotmal	0.11	0.072	0.11	0.08	0.11	0.08	0.11	0.08	0.11	0.08	0.11	0.082
3. Wardha	0.09	0.082	0.09	0.09	0.09	0.09	0.09	0.091	0.09	0.091	0.09	0.093
4. Nagpur	0.38	0.41	0.38	0.43	0.38	0.44	0.38	0.45	0.38	0.45	0.38	0.47
Total :	0.960	0.874	0.960	0.920	0.960	0.940	0.960	0.961	0.960	0.961	0.960	0.995
Grand Total :	6.008	7.172	6.008	7.48	6.008	7.697	6.008	7.845	6.008	7.845	6.008	8.139
M.S.	5.199	6.555	5.199	6.804	5.199	6.992	5.199	7.138	5.199	7.138	5.199	7.410

Table :6: Targets of Area and Production of Cotton for VIII FYP-for Western Plateau and Hill region of Zone 9.

Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Production.	Area	Production.	Area	Production.	Area	Production.	Area	Production.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
I. <u>Hills sub-zone</u> :											
1.	Nasik	0.035	0.033	0.035	0.033	0.035	0.034	0.035	0.035	0.035	0.035
2.	Kolhapur	0.005	0.004	0.005	0.004	0.005	0.005	0.005	0.005	0.005	0.0044
3.	Satara	0.048	0.058	0.048	0.059	0.048	0.060	0.048	0.062	0.048	0.063
4.	Pune	0.017	0.023	0.017	0.026	0.017	0.027	0.017	0.027	0.017	0.028
5.	Jhabua	0.302	0.068	0.302	0.070	0.302	0.071	0.302	0.072	0.302	0.074
	Total :	0.4070	0.186	0.407	0.192	0.407	0.197	0.407	0.201	0.407	0.204
II <u>Scarcity sub-zone</u> :											
1.	Sangli	0.017	0.019	0.016	0.019	0.016	0.019	0.016	0.019	0.015	0.018
2.	Solapur	0.084	0.106	0.083	0.106	0.081	0.105	0.079	0.105	0.077	0.104
3.	Ahmadnagar	0.025	0.031	0.025	0.032	0.024	0.031	0.024	0.032	0.023	0.031
4.	Dhule	0.587	0.443	0.575	0.442	0.563	0.441	0.551	0.440	0.539	0.438
	Total :	0.7130	0.599	0.699	0.599	0.684	0.597	0.670	0.596	0.654	0.591
III. <u>Plateau sub-zone with relatively medium black soils</u> :											
1.	Aurangabad	0.532	0.342	0.532	0.348	0.532	0.355	0.532	0.362	0.532	0.369
2.	Beed	0.293	0.185	0.293	0.188	0.293	0.192	0.293	0.195	0.293	0.199
3.	Jalna	1.186	0.837	1.186	0.854	1.186	0.870	1.186	0.887	1.186	0.903
4.	Parbhani	2.316	1.196	2.316	1.220	2.316	1.243	2.316	1.267	2.316	1.290
5.	Osmanabad	0.094	0.052	0.094	0.053	0.094	0.054	0.094	0.055	0.094	0.056
6.	Latur	0.170	0.031	0.170	0.031	0.170	0.032	0.170	0.032	0.170	0.033

Contd.

Contd.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Bulonana	2.756	0.955	2.756	0.973	2.756	0.992	2.756	1.011	2.756	1.030		
8. Amraoti	3.674	1.461	3.674	1.482	3.674	1.518	3.674	1.547	3.674	1.575		
9. Akola	3.566	1.335	3.566	1.361	3.566	1.388	3.566	1.414	3.566	1.440		
10. Jalgaon	1.828	1.205	1.828	1.228	1.828	1.252	1.828	1.275	1.828	1.299		
11. Indore	0.019	0.001	0.019	0.001	0.019	0.001	0.019	0.001	0.019	0.001		
12. Khargaoon	16.96	0.721	16.96	0.735	16.96	0.749	16.96	0.764	16.96	0.778		
13. Mandsaar	0.30	0.016	0.30	0.017	0.30	0.017	0.30	0.017	0.30	0.018		
14. Ratlaum	2.468	0.150	2.468	0.153	2.468	0.156	2.468	0.159	2.468	0.162		
15. Dhar	5.320	0.324	5.320	0.331	5.320	0.337	5.320	0.343	5.320	0.350		
16. Devas	3.939	0.270	3.939	0.276	3.939	0.281	3.939	0.286	3.939	0.292		
17. Shajapur	1.874	0.067	1.874	0.069	1.874	0.070	1.874	0.071	1.874	0.073		
18. Rajgarh	1.911	0.100	1.911	0.102	1.911	0.103	1.911	0.106	1.911	0.108		
19. Khandwa	13.88	0.576	13.88	0.588	13.88	0.599	13.88	0.610	13.88	0.622		
20. Ujjain	1.128	0.053	1.128	0.054	1.128	0.055	1.128	0.056	1.128	0.057		
21. Jhalwar	0.086	0.038	0.086	0.038	0.086	0.039	0.086	0.040	0.086	0.041		
Total :	64.300	16.198	64.300	10.109	64.300	10.303	64.300	10.498	64.300	10.676		
IV. Plateau sub-zone with medium to deep black soils :												
1. Nanded	2.133	1.220	2.133	1.245	2.133	1.268	2.133	1.292	2.133	1.316		
2. Yeotmal	4.284	1.971	4.284	2.009	4.284	2.048	4.284	2.087	4.284	2.125		
3. Washdha	1.744	1.055	1.744	1.075	1.744	1.096	1.744	1.116	1.744	1.137		
4. Nagpur	0.822	0.413	0.822	0.421	0.822	0.429	0.822	0.437	0.822	0.446		
Total :	8.983	4.659	8.983	4.750	8.983	4.841	8.983	4.932	8.983	5.024		
Grand Total :	74.403	15.642	74.389	15.656	74.374	15.938	74.360	16.227	74.344	16.495		
M.S.	26.204	13.259	26.190	13.216	26.187	13.460	26.173	13.702	26.157	13.940		

Table :7: Targets of Area and Production of Groundnut for VIII FYP for Western Plateau and Hills region of Zone 9. 51  
00

Sr. No.	District.	1990-91		1991-92		1992-93		1993-94		1994-95.	
		Area	Production.	Area	Production.	Area	Production.	Area	Production.	Area	Production.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Area in lakh ha. Production in lakh tonnes.											
<u>I. Hills sub-zone :</u>											
1.	Nasik	0.503	0.251	0.503	0.262	0.503	0.272	0.503	0.283	0.503	0.294
2.	Kolhapur	0.556	0.816	0.556	0.851	0.556	0.886	0.556	0.922	0.556	0.970
3.	Satara	0.626	0.654	0.626	0.955	0.626	0.994	0.626	1.034	0.626	1.073
4.	Pune	0.360	0.403	0.360	0.421	0.360	0.438	0.360	0.455	0.360	0.473
5.	Jhabua	0.187	0.078	0.187	0.082	0.187	0.085	0.187	0.089	0.187	0.092
	Total :	2.232	2.202	2.232	2.571	2.232	2.675	2.232	2.783	2.232	2.902
<u>II. Scarcity sub-zone :</u>											
1.	Sangli	0.364	0.433	0.365	0.452	0.365	0.471	0.365	0.490	0.366	0.512
2.	Solapur	0.147	0.122	0.148	0.128	0.150	0.133	0.152	0.146	0.154	0.152
3.	Ahmadnagar	0.136	0.124	0.136	0.130	0.137	0.135	0.137	0.140	0.138	0.146
4.	Dhule	0.921	0.599	0.933	0.633	0.945	0.669	0.957	0.703	0.969	0.739
	Total :	1.568	1.278	1.582	1.343	1.597	1.408	1.611	1.479	1.627	1.549
<u>III. Plateau sub-zone with relatively medium black soils :</u>											
1.	Aurangabad	0.140	0.071	0.140	0.074	0.140	0.077	0.140	0.080	0.140	0.083
2.	Beed	0.106	0.054	0.106	0.057	0.106	0.059	0.106	0.061	0.106	0.064
3.	Jalna	0.089	0.062	0.089	0.064	0.089	0.067	0.089	0.070	0.089	0.072
4.	Parbhani	0.083	0.056	0.083	0.059	0.083	0.061	0.083	0.064	0.083	0.066
5.	Osmanabad	0.166	0.109	0.166	0.113	0.166	0.118	0.166	0.123	0.166	0.127
6.	Latur	0.322	0.166	0.322	0.173	0.322	0.180	0.322	0.188	0.322	0.195

Contd.

Contd.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Buldhana	0.084	0.083	0.084	0.086	0.084	0.090	0.084	0.093	0.084	0.093	0.084	0.097
8. Amraoti	0.229	0.181	0.229	0.189	0.229	0.196	0.229	0.204	0.229	0.204	0.229	0.212
9. Akola	0.124	0.079	0.124	0.083	0.124	0.086	0.124	0.090	0.124	0.090	0.124	0.093
10. Jalgaon	0.650	0.415	0.650	0.433	0.650	0.451	0.650	0.468	0.650	0.468	0.650	0.486
11. Indore	0.011	0.006	0.011	0.007	0.011	0.007	0.011	0.007	0.011	0.007	0.011	0.007
12. KHargaon	0.489	0.030	0.489	0.032	0.489	0.033	0.489	0.034	0.489	0.034	0.489	0.036
13. Mand'saur	0.414	0.030	0.414	0.032	0.414	0.033	0.414	0.034	0.414	0.034	0.414	0.036
14. Ratlaum	0.052	0.032	0.052	0.034	0.052	0.035	0.052	0.037	0.052	0.037	0.052	0.038
15. Dhar	0.292	0.125	0.292	0.131	0.292	0.136	0.292	0.142	0.292	0.142	0.292	0.147
16. Devas	0.078	0.050	0.078	0.052	0.078	0.054	0.078	0.057	0.078	0.057	0.078	0.059
17. Shajapur	0.227	0.127	0.227	0.131	0.227	0.138	0.227	0.144	0.227	0.144	0.227	0.147
18. Rajgarh	0.204	0.099	0.204	0.104	0.204	0.108	0.204	0.112	0.204	0.112	0.204	0.116
19. Khandwa	0.182	0.094	0.182	0.098	0.182	0.102	0.182	0.106	0.182	0.106	0.182	0.110
20. Ujjain	0.090	0.063	0.090	0.065	0.090	0.068	0.090	0.071	0.090	0.071	0.090	0.074
21. Jhalwar	0.083	0.062	0.083	0.064	0.083	0.067	0.083	0.070	0.083	0.070	0.083	0.072
Total :	4.115	1.994	4.115	2.081	4.115	2.166	4.115	2.255	4.115	2.255	4.115	2.337
IV. <u>Plteau sub-zone with medium to deep black soils :</u>												
1. Nanded	0.061	0.031	0.061	0.033	0.061	0.034	0.061	0.035	0.061	0.035	0.061	0.034
2. Yeotmal	0.158	0.061	0.158	0.063	0.158	0.066	0.158	0.068	0.158	0.068	0.158	0.071
3. Wardha	0.117	0.145	0.117	0.152	0.117	0.158	0.117	0.164	0.117	0.164	0.117	0.170
4. Nagpur	0.150	0.108	0.150	0.112	0.150	0.117	0.150	0.122	0.150	0.122	0.150	0.126
Total :	0.486	0.345	0.486	0.360	0.486	0.375	0.486	0.389	0.486	0.389	0.486	0.404
Grand Total:	8.401	5.819	8.415	6.355	8.430	6.624	8.440	6.906	8.460	6.906	8.460	7.192
M.S.	6.092	5.023	6.106	5.523	6.121	5.758	6.135	6.003	6.151	6.003	6.151	6.258

Table :8: Targets of Area and Production of Arhar for VIII FYP for Western Plateau and Hills region of Zone 9,

Sr. No.	District.	1990-91		1991-92		1992-93		1993-94		1994-95.	
		Area	Production.	Area	Production.	Area	Production.	Area	Production.	Area	Production.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
<b>I. Hills sub-zone :</b>											
1.	Nasik	0.054	0.045	0.054	0.046	0.054	0.047	0.054	0.048	0.054	0.050
2.	Kolhapur	0.060	0.052	0.060	0.054	0.060	0.055	0.060	0.056	0.060	0.057
3.	Satara	0.075	0.047	0.075	0.050	0.075	0.052	0.075	0.053	0.075	0.054
4.	Pune	0.061	0.039	0.061	0.040	0.061	0.041	0.061	0.042	0.061	0.043
5.	Jhabua	0.073	0.036	0.073	0.037	0.073	0.038	0.073	0.039	0.073	0.039
Total :		0.323	0.221	0.323	0.227	0.323	0.233	0.323	0.238	0.323	0.243
<b>II. Scarcity sub-zone :</b>											
1.	Sangli	0.103	0.068	0.103	0.069	0.103	0.071	0.103	0.073	0.103	0.074
2.	Solapur	0.338	0.140	0.338	0.144	0.338	0.147	0.338	0.151	0.338	0.154
3.	Ahmadnagar	0.112	0.059	0.112	0.061	0.112	0.062	0.112	0.064	0.112	0.065
4.	Dhule	0.110	0.086	0.110	0.088	0.110	0.090	0.110	0.092	0.110	0.095
Total :		0.663	0.354	0.663	0.362	0.663	0.370	0.663	0.380	0.663	0.388
<b>III. Plateau sub-zone with relatively medium black soils :</b>											
1.	Aurangabad	0.260	0.106	0.260	0.108	0.260	0.111	0.260	0.113	0.260	0.116
2.	Beed	0.351	0.183	0.351	0.188	0.351	0.192	0.351	0.197	0.351	0.201
3.	Jalna	0.277	0.124	0.277	0.127	0.277	0.130	0.277	0.133	0.277	0.136
4.	Parbhani	0.509	0.316	0.509	0.323	0.509	0.331	0.509	0.339	0.509	0.347
5.	Osmanabad.	0.693	0.342	0.693	0.351	0.693	0.359	0.693	0.367	0.693	0.376
6.	Latur	0.358	0.216	0.358	0.222	0.358	0.227	0.358	0.232	0.358	0.237

Contd.



Contd.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Buldhana		0.464	0.268	0.464	0.274	0.464	0.281	0.464	0.287	0.464	0.294
8. Amraoti		0.576	0.435	0.576	0.445	0.576	0.456	0.576	0.466	0.576	0.477
9. Akola		0.585	0.450	0.585	0.461	0.585	0.472	0.585	0.483	0.585	0.494
10. Jalgaon		0.135	0.103	0.135	0.105	0.135	0.108	0.135	0.110	0.135	0.113
11. Indore		0.110	0.076	0.110	0.078	0.110	0.080	0.110	0.081	0.110	0.083
12. Khargaon		0.220	0.111	0.220	0.113	0.220	0.116	0.220	0.119	0.220	0.122
13. Mandasaur		0.071	0.052	0.071	0.054	0.071	0.055	0.071	0.056	0.071	0.057
14. Ratlaum		0.043	0.034	0.043	0.035	0.043	0.0354	0.043	0.036	0.043	0.037
15. Dhar		0.088	0.050	0.088	0.051	0.088	0.053	0.088	0.054	0.088	0.055
16. Devas		0.141	0.099	0.141	0.102	0.141	0.104	0.141	0.107	0.141	0.109
17. Shajapur		0.126	0.091	0.126	0.093	0.126	0.096	0.126	0.098	0.126	0.100
18. Rajgarh		0.277	0.176	0.277	0.181	0.277	0.185	0.277	0.189	0.277	0.194
19. Khandwa		0.163	0.170	0.163	0.174	0.163	0.178	0.163	0.183	0.163	0.187
20. Ujjain		0.114	0.084	0.114	0.086	0.114	0.088	0.114	0.090	0.114	0.092
21. Jhalwar		0.041	0.0072	0.041	0.0074	0.041	0.008	0.041	0.0077	0.041	0.008
Total :		5.602	3.493	5.602	3.578	5.602	3.665	5.602	3.757	5.602	3.835
IV. Plateau sub-zone with medium to deep black soils :											
1. Nanded		0.409	0.214	0.409	0.219	0.409	0.225	0.409	0.230	0.409	0.235
2. Yeotmal		0.614	0.532	0.614	0.545	0.614	0.558	0.614	0.571	0.614	0.584
3. Wardha		0.335	0.424	0.335	0.435	0.335	0.445	0.335	0.455	0.335	0.466
4. Nagpur		0.459	0.278	0.459	0.285	0.459	0.291	0.459	0.298	0.459	0.305
Total :		1.817	1.448	1.817	1.484	1.817	1.519	1.817	1.554	1.817	1.590
Grand Total :		8.405	5.515	8.405	5.651	8.405	5.787	8.405	5.929	8.405	6.056
M.S.		6.938	3.543	6.938	4.640	6.938	4.751	6.938	4.869	6.938	4.973

Table :9: Targets of Area and Production of Gram for VIII FYP for Western Plateau and Hills region zone 9.

Area in lakh ha.  
production in lakh tonnes.

Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Production.	Area	Production.	Area	Production.	Area	Production.	Area	Production.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
<b>I. Hills sub-zone :</b>											
1.	Nasik	0.284	0.123	0.284	0.126	0.284	0.129	0.284	0.132	0.284	0.135
2.	Kolhapur	0.556	0.801	0.556	0.820	0.556	0.840	0.556	0.859	0.556	0.879
3.	Satara	0.626	0.898	0.626	0.920	0.626	0.942	0.626	0.964	0.626	0.986
4.	Pune	0.359	0.396	0.359	0.405	0.359	0.415	0.359	0.425	0.359	0.434
5.	Jhabua	0.322	0.164	0.322	0.168	0.322	0.172	0.322	0.176	0.322	0.180
	Total :	1.847	2.382	1.847	2.439	1.847	2.498	1.847	2.556	1.847	2.614
<b>II. Scarcity sub-zone :</b>											
1.	Sangli	0.193	0.074	0.193	0.076	0.193	0.077	0.193	0.079	0.193	0.081
2.	Solapur	0.323	0.106	0.323	0.108	0.323	0.111	0.323	0.113	0.323	0.116
3.	Ahmadnagar	0.265	0.128	0.265	0.131	0.265	0.134	0.265	0.138	0.265	0.141
4.	Dhule	0.121	0.059	0.121	0.061	0.121	0.062	0.121	0.064	0.121	0.065
	Total :	0.902	0.367	0.902	0.376	0.902	0.384	0.902	0.394	0.902	0.403
<b>III. Plateau sub-zone with relatively medium black soils :</b>											
1.	Aurangabad	0.274	0.073	0.274	0.075	0.274	0.076	0.274	0.078	0.274	0.080
2.	Beed	0.296	0.100	0.296	0.103	0.296	0.105	0.296	0.108	0.296	0.110
3.	Jalna	0.151	0.054	0.151	0.056	0.151	0.057	0.151	0.058	0.151	0.060
4.	Parbhani	0.355	0.110	0.355	0.112	0.355	0.115	0.355	0.118	0.355	0.120
5.	Osmanabad	0.396	0.186	0.396	0.190	0.396	0.194	0.396	0.199	0.396	0.203
6.	Latur	0.264	0.106	0.264	0.108	0.264	0.111	0.264	0.113	0.264	0.116

Contd.

Contd.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Bulchana		0.099	0.044	0.099	0.045	0.099	0.046	0.099	0.047	0.099	0.048
8. Amranti		0.130	0.056	0.130	0.058	0.130	0.059	0.130	0.061	0.130	0.062
9. Akola		0.155	0.084	0.155	0.086	0.155	0.088	0.155	0.090	0.155	0.092
10. Jalgaon		0.116	0.068	0.116	0.069	0.116	0.071	0.116	0.073	0.116	0.074
11. Indore		0.541	0.341	0.541	0.350	0.541	0.352	0.541	0.366	0.541	0.375
12. Khargaon		0.120	0.062	0.120	0.063	0.120	0.065	0.120	0.066	0.120	0.068
13. Mandasaur		1.535	1.057	1.535	1.083	1.535	1.108	1.535	1.134	1.535	1.160
14. Ratlaum		0.716	0.434	0.716	0.444	0.716	0.455	0.716	0.465	0.716	0.476
15. Dhar		0.651	0.316	0.651	0.323	0.651	0.331	0.651	0.339	0.651	0.347
16. Devas		0.430	0.344	0.430	0.353	0.430	0.361	0.430	0.370	0.430	0.376
17. Shajapur		0.749	0.547	0.749	0.561	0.749	0.574	0.749	0.587	0.749	0.601
18. Rajgarh		0.502	0.390	0.502	0.400	0.502	0.410	0.502	0.419	0.502	0.429
19. Khandwa		0.081	0.056	0.081	0.058	0.081	0.059	0.081	0.061	0.081	0.062
20. Ujjain		1.009	0.547	1.009	0.561	1.009	0.574	1.009	0.587	1.009	0.601
21. Jhalwar		0.554	0.426	0.554	0.427	0.554	0.447	0.554	0.458	0.554	0.468
Total :		9.124	5.401	9.124	5.535	9.124	5.664	9.124	5.797	9.124	5.929
IV. Plateau sub-zone with medium to deep black soils :											
1. Nanded		0.174	0.050	0.174	0.051	0.174	0.053	0.174	0.054	0.174	0.055
2. Yeotmal		0.057	0.021	0.057	0.021	0.057	0.022	0.057	0.022	0.057	0.023
3. Wardha		0.048	0.015	0.048	0.016	0.048	0.016	0.048	0.017	0.048	0.017
4. Nagpur		0.160	0.060	0.160	0.062	0.160	0.063	0.160	0.065	0.160	0.066
Total :		0.439	0.146	0.439	0.150	0.439	0.154	0.439	0.158	0.439	0.161
Grand Total :		12.312	8.296	12.312	8.500	12.312	8.700	12.312	8.905	12.312	9.105
M.S.		5.102	3.612	5.102	3.699	5.102	3.786	5.102	3.877	5.102	3.963

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Table :10: Targets of Area and Production of Sugarcane for VIII FYP for Western Plateau and Hills region for zone 9.

Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Production.	Area	Production.	Area	Production.	Area	Production.	Area	Production.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
I. <u>Hills sub-zone :</u>											
1.	Nasik	0.258	2.465	0.258	2.549	0.258	2.632	0.258	2.715	0.258	2.799
2.	Kolhapur	0.576	5.461	0.576	5.645	0.576	5.830	0.576	6.015	0.576	6.199
3.	Satara	0.264	2.207	0.264	2.281	0.264	2.356	0.264	2.430	0.264	2.505
4.	Pune	0.349	3.043	0.349	3.146	0.349	3.249	0.349	3.352	0.349	3.455
5.	Jhabua	0.001	0.0041	0.001	0.0043	0.001	0.0044	0.001	0.005	0.001	0.005
Total :		1.448	13.180	1.448	13.625	1.448	14.071	1.448	14.517	1.448	14.963
II. <u>Scarcity Sub-zone :</u>											
1.	Sangli	0.297	2.582	0.297	2.670	0.297	2.757	0.297	2.844	0.297	2.932
2.	Solapur	0.288	2.563	0.288	2.649	0.288	2.736	0.288	2.823	0.288	2.909
3.	Ahmadnagar	0.740	6.110	0.740	6.316	0.740	6.523	0.740	6.729	0.740	6.936
4.	Dhule	0.117	0.914	0.117	0.945	0.117	0.976	0.117	1.007	0.117	1.038
Total :		1.442	12.169	1.442	12.580	1.442	12.992	1.442	13.403	1.442	13.815
III. <u>Plateau sub-zone with relatively medium black soils :</u>											
1.	Aurangabad	0.160	1.348	0.160	1.393	0.160	1.439	0.160	1.484	0.160	1.530
2.	Beed	0.089	0.633	0.089	0.655	0.089	0.676	0.089	0.698	0.089	0.719
3.	Jalna	0.064	0.493	0.064	0.509	0.064	0.526	0.064	0.543	0.064	0.559
4.	Parbhani	0.057	0.293	0.057	0.303	0.057	0.313	0.057	0.323	0.057	0.333
5.	Osmanabad	0.129	0.733	0.129	0.758	0.129	0.782	0.129	0.806	0.129	0.832
6.	Latur	0.045	0.267	0.045	0.276	0.045	0.285	0.045	0.294	0.045	0.303

Contd.

Contd.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Buldhana			0.014	0.096	0.014	0.100	0.014	0.103	0.014	0.106	0.014	0.109
8. Amraoti			0.004	0.035	0.004	0.036	0.004	0.038	0.004	0.039	0.004	0.040
9. Akola			0.004	0.026	0.004	0.027	0.004	0.028	0.004	0.028	0.004	0.029
10. Jalgaon			0.107	0.807	0.107	0.835	0.107	0.862	0.107	0.889	0.107	0.917
11. Indore			0.024	0.076	0.024	0.078	0.024	0.081	0.024	0.083	0.024	0.086
12. Khargaoon			0.016	0.042	0.016	0.044	0.016	0.045	0.016	0.047	0.016	0.048
13. Mandsaar			0.009	0.037	0.009	0.039	0.009	0.040	0.009	0.041	0.009	0.042
14. Ratlaum			0.012	0.052	0.012	0.054	0.012	0.055	0.012	0.057	0.012	0.059
15. Dhar			0.010	0.019	0.010	0.019	0.010	0.020	0.010	0.021	0.010	0.021
16. Devas			0.040	0.080	0.040	0.082	0.040	0.085	0.040	0.088	0.040	0.090
17. Shajapur			0.017	0.036	0.017	0.037	0.017	0.039	0.017	0.040	0.017	0.041
18. Rajgarh			0.012	0.029	0.012	0.030	0.012	0.031	0.012	0.032	0.012	0.033
19. Khandwa			0.008	0.034	0.008	0.035	0.008	0.036	0.008	0.038	0.008	0.039
20. Ujjain			0.022	0.049	0.022	0.050	0.022	0.052	0.022	0.054	0.022	0.055
21. Jhalwar			0.011	0.450	0.011	0.465	0.011	0.481	0.011	0.496	0.011	0.511
Total :			0.854	5.635	0.854	5.825	0.854	6.017	0.854	6.208	0.854	6.393
IV. Plateau sub-zone with medium to deep black soils :												
1. Nanded			0.085	0.500	0.085	0.517	0.085	0.534	0.085	0.551	0.085	0.568
2. Yeotmal			0.017	0.122	0.017	0.126	0.017	0.130	0.017	0.135	0.017	0.139
3. Wardha			0.002	0.016	0.002	0.0161	0.002	0.017	0.002	0.0171	0.002	0.018
4. Nagpur			0.002	0.016	0.002	0.0161	0.002	0.017	0.002	0.0171	0.002	0.018
Total :			0.106	0.650	0.106	0.675	0.106	0.698	0.106	0.720	0.106	0.743
Grand Total :			3.850	31.634	3.850	32.706	3.850	33.778	3.850	34.848	3.850	35.914
M.S.			3.668	30.726	3.668	31.768	3.668	32.813	3.668	33.846	3.668	34.892

Table :11: Districtwise targets of Annual fertilizer requirement in tonnes for VIII<sup>th</sup> FYP for zone 9.

Sr. No.	District	1990-91			1991-92			1992-93		
		N	P	K	N	P	K	N	P	K
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
<b>I. Hills sub-zone :</b>										
1.	Nasik	3033.0	1330.0	894.5	3457.6	1519.6	1019.7	3941.7	1732.3	1162.5
2.	Kolhapur	6927.3	3184.7	3120.7	7897.1	3630.5	3557.6	9002.7	4138.8	4055.6
3.	Satara	1893.2	652.5	639.8	2518.2	743.8	729.3	2450.4	847.9	831.4
4.	Pune	5830.2	2977.6	2552.2	6646.4	3394.4	2909.5	7576.9	3869.6	3316.8
5.	Jhabua	271.8	70.0	15.4	309.8	79.8	17.5	353.2	90.9	20.0
	Total :	17955.5	8217.1	7222.6	20829.1	9368.1	8233.6	23334.9	10679.5	9386.3
<b>II. Scarcity sub-zone :</b>										
1.	Sangli	2362.7	755.7	858.8	2693.4	861.5	979.0	3070.5	982.1	1116.1
2.	Solapur	3111.5	1398.5	842.2	3547.1	1594.3	960.1	4043.7	1817.5	1094.5
3.	Ahmadnagar	3624.4	1613.2	1147.8	4131.8	1839.0	1308.5	4710.2	2096.5	1491.6
4.	Dhule	3422.3	1279.2	630.5	3901.4	1458.2	718.7	4447.6	1662.4	819.3
	Total :	12520.9	5046.6	3479.3	14273.7	5753.0	3966.3	16272.0	6558.7	4521.5
<b>III. Plateau sub-zone with relatively medium black soils :</b>										
1.	Aurangabad	2289.7	931.9	485.4	2610.2	1032.3	553.3	2975.7	1211.1	630.8
2.	Beed	984.0	494.3	273.7	1121.7	563.5	312.0	1278.8	642.4	355.7
3.	Jalna	2091.8	763.3	613.5	2384.6	870.1	699.4	2718.5	991.9	757.3
4.	Parbhani	1990.9	689.8	501.1	2269.6	786.3	571.2	2587.3	896.4	651.2
5.	Osmanabad	1399.5	533.4	344.0	1595.4	608.0	392.1	1818.8	693.2	447.0
6.	Latur	--	--	--	--	--	--	--	--	--

Contd.

## Contd. (Fert.)

Sr. No.	District.	1993-94			1994-95		
		N	P	K	N	P	K
1.	2.	12.	13.	14.	15.	16.	17.
<u>I. Hills sub-zone :</u>							
1.	Nasik	4493.5	1974.9	1325.2	5122.6	2251.3	1510.7
2.	Kolhapur	10263.1	4718.2	4623.4	11699.9	5378.8	5270.7
3.	Satara	2804.8	966.8	947.9	3197.5	1102.0	1080.6
4.	Pune	8637.7	4411.4	3781.2	9846.9	5029.0	4310.5
5.	Jhabua	402.6	103.7	22.8	459.0	118.2	26.0
	Total :	26601.2	12175.0	10700.5	30325.9	13879.5	12198.5
<u>II. Scarcity sub-zone :</u>							
1.	Sangli	13500.4	1119.6	1272.3	3990.5	1276.3	1450.4
2.	Solapur	4609.8	2071.9	1247.7	5255.2	2362.0	1422.4
3.	Ahmadnagar	5369.7	2390.0	1700.5	6121.4	2724.6	1938.5
4.	Dhule	5070.2	1895.2	934.4	5780.1	2160.5	1064.8
	Total :	18550.1	7476.7	5154.6	21147.2	8523.4	5876.1
<u>III. Plateau sub-zone with relatively medium black soils :</u>							
1.	Aurangabad	3392.3	1380.6	719.1	3867.2	1573.9	819.8
2.	Beed	1457.8	732.3	405.5	1661.9	834.8	462.2
3.	Jalna	3099.1	1130.8	908.9	3532.9	1289.1	1036.1
4.	Parbhani	2949.6	1021.9	742.4	3362.5	1165.0	846.3
5.	Osmanabad	2073.4	790.2	509.6	2363.7	900.9	581.0
6.	Latur	-	-	-	-	-	-

Contd.

Contd. (Fert.)

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
7. Buldhana	1331.5	1520.9	1615.4	3797.9	1733.8	1841.5	4329.6	1976.5	2099.3	
8. Amraoti	2660.1	1134.8	743.3	3032.5	1293.6	847.3	3457.0	1474.6	965.9	
9. Akola	2922.1	906.8	890.7	3331.1	1033.7	1015.4	3797.5	1178.4	1357.5	
10. Jalgaon	6936.2	2349.5	2678.3	7907.2	2678.4	3053.2	9014.2	3053.4	3480.7	
11. Indore	902.3	856.9	239.5	1028.6	976.8	273.0	1172.6	1113.6	311.2	
12. Khargaoon	1951.7	724.4	313.4	2224.9	825.8	357.2	2536.4	941.4	407.2	
13. Mandsaur	2003.7	1130.7	287.2	2284.2	1288.9	327.4	2604.0	1569.4	373.2	
14. Ratlam	1624.9	623.0	175.4	1852.3	710.2	199.9	2111.6	809.6	227.9	
15. Dhar	1773.3	699.5	206.9	2021.5	797.4	235.8	2304.5	909.9	268.8	
16. Devas	1081.6	783.6	193.3	1233.0	893.3	220.3	1405.6	1011.3	251.2	
17. Shajapur	605.4	577.8	106.0	690.1	658.7	120.8	786.7	750.9	137.7	
18. Rajgarh	253.9	169.2	30.5	289.4	102.8	34.7	329.9	219.9	39.6	
19. Khandwa	1088.0	304.5	423.1	1240.3	347.1	482.3	1413.9	395.7	549.8	
20. Ujjain	1414.2	1145.2	312.9	1612.1	1305.5	356.7	1837.9	1488.3	406.6	
21. Jhalwar	440.5	263.9	37.3	502.1	300.8	42.5	572.4	342.9	48.4	
Total :	37745.0	16603.4	10470.9	43028.7	18807.0	11936.0	49053.0	21576.9	13607.0	
IV. <u>Plateau sub-zone with medium to deep black soils :</u>										
1. Nanded	1618.3	658.3	448.6	2074.0	750.4	511.4	2364.3	855.5	583.0	
2. Yeotmal	1789.0	1347.7	640.5	2039.4	1536.3	730.1	2324.9	1751.4	832.4	
3. Wardha	2679.3	1322.8	424.8	3054.4	1507.9	484.2	3482.0	1719.1	552.0	
4. Nagpur	4019.6	1804.1	879.0	4582.3	2056.6	1002.0	5223.8	2344.6	1142.3	
Total :	10307.2	5132.9	2392.9	11750.1	5851.2	2727.3	13395.0	6670.6	3109.7	
Grand Total:	78529.0	35000.0	23565.0	89882.0	39779.0	26864.0	102055.0	45485.0	30624.0	
M.S.	65118.0	27651.0	21224.0	74593.0	31492.0	24195.0	84626.0	35936.0	27583.0	

Conte.



Contd. (Fert.)

	12.	13.	14.	15.	16.	17.
7. Buldhana	4935.7	2253.2	2393.2	5626.7	2568.7	2728.3
8. Amravati	3941.0	1681.2	1101.2	4492.8	1916.6	1255.4
9. Akola	4329.2	1343.4	1319.6	4935.3	1531.5	1504.3
10. Jalgaon	10276.2	3480.8	3968.0	11714.9	3968.2	4523.5
11. Indore	1336.7	1269.5	354.8	1523.9	1447.2	404.5
12. Kharggaon	2891.5	1073.2	464.3	3296.3	1223.4	529.3
13. Mandsaar	2968.5	1675.1	425.5	3384.1	1009.7	485.0
14. Ratlaam	2407.3	923.0	259.8	2744.3	1053.2	296.2
15. Dhar	2627.2	1036.3	306.5	2995.0	1181.4	349.4
16. Devas	1602.4	1160.9	286.3	1826.8	1323.4	326.4
17. Shajapur	896.9	856.0	157.0	1022.5	975.8	179.0
18. Rajgarh	376.1	250.6	45.1	528.8	285.7	51.5
19. Khandwa	1611.9	451.1	626.8	1837.5	514.3	714.6
20. Ujjain	2095.2	1696.6	463.5	2388.5	1934.2	528.4
21. Jhalwar	652.6	390.9	55.2	743.9	445.7	63.0
Total :	55920.6	24597.6	15512.3	72949.5	42041.7	31684.2
<u>IV. Plateau sub-zone with medium to deep black soils :</u>						
1. Nanded	2695.3	975.3	664.6	3072.7	1111.8	757.6
2. Yeotmal	2650.4	1996.6	948.9	3021.5	2276.2	1081.7
3. Wardha	3969.5	1959.7	629.3	4525.2	2234.1	717.4
4. Nagpur	5955.2	2672.8	1302.2	6788.9	3047.0	1484.6
Total :	15270.4	7604.4	3545.0	17408.3	8669.1	4041.3
Grand Total:	116342.0	51854.0	34912.0	141831.0	73113.0	53800.0
M.S.	96473.0	40967.0	31445.0	119180.0	60702.0	49847.0

Table :12: Targets of certified seed requirement of Kharif Jowar for VIII FYP for Western Plateau and Hills region Zone 9.

Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
I. <u>Hills sub-zone :</u>											
1.	Nasik	0.31	0.017	0.31	0.018	0.31	0.019	0.31	0.020	0.31	0.021
2.	Kolhapur	0.43	0.239	0.43	0.026	0.43	0.026	0.43	0.028	0.43	0.029
3.	Satara	0.91	0.051	0.91	0.053	0.91	0.056	0.91	0.059	0.91	0.061
4.	Pune	0.25	0.014	0.25	0.015	0.25	0.015	0.25	0.016	0.25	0.017
5.	Jhabua	0.33	0.018	0.33	0.019	0.33	0.020	0.33	0.021	0.33	0.022
	Total :	2.23	0.124	2.23	0.130	2.23	0.137	2.23	0.144	2.23	0.150
II. <u>Scarcity sub-zone :</u>											
1.	Sangli	1.16	0.064	1.16	0.068	1.16	0.071	1.16	0.075	1.16	0.078
2.	Solapur	0.08	0.003	0.08	0.005	0.08	0.005	0.08	0.005	0.08	0.005
3.	Ahmadnagar	0.16	0.007	0.16	0.009	0.16	0.010	0.16	0.010	0.16	0.011
4.	Dhule	0.93	0.052	0.93	0.054	0.93	0.057	0.93	0.060	0.93	0.063
	Total :	2.33	0.129	2.33	0.136	2.33	0.143	2.33	0.150	2.33	0.157
III. <u>Plateau sub-zone with relatively medium black soils :</u>											
1.	Aurangabad	0.56	0.031	0.56	0.033	0.56	0.034	0.56	0.036	0.56	0.038
2.	Beed	1.20	0.067	1.20	0.070	1.20	0.074	1.20	0.077	1.20	0.080
3.	Jalna	0.71	0.039	0.71	0.042	0.71	0.044	0.71	0.046	0.71	0.048
4.	Parbhani	1.77	0.098	1.77	0.104	1.77	0.109	1.77	0.114	1.77	0.119
5.	Osmanabad	1.78	0.099	1.78	0.104	1.78	0.109	1.78	0.115	1.78	0.120
6.	Latur	1.46	0.081	1.46	0.085	1.46	0.090	1.46	0.094	1.46	0.099

Contd.

Contd. (Fert.)

	12.	13.	14.	15.	16.	17.
7. Solikhana	4935.7	2253.2	2393.2	5626.7	2568.7	2728.3
8. Amravati	3941.0	1681.2	1101.2	4492.8	1916.6	1255.4
9. Akola	4329.2	1343.4	1319.6	4935.3	1531.5	1504.3
10. Jalgaon	10276.2	3480.8	3968.0	11714.9	3968.2	4523.5
11. Indore	1336.7	1269.5	354.8	1523.9	1447.2	404.5
12. Khargaoon	2891.5	1073.2	464.3	3296.3	1223.4	529.3
13. Mandasaur	2968.5	1675.1	425.5	3384.1	1009.7	485.0
14. Ratlaum	2407.3	923.0	259.8	2744.3	1053.2	296.2
15. Dhar	2627.2	1036.3	306.5	2995.0	1181.4	349.4
16. Devas	1602.4	1160.9	286.3	1826.8	1323.4	326.4
17. Shajapur	896.9	856.0	157.0	1022.5	975.8	179.0
18. Rajgarh	376.1	250.6	45.1	528.8	285.7	51.5
19. Khandwa	1611.9	451.1	626.8	1837.5	514.3	714.6
20. Ujjain	2095.2	1696.6	463.5	2388.5	1934.2	528.4
21. Jhalwar	652.6	390.9	55.2	743.9	445.7	63.0
Total :	55920.6	24597.6	15512.3	72949.5	42041.7	31684.2
<u>IV. Plateau sub-zone with medium to deep black soils :</u>						
1. Nanded	2695.3	975.3	664.6	3072.7	1111.8	757.6
2. Yeotmal	2650.4	1996.6	948.9	3021.5	2276.2	1081.7
3. Wardha	3969.5	1959.7	629.3	4525.2	2234.1	717.4
4. Nagpur	5955.2	2672.8	1302.2	6788.9	3047.0	1484.6
Total :	15270.4	7604.4	3545.0	17408.3	8669.1	4041.3
Grand Total:	116342.0	51854.0	34912.0	141831.0	73113.0	53800.0
M.S.	96473.0	40967.0	31445.0	119180.0	60702.0	49847.0

Table :12: Targets of certified seed requirement of Kharif Jowar for VIII FYP for Western Plateau and Hills region Zone 9.

Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
I. <u>Hills sub-zone :</u>											
1.	Nasik	0.31	0.017	0.31	0.018	0.31	0.019	0.31	0.020	0.31	0.021
2.	Kolhapur	0.43	0.239	0.43	0.026	0.43	0.026	0.43	0.028	0.43	0.029
3.	Satara	0.91	0.051	0.91	0.053	0.91	0.056	0.91	0.059	0.91	0.061
4.	Pune	0.25	0.014	0.25	0.015	0.25	0.015	0.25	0.016	0.25	0.017
5.	Jhabua	0.33	0.018	0.33	0.019	0.33	0.020	0.33	0.021	0.33	0.022
Total :		2.23	0.124	2.23	0.130	2.23	0.137	2.23	0.144	2.23	0.150
II. <u>Scarcity sub-zone :</u>											
1.	Sangli	1.16	0.064	1.16	0.068	1.16	0.071	1.16	0.075	1.16	0.078
2.	Solapur	0.08	0.003	0.08	0.005	0.08	0.005	0.08	0.005	0.08	0.005
3.	Ahmadnagar	0.16	0.007	0.16	0.009	0.16	0.010	0.16	0.010	0.16	0.011
4.	Dhule	0.93	0.052	0.93	0.054	0.93	0.057	0.93	0.060	0.93	0.063
Total :		2.33	0.129	2.33	0.136	2.33	0.143	2.33	0.150	2.33	0.157
III. <u>Plateau sub-zone with relatively medium black soils :</u>											
1.	Aurangabad	0.56	0.031	0.56	0.033	0.56	0.034	0.56	0.036	0.56	0.038
2.	Beed	1.20	0.067	1.20	0.070	1.20	0.074	1.20	0.077	1.20	0.080
3.	Jalna	0.71	0.039	0.71	0.042	0.71	0.044	0.71	0.046	0.71	0.048
4.	Parbhani	1.77	0.098	1.77	0.104	1.77	0.109	1.77	0.114	1.77	0.119
5.	Osmanabad	1.78	0.099	1.78	0.104	1.78	0.109	1.78	0.115	1.78	0.120
6.	Latur	1.46	0.081	1.46	0.085	1.46	0.090	1.46	0.094	1.46	0.099

Contd.

Contd :

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Buldhana	2.28	0.127	2.28	0.133	2.28	0.140	2.28	0.147	2.28	0.154	
8. Amraoti	1.89	0.105	1.89	0.111	1.89	0.116	1.89	0.121	1.89	0.126	
9. Akola	2.76	0.153	2.76	0.161	2.76	0.170	2.76	0.178	2.76	0.185	
10. Jalgaon	2.22	0.123	2.22	0.130	2.22	0.137	2.22	0.143	2.22	0.150	
11. Indore	0.45	0.025	0.45	0.026	0.45	0.028	0.45	0.029	0.45	0.030	
12. Khargaon	1.66	0.092	1.66	0.097	1.66	0.102	1.66	0.107	1.66	0.112	
13. Manasaor	1.29	0.071	1.29	0.075	1.29	0.079	1.29	0.083	1.29	0.087	
14. Ratlaum	0.54	0.029	0.54	0.026	0.54	0.033	0.54	0.035	0.54	0.036	
15. Dhar	0.68	0.038	0.68	0.039	0.68	0.042	0.68	0.048	0.68	0.046	
16. Devas	1.06	0.059	1.06	0.062	1.06	0.065	1.06	0.068	1.06	0.072	
17. Shajapur	1.46	0.081	1.46	0.085	1.46	0.090	1.46	0.094	1.46	0.099	
18. Rajgarh	1.25	0.069	1.25	0.073	1.25	0.077	1.25	0.081	1.25	0.084	
19. Khandwa	1.16	0.064	1.16	0.068	1.16	0.071	1.16	0.075	1.16	0.078	
20. Ujjain	1.58	0.087	1.58	0.092	1.58	0.097	1.58	0.101	1.58	0.106	
21. Jhalwar	1.10	0.061	1.10	0.064	1.10	0.067	1.10	0.070	1.10	0.074	
Total :	28.86	1.601	28.86	1.688	28.86	1.775	28.86	1.861	28.86	1.948	
IV. Plateau sub-zone with medium to deep black soils :											
1. Nanded	2.51	0.139	2.51	0.146	2.51	0.154	2.51	0.161	2.51	0.169	
2. Yeotmal	2.43	0.136	2.43	0.142	2.43	0.149	2.43	0.156	2.43	0.164	
3. Wardha	1.23	0.068	1.23	0.071	1.23	0.075	1.23	0.079	1.23	0.083	
4. Nagpur	1.43	0.079	1.43	0.084	1.43	0.087	1.43	0.092	1.43	0.097	
Total :	7.60	0.422	7.60	0.446	7.60	0.467	7.60	0.490	7.60	0.513	
Grand Total:	41.02	2.277	41.02	2.400	41.02	2.523	41.02	2.646	41.02	2.769	
M.S.	28.46	1.580	28.46	1.665	28.46	1.750	28.46	1.836	28.46	1.921	

Table :13: Targets of certified seed requirement of Rabi Jowar for VIII FYP for Western Plateau and Hills region Zone 9.

		Area in lakh ha. Seed requirement in lakh quintals.									
		1990-91		1991-92		1992-93		1993-94		1994-95	
1.	2. District	3. Area	4. Seed re-quire.	5. Area	6. Seed re-quire.	7. Area	8. Seed re-quire.	9. Area	10. Seed re-quire.	11. Area	12. Seed re-quire.
<b>I. Hills sub-zone :</b>											
1.	Nasik	0.634	0.047	0.603	0.047	0.570	0.048	0.536	0.046	0.503	0.045
2.	Kolhapur	0.060	0.004	0.060	0.005	0.060	0.005	0.06	0.005	0.06	0.005
3.	Satara	1.501	0.111	1.422	0.111	1.343	0.110	1.264	0.108	1.185	0.107
4.	Pune	4.617	0.342	4.374	0.341	4.131	0.339	3.88	0.334	3.645	0.328
5.	Jhabua	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total :	6.812	0.504	6.459	0.504	6.104	0.501	5.748	0.491	5.393	0.485
<b>II. Scarcity sub-zone :</b>											
1.	Sangli	1.026	0.076	0.972	0.076	0.918	0.075	0.864	0.074	0.810	0.073
2.	Solapur	7.401	0.548	7.011	0.567	6.622	0.543	6.232	0.536	5.843	0.526
3.	Ahmadnagar	5.491	0.406	5.202	0.406	4.913	0.403	4.624	0.398	4.335	0.390
4.	Dhule	0.808	0.060	0.765	0.060	0.723	0.059	0.680	0.058	0.638	0.057
	Total :	14.726	1.090	13.950	1.088	13.176	1.080	12.400	1.066	11.626	1.046
<b>III. Plateau sub-zone with relatively medium black soils.</b>											
1.	Aurangabad	2.690	0.199	2.690	0.210	2.690	0.221	2.690	0.231	2.690	0.242
2.	Beed	2.750	0.204	2.750	0.215	2.750	0.226	2.750	0.237	2.750	0.248
3.	Jalna	1.490	0.110	1.490	0.116	1.490	0.122	1.490	0.128	1.490	0.134
4.	Parbhani	1.770	0.131	1.770	0.138	1.770	0.145	1.770	0.152	1.770	0.159
5.	Osmanabad	1.770	0.131	1.770	0.138	1.770	0.145	1.770	0.152	1.770	0.159
6.	Latur	0.460	0.034	0.460	0.036	0.460	0.037	0.460	0.040	0.460	0.041

Contd.

Contd.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Buldhana	0.010	0.001	0.010	0.001	0.010	0.001	0.010	0.001	0.010	0.001	0.001
8. Amraoti	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9. Avola	0.002	0.0001	0.002	0.0002	0.002	0.0002	0.002	0.0002	0.002	0.0002	0.0002
10. Jalgaon	0.420	0.031	0.420	0.033	0.422	0.035	0.422	0.363	0.422	0.038	
11. Indore	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12. Khargaoon	0.08	0.006	0.08	0.006	0.08	0.007	0.08	0.007	0.08	0.007	0.007
13. Mandsoar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14. Ratlaum	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15. Dhar	0.02	0.001	0.02	0.002	0.02	0.002	0.02	0.002	0.02	0.002	0.002
16. Devas	0.007	0.001	0.007	0.001	0.007	0.001	0.007	0.001	0.007	0.001	0.001
17. Shajapur	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18. Rajgarh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19. Khandwa	0.01	0.001	0.01	0.001	0.01	0.001	0.01	0.001	0.01	0.001	0.001
20. Ujjain	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21. Jhalwar	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total :	11.479	0.849	11.479	0.895	11.481	0.941	11.481	0.988	11.481	1.033	
<u>IV. Plateau sub-zone with medium to deep black soils :</u>											
1. Nanded	0.40	0.030	0.40	0.031	0.40	0.033	0.40	0.034	0.40	0.036	
2. Yeotmal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3. Wardha	0.01	0.001	0.01	0.001	0.01	0.001	0.01	0.001	0.01	0.001	0.001
4. Nagpur	0.58	0.043	0.58	0.045	0.58	0.048	0.58	0.050	0.58	0.052	
Total :	0.99	0.073	0.99	0.077	0.99	0.081	0.99	0.085	0.99	0.089	
Grand Total:	34.007	2.517	32.878	2.564	31.751	2.604	30.619	2.633	29.490	2.654	
M.S.	33.89	2.508	32.761	2.555	31.634	2.594	30.502	2.624	29.373	2.644	

Table :14: Targets of certified seed requirement of Rice for VIII FYP for Western Plateau and Hills region of Zone-9.

Sr. No.	District	Area in lakh ha. Seed requirement in lakh quintals.									
		1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
<b>I. Hills region :</b>											
1.	Nasik	0.40	0.148	0.40	0.156	0.40	0.164	0.40	0.172	0.40	0.180
2.	Kolhapur	1.00	0.37	1.00	0.39	1.00	0.41	1.00	0.43	1.00	0.45
3.	Satara	0.37	0.138	0.37	0.144	0.37	0.152	0.37	0.159	0.37	0.167
4.	Pune	0.54	0.200	0.54	0.211	0.54	0.221	0.54	0.232	0.54	0.243
5.	Jhabua	0.29	0.107	0.29	0.113	0.29	0.118	0.29	0.125	0.29	0.131
	Total :	2.60	0.962	2.60	1.014	2.60	1.066	2.60	1.118	2.60	1.170
<b>II. Scarcity sub-zone :</b>											
1.	Sangli	0.17	0.063	0.17	0.066	0.17	0.070	0.17	0.073	0.17	0.077
2.	Solapur	0.04	0.015	0.04	0.016	0.04	0.016	0.04	0.017	0.04	0.018
3.	Ahmednagar	0.07	0.026	0.07	0.027	0.07	0.029	0.07	0.030	0.07	0.032
4.	Phule	0.25	0.093	0.25	0.097	0.25	0.103	0.25	0.108	0.25	0.113
	Total :	0.53	0.196	0.53	0.207	0.53	0.217	0.53	0.228	0.53	0.239
<b>III. Plateau sub-zone with relatively medium black soils :</b>											
1.	Aurangabad	0.05	0.019	0.05	0.020	0.05	0.021	0.05	0.022	0.05	0.023
2.	Beed	0.07	0.026	0.07	0.027	0.07	0.029	0.07	0.030	0.07	0.032
3.	Jalna	0.04	0.015	0.04	0.016	0.04	0.016	0.04	0.017	0.04	0.018
4.	Parbhani	0.23	0.085	0.23	0.090	0.23	0.094	0.23	0.099	0.23	0.104
5.	Osmanabad	0.23	0.085	0.23	0.090	0.23	0.094	0.23	0.099	0.23	0.104
6.	Latur	0.17	0.063	0.17	0.066	0.17	0.070	0.17	0.073	0.17	0.077

Contd.



Contd.

1.	2.	3.	4.	5.	6.	8.	8.	9.	10.	11.	12.
7. Buldhana	0.03	0.011	0.03	0.012	0.03	0.012	0.03	0.013	0.03	0.014	
8. Amraoti	0.13	0.042	0.13	0.051	0.13	0.053	0.13	0.056	0.13	0.059	
9. Akola	0.08	0.030	0.08	0.031	0.08	0.033	0.08	0.034	0.08	0.036	
10. Jalgaon	0.09	0.033	0.09	0.035	0.09	0.037	0.09	0.039	0.09	0.041	
11. Indore	0.003	0.001	0.003	0.001	0.003	0.001	0.003	0.001	0.003	0.001	
12. Khargaon	0.18	0.066	0.18	0.070	0.18	0.074	0.18	0.077	0.18	0.081	
13. Nandsaur	0.004	0.001	0.004	0.002	0.004	0.002	0.004	0.002	0.004	0.002	
14. Ratlam	0.05	0.019	0.05	0.020	0.05	0.021	0.05	0.022	0.05	0.023	
15. Bhar	0.11	0.041	0.11	0.043	0.11	0.045	0.11	0.047	0.11	0.050	
16. Devas	0.02	0.007	0.02	0.008	0.02	0.008	0.02	0.009	0.02	0.009	
17. Shajapur	0.04	0.015	0.04	0.016	0.04	0.016	0.04	0.017	0.04	0.018	
18. Rajgarh	0.07	0.026	0.07	0.027	0.07	0.029	0.07	0.030	0.07	0.032	
19. Khandwa	0.31	0.115	0.31	0.121	0.31	0.127	0.31	0.133	0.31	0.140	
20. Ujjain	0.002	0.001	0.002	0.001	0.002	0.001	0.002	0.001	0.002	0.001	
21. Jhalwar	0.009	0.003	0.009	0.004	0.009	0.004	0.009	0.004	0.009	0.004	
Total :	1.918	0.710	1.918	0.748	1.918	0.786	1.918	0.825	1.918	0.863	
IV. <u>Plateau sub-zone with medium to deep black soils :</u>											
1. Nanded	0.38	0.141	0.38	0.148	0.38	0.156	0.38	0.163	0.38	0.171	
2. Yeotmal	0.11	0.041	0.11	0.043	0.11	0.045	0.11	0.047	0.11	0.050	
3. Wardha	0.09	0.033	0.09	0.035	0.09	0.037	0.09	0.039	0.09	0.041	
4. Nagpur	0.38	0.141	0.38	0.148	0.38	0.156	0.38	0.163	0.38	0.171	
Total :	0.960	0.355	0.960	0.374	0.960	0.394	0.960	0.413	0.960	0.432	
Grand Total:	6.008	2.223	6.008	2.343	6.008	2.463	6.008	2.583	6.008	2.704	
M.S.	4.92	1.820	4.92	1.919	4.92	2.017	4.92	2.116	4.92	2.214	

Table:15: Targets of certified seed requirement of wheat for VIII FYP for Western Plateau and Hills region of zone 9.

		Area in lakh ha. Seed requirement in lakh quintals.									
Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
<b>I. Hills region :</b>											
1.	Nasik	0.93	0.688	0.93	0.725	0.93	0.763	0.93	0.800	0.93	0.837
2.	Kolhapur	0.19	0.141	0.19	0.148	0.19	0.156	0.19	0.163	0.19	0.171
3.	Satara	0.27	0.200	0.27	0.211	0.27	0.221	0.27	0.232	0.27	0.243
4.	Pune	0.47	0.348	0.47	0.367	0.47	0.385	0.47	0.404	0.47	0.423
5.	Jhabua	0.19	0.141	0.19	0.148	0.19	0.156	0.19	0.163	0.19	0.171
	Total :	2.05	1.517	2.05	1.599	2.05	1.681	2.05	1.763	2.05	1.845
<b>II. Scarcity sub-zone :</b>											
1.	Sangli	0.28	0.207	0.28	0.218	0.28	0.230	0.28	0.241	0.28	0.252
2.	Solapur	0.46	0.340	0.46	0.359	0.46	0.377	0.46	0.396	0.46	0.414
3.	Ahmadnagar	0.89	0.659	0.89	0.694	0.89	0.730	0.89	0.765	0.89	0.801
4.	Dhule	0.47	0.348	0.47	0.367	0.47	0.385	0.47	0.404	0.47	0.423
	Total :	2.10	1.554	2.10	1.638	2.10	1.722	2.10	1.806	2.10	1.890
<b>III. Plateau sub-zone with relatively medium black soils :</b>											
1.	Aurangabad	0.47	0.348	0.461	0.360	0.451	0.370	0.442	0.380	0.432	0.389
2.	Beed	0.47	0.348	0.461	0.360	0.451	0.370	0.442	0.380	0.432	0.389
3.	Jalna	0.461	0.341	0.451	0.352	0.442	0.362	0.432	0.372	0.423	0.381
4.	Parbhani	0.617	0.457	0.605	0.472	0.592	0.485	0.580	0.499	0.567	0.510
5.	Osmanabad.	0.392	0.290	0.384	0.300	0.376	0.308	0.368	0.318	0.360	0.324
6.	Latur	0.206	0.152	0.202	0.153	0.197	0.162	0.193	0.166	0.189	0.170

Contd.

Contd.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Buldhana	0.314	0.232	0.307	0.239	0.301	0.247	0.294	0.253	0.288	0.259		
8. Amraoti	0.480	0.355	0.470	0.367	0.461	0.378	0.451	0.388	0.441	0.397		
9. Akola	0.441	0.326	0.432	0.337	0.423	0.347	0.414	0.356	0.405	0.365		
10. Jalgaon	0.461	0.341	0.451	0.352	0.442	0.362	0.432	0.372	0.423	0.381		
11. Indore	0.755	0.559	0.739	0.576	0.724	0.594	0.708	0.609	0.693	0.624		
12. Khargaon	0.353	0.261	0.346	0.270	0.338	0.277	0.331	0.285	0.324	0.292		
13. Mandasauri	0.637	0.471	0.624	0.487	0.611	0.501	0.598	0.514	0.585	0.527		
14. Ratlaum	0.343	0.254	0.336	0.262	0.329	0.270	0.322	0.277	0.315	0.284		
15. Dhar	0.764	0.565	0.749	0.584	0.733	0.601	0.718	0.617	0.702	0.632		
16. Devas	0.549	0.406	0.538	0.420	0.526	0.431	0.515	0.443	0.504	0.454		
17. Shajapur	0.539	0.399	0.528	0.412	0.517	0.424	0.506	0.435	0.495	0.446		
18. Rajgarh	0.431	0.319	0.422	0.329	0.414	0.339	0.405	0.348	0.399	0.356		
19. Khandwa	0.255	0.189	0.250	0.195	0.244	0.201	0.239	0.206	0.234	0.211		
20. Ujjain	0.706	0.522	0.691	0.539	0.677	0.555	0.662	0.569	0.648	0.583		
21. Jhalwar	0.451	0.334	0.442	0.345	0.432	0.354	0.423	0.364	0.414	0.373		
Total :	10.095	7.470	9.889	7.714	9.681	7.938	9.475	8.149	9.027	8.343		
IV. <u>Plateau sub-zone with medium to black soils :</u>												
1. Nanded	0.42	0.311	0.42	0.328	0.42	0.344	0.42	0.361	0.42	0.378		
2. Yeotmal	0.20	0.148	0.20	0.156	0.20	0.164	0.20	0.172	0.20	0.180		
3. Wardha	0.35	0.259	0.35	0.273	0.35	0.287	0.35	0.301	0.35	0.315		
4. Nagpur	0.76	0.562	0.76	0.593	0.76	0.623	0.76	0.654	0.76	0.684		
Total :	1.73	1.280	1.73	1.349	1.73	1.419	1.73	1.488	1.73	1.557		
Grand Total :	15.975	11.822	15.769	12.300	15.561	12.760	15.355	13.205	15.150	13.635		
M.S.	10.002	7.401	9.914	7.733	9.826	8.057	9.738	8.375	9.650	8.685		

Table : 16: Targets of certified seed requirement of gram for VIII FYP for Western Plateau and Hills region Zone 2. 73

Sr. No.	District.	1990-91		1991-92		1992-93		1993-94		1994-95			
		Area in lakh ha.		Seed requirement in lakh quintals.		Area in lakh ha.		Seed requirement in lakh quintals.		Area in lakh ha.		Seed requirement in lakh quintals.	
		Area	Seed re	Area	Seed re	Area	Seed re	Area	Seed re	Area	Seed re	Area	Seed re
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.		
<b>I. Hills sub-zone :</b>													
1.	Nasik	0.284	0.105	0.284	0.111	0.284	0.116	0.284	0.122	0.284	0.128		
2.	Kolhapur	0.256	0.098	0.256	0.101	0.256	0.105	0.256	0.110	0.256	0.115		
3.	Satara	0.626	0.232	0.626	0.244	0.626	0.257	0.626	0.269	0.626	0.282		
4.	Pune	0.359	0.133	0.359	0.140	0.359	0.147	0.359	0.154	0.359	0.162		
5.	Jhabua	0.322	0.119	0.322	0.126	0.322	0.132	0.322	0.138	0.322	0.145		
	Total :	1.847	0.683	1.847	0.720	1.847	0.757	1.847	0.794	1.847	0.831		
<b>II. Scarcity sub-zone :</b>													
1.	Sangli	0.193	0.071	0.193	0.075	0.193	0.079	0.193	0.083	0.193	0.087		
2.	Solapur	0.323	0.120	0.323	0.126	0.323	0.132	0.323	0.139	0.323	0.145		
3.	Ahmadnagar	0.265	0.080	0.265	0.103	0.265	0.109	0.265	0.114	0.265	0.119		
4.	Dhule	0.121	0.045	0.121	0.047	0.121	0.050	0.121	0.052	0.121	0.054		
	Total :	0.902	0.334	0.902	0.352	0.902	0.370	0.902	0.388	0.902	0.406		
<b>III. Plateau sub-zone with relatively medium black soils :</b>													
1.	Aurangabad	0.274	0.101	0.274	0.107	0.274	0.112	0.274	0.118	0.274	0.123		
2.	Beed	0.296	0.120	0.296	0.115	0.296	0.121	0.296	0.127	0.296	0.133		
3.	Jalna	0.151	0.056	0.151	0.059	0.151	0.062	0.151	0.065	0.151	0.070		
4.	Parbhani	0.355	0.131	0.355	0.138	0.355	0.146	0.355	0.153	0.355	0.160		
5.	Osmanabad	0.396	0.147	0.396	0.154	0.396	0.162	0.396	0.170	0.396	0.178		
6.	Latur	0.264	0.098	0.264	0.103	0.264	0.108	0.264	0.114	0.264	0.119		

Contd.

Contd.

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Buldhana	0.099	0.034	0.099	0.034	0.099	0.034	0.099	0.041	0.099	0.043	0.099	0.045
8. Amravati	0.130	0.048	0.130	0.051	0.130	0.051	0.130	0.053	0.130	0.056	0.130	0.059
9. Akola	0.155	0.057	0.155	0.060	0.155	0.060	0.155	0.064	0.155	0.067	0.155	0.070
10. Jalgaon	0.116	0.043	0.116	0.045	0.116	0.045	0.116	0.048	0.116	0.050	0.116	0.052
11. Indore	0.541	0.200	0.541	0.211	0.541	0.211	0.541	0.222	0.541	0.233	0.541	0.243
12. Kharggaon	0.120	0.044	0.120	0.047	0.120	0.047	0.120	0.049	0.120	0.052	0.120	0.054
13. Mansaur	1.535	0.568	1.535	0.599	1.535	0.599	1.535	0.629	1.535	0.660	1.535	0.691
14. Ratlam	0.716	0.265	0.716	0.279	0.716	0.279	0.716	0.294	0.716	0.308	0.716	0.322
15. Dhar	0.651	0.241	0.651	0.254	0.651	0.254	0.651	0.267	0.651	0.280	0.651	0.293
16. Devas	0.430	0.159	0.430	0.168	0.430	0.168	0.430	0.176	0.430	0.185	0.430	0.194
17. Shajapur	0.749	0.277	0.749	0.292	0.749	0.292	0.749	0.307	0.749	0.322	0.749	0.337
18. Rajgarh	0.502	0.186	0.502	0.196	0.502	0.196	0.502	0.206	0.502	0.216	0.502	0.226
19. Khandwa	0.081	0.030	0.081	0.032	0.081	0.032	0.081	0.033	0.081	0.035	0.081	0.036
20. Ujjain	1.009	0.373	1.009	0.394	1.009	0.394	1.009	0.414	1.009	0.434	1.009	0.454
21. Jhalwar	0.554	0.205	0.554	0.216	0.554	0.216	0.554	0.227	0.554	0.238	0.554	0.249
Total :	9.124	3.376	9.124	3.558	9.124	3.558	9.124	3.740	9.124	3.923	9.124	4.106
IV. Plateau sub-zone with medium to deep black soils :												
1. Nanded	0.174	0.064	0.174	0.068	0.174	0.068	0.174	0.071	0.174	0.075	0.174	0.078
2. Yeotmal	0.057	0.021	0.057	0.022	0.057	0.022	0.057	0.023	0.057	0.025	0.057	0.026
3. Wardha	0.048	0.018	0.048	0.018	0.048	0.018	0.048	0.020	0.048	0.021	0.048	0.022
4. Nagpur	0.160	0.059	0.160	0.062	0.160	0.062	0.160	0.066	0.160	0.069	0.160	0.072
Total :	0.439	0.162	0.439	0.171	0.439	0.171	0.439	0.180	0.439	0.189	0.439	0.198
Grand Total :	12.312	4.555	12.312	4.801	12.312	4.801	12.312	5.048	12.312	5.294	12.312	5.540
M.S.	5.102	1.888	5.102	1.990	5.102	1.990	5.102	2.092	5.102	2.194	5.102	2.296

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Table :17: Targets of certified seed requirement of Arhar for VIII FYP for Western Plateau and hills region of zone 9.

Sr. No.	District.	Area in lakh ha. Seed requirement in lakh quintals.									
		1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
<b>I. Hills sub-zone :</b>											
1.	Nasik	0.054	0.005	0.054	0.006	0.054	0.007	0.054	0.007	0.054	0.007
2.	Kolhapur	0.060	0.007	0.060	0.007	0.060	0.007	0.060	0.008	0.060	0.008
3.	Satara	0.075	0.008	0.075	0.009	0.075	0.009	0.075	0.010	0.075	0.010
4.	Pune	0.061	0.007	0.061	0.007	0.061	0.008	0.061	0.008	0.061	0.008
5.	Jhabua	0.073	0.008	0.073	0.009	0.073	0.009	0.073	0.009	0.073	0.010
	Total :	0.323	0.036	0.323	0.038	0.323	0.040	0.323	0.042	0.323	0.044
<b>II. Scarcity Sub-zone :</b>											
1.	Sangli	0.103	0.011	0.103	0.012	0.103	0.013	0.103	0.013	0.103	0.014
2.	Salapur	0.338	0.038	0.338	0.040	0.338	0.042	0.338	0.044	0.338	0.046
3.	Ahmadnagar	0.112	0.012	0.112	0.013	0.112	0.014	0.112	0.014	0.112	0.015
4.	Dhule	0.110	0.012	0.110	0.013	0.110	0.014	0.110	0.014	0.110	0.015
	Total :	0.663	0.074	0.663	0.078	0.663	0.082	0.663	0.086	0.663	0.090
<b>III. Plateau sub-zone with relatively medium black soils :</b>											
1.	Aurangabad	0.260	0.029	0.260	0.030	0.260	0.032	0.260	0.034	0.260	0.035
2.	Beed	0.351	0.039	0.351	0.041	0.351	0.043	0.351	0.045	0.351	0.047
3.	Jalna	0.277	0.031	0.277	0.032	0.277	0.035	0.277	0.036	0.277	0.037
4.	Parbhani	0.509	0.056	0.509	0.060	0.509	0.063	0.509	0.066	0.509	0.069
5.	Osmanabad	0.693	0.077	0.693	0.081	0.693	0.085	0.693	0.089	0.693	0.094
6.	Latur	0.358	0.040	0.358	0.042	0.358	0.044	0.358	0.046	0.358	0.048

Contd.

Contd.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Guldhana	0.464	0.052	0.464	0.054	0.464	0.057	0.464	0.060	0.464	0.063	
8. Amraoti	0.576	0.064	0.576	0.067	0.576	0.071	0.576	0.074	0.576	0.078	
9. Akola	0.585	0.065	0.585	0.068	0.585	0.072	0.585	0.075	0.585	0.079	
10. Jalgaon	0.135	0.015	0.135	0.016	0.135	0.017	0.135	0.017	0.135	0.018	
11. Indore	0.110	0.012	0.110	0.013	0.110	0.014	0.110	0.014	0.110	0.015	
12. Khargaoon	0.220	0.024	0.220	0.026	0.220	0.027	0.220	0.028	0.220	0.030	
13. Mandsoaur	0.071	0.008	0.071	0.008	0.071	0.009	0.071	0.009	0.071	0.010	
14. Ratlaum	0.043	0.005	0.043	0.005	0.043	0.005	0.043	0.006	0.043	0.006	
15. Dhar	0.088	0.010	0.088	0.010	0.088	0.011	0.088	0.011	0.088	0.012	
16. Dewas	0.141	0.016	0.141	0.016	0.141	0.017	0.141	0.018	0.141	0.019	
17. Shajapur	0.126	0.014	0.126	0.015	0.126	0.015	0.126	0.016	0.126	0.017	
18. Rajgarh	0.277	0.031	0.277	0.032	0.277	0.034	0.277	0.036	0.277	0.037	
19. Khandwa	0.163	0.018	0.163	0.019	0.163	0.020	0.163	0.021	0.163	0.022	
20. Ujjain	0.114	0.013	0.114	0.013	0.114	0.014	0.114	0.015	0.114	0.015	
21. Jhalwar	0.041	0.005	0.041	0.005	0.041	0.005	0.041	0.005	0.041	0.006	
Total :	5.602	0.622	5.602	0.655	5.602	0.689	5.602	0.723	5.602	0.756	
IV. Plateau sub-zone with medium to deep black soils :											
1. Nanded	0.409	0.045	0.409	0.048	0.409	0.050	0.409	0.053	0.409	0.055	
2. Yeotmal	0.614	0.068	0.614	0.072	0.614	0.076	0.614	0.079	0.614	0.083	
3. Wardha	0.335	0.037	0.335	0.039	0.335	0.041	0.335	0.043	0.335	0.045	
4. Nagpur	0.459	0.050	0.459	0.054	0.459	0.056	0.459	0.059	0.459	0.062	
Total :	1.817	0.202	1.817	0.213	1.817	0.224	1.817	0.224	1.817	0.245	
Grand Total :	8.405	0.933	8.405	0.983	8.405	1.034	8.405	1.084	8.405	1.135	
M.S.	6.938	0.770	6.938	0.812	6.938	0.853	6.938	0.895	6.938	0.936	

Table:18:

Targets of certified seed requirement of groundnut for VIII FYP for Western Plateau and Hills region of zone-9.

Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Area in lakh ha. Seed requirement in lakh quintals.											
<b>I. Hills sub-zone :</b>											
1.	Nasik	0.503	0.372	0.503	0.392	0.503	0.412	0.503	0.433	0.503	0.452
2.	Kolhapur	0.556	0.411	0.556	0.434	0.556	0.456	0.556	0.478	0.556	0.500
3.	Satara	0.626	0.463	0.626	0.488	0.626	0.513	0.626	0.538	0.626	0.563
4.	Pune	0.360	0.266	0.360	0.281	0.360	0.295	0.360	0.310	0.360	0.324
5.	Jhabua	0.187	0.138	0.187	0.146	0.187	0.153	0.187	0.161	0.187	0.168
	<b>Total :</b>	<b>2.232</b>	<b>1.165</b>	<b>2.232</b>	<b>1.741</b>	<b>2.232</b>	<b>1.830</b>	<b>2.232</b>	<b>1.920</b>	<b>2.232</b>	<b>2.000</b>
<b>I. Scarcity sub-zone :</b>											
1.	Sangli	0.364	0.269	0.365	0.285	0.365	0.299	0.365	0.314	0.266	0.329
2.	Solapur	0.147	0.109	0.148	0.115	0.150	0.123	0.152	0.131	0.154	0.139
3.	Ahmadnagar	0.136	0.101	0.136	0.106	0.137	0.112	0.137	0.118	0.138	0.124
4.	Dhule	0.921	0.681	0.933	0.728	0.945	0.775	0.957	0.823	0.969	0.872
	<b>Total :</b>	<b>1.568</b>	<b>1.160</b>	<b>1.582</b>	<b>1.234</b>	<b>1.597</b>	<b>1.310</b>	<b>1.611</b>	<b>1.385</b>	<b>1.627</b>	<b>1.464</b>
<b>II. Plateau sub-zone with relatively medium black soils :</b>											
1.	Aurangabad	0.140	0.104	0.140	0.109	0.140	0.115	0.140	0.120	0.140	0.126
2.	Beed	0.106	0.078	0.106	0.083	0.106	0.087	0.106	0.091	0.106	0.095
3.	Jalna	0.089	0.066	0.089	0.069	0.089	0.073	0.089	0.077	0.089	0.080
4.	Parbhani	0.083	0.061	0.083	0.065	0.083	0.068	0.083	0.071	0.083	0.078
5.	Osmanabad	0.166	0.123	0.166	0.129	0.166	0.136	0.166	0.143	0.166	0.148
6.	Latur	0.322	0.238	0.322	0.251	0.322	0.264	0.322	0.277	0.322	0.290

Contd.



Contd. (Groundnut) Table: 18:

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Buldhana	0.084	0.062	0.084	0.066	0.084	0.069	0.084	0.072	0.084	0.076	
8. Amraoti	0.229	0.169	0.229	0.179	0.229	0.188	0.229	0.197	0.229	0.206	
9. Akola	0.124	0.092	0.124	0.097	0.124	0.101	0.124	0.106	0.124	0.112	
10. Jalgaon	0.650	0.481	0.650	0.507	0.650	0.533	0.650	0.559	0.650	0.585	
11. Indore	0.011	0.008	0.011	0.009	0.011	0.009	0.011	0.009	0.011	0.010	
12. Khargaan	0.489	0.362	0.489	0.381	0.489	0.401	0.489	0.421	0.489	0.440	
13. Mand'saur	0.414	0.306	0.414	0.323	0.414	0.339	0.414	0.356	0.414	0.373	
14. Ratlaum	0.052	0.038	0.052	0.041	0.052	0.043	0.052	0.045	0.052	0.047	
15. Lhar	0.292	0.216	0.292	0.228	0.292	0.239	0.292	0.251	0.292	0.263	
16. Devas	0.078	0.058	0.078	0.061	0.078	0.064	0.078	0.067	0.078	0.070	
17. Shajapur	0.227	0.168	0.227	0.177	0.227	0.186	0.227	0.195	0.227	0.204	
18. Rajgarh	0.204	0.151	0.204	0.159	0.204	0.167	0.204	0.175	0.204	0.184	
19. Khandwa	0.182	0.135	0.182	0.142	0.182	0.149	0.182	0.157	0.182	0.164	
20. Ujjain	0.090	0.067	0.090	0.070	0.090	0.074	0.090	0.077	0.090	0.081	
21. Jhalwar	0.083	0.061	0.083	0.065	0.083	0.068	0.083	0.071	0.083	0.075	
Total :	4.115	3.045	4.115	3.210	4.115	3.374	4.115	3.539	4.115	3.704	
IV. Plateau sub-zone with medium to deep black soils :											
1. Nanded	0.061	0.045	0.061	0.048	0.061	0.050	0.061	0.052	0.061	0.055	
2. Yeotmal	0.158	0.117	0.158	0.123	0.158	0.131	0.158	0.136	0.158	0.142	
3. Wardha	0.117	0.087	0.117	0.091	0.117	0.096	0.117	0.101	0.117	0.105	
4. Nagpur	0.150	0.111	0.150	0.117	0.150	0.123	0.150	0.129	0.150	0.135	
Total :	0.486	0.360	0.486	0.379	0.486	0.399	0.486	0.418	0.486	0.437	
Grand Total:	8.401	6.217	8.415	6.564	8.430	6.913	8.444	7.262	8.460	7.614	
M.S.:	6.092	4.508	6.106	4.463	6.121	5.019	6.135	5.276	6.151	5.536	

Table :19: Targets of certified seed requirement of cotton for VIII FYP for Western Plateau and hills region of zone 9.

Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
Area in lakh ha. Seed requirement in lakh quintals.											
<u>I. Hills sub-zone :</u>											
1.	Nasik	0.035	0.004	0.035	0.004	0.035	0.004	0.035	0.005	0.035	0.005
2.	Kolhapur	0.005	0.001	0.005	0.001	0.005	0.001	0.005	0.001	0.005	0.001
3.	Satara	0.048	0.005	0.048	0.006	0.048	0.006	0.048	0.006	0.048	0.006
4.	Pune	0.017	0.002	0.017	0.002	0.017	0.002	0.017	0.002	0.017	0.002
5.	Jhabua	0.302	0.034	0.302	0.035	0.302	0.037	0.302	0.039	0.302	0.041
	Total :	0.407	0.045	0.407	0.046	0.407	0.050	0.407	0.053	0.407	0.055
<u>II. Scarcity Sub-zone :</u>											
1.	Sangli	0.017	0.002	0.016	0.002	0.016	0.002	0.016	0.002	0.015	0.002
2.	Solapur	0.084	0.009	0.083	0.010	0.081	0.010	0.079	0.010	0.077	0.010
3.	Ahmadnagar	0.025	0.003	0.025	0.003	0.024	0.003	0.024	0.003	0.023	0.003
4.	Dhule	0.587	0.065	0.575	0.067	0.563	0.069	0.551	0.071	0.539	0.073
	Total :	0.713	0.079	0.699	0.082	0.684	0.084	0.670	0.086	0.654	0.088
<u>III. Plateau sub-zone with relatively medium black soils :</u>											
1.	Aurangabad	0.532	0.059	0.532	0.062	0.532	0.065	0.532	0.069	0.532	0.072
2.	Beed	0.293	0.033	0.293	0.034	0.293	0.036	0.293	0.038	0.293	0.040
3.	Jalna	1.186	0.123	1.186	0.139	1.186	0.146	1.186	0.153	1.186	0.160
4.	Parbhani	2.316	0.257	2.316	0.271	2.316	0.285	2.316	0.299	2.316	0.313
5.	Osmanabad	0.094	0.010	0.094	0.011	0.094	0.011	0.094	0.012	0.094	0.013
6.	Latur	0.170	0.019	0.170	0.020	0.170	0.021	0.170	0.022	0.170	0.023

Contd.

Contd. cotton

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Burhanpur	2.756	0.306	2.756	0.322	2.756	0.339	2.756	0.356	2.756	0.372	2.756	0.372
8. Amravati	3.674	0.488	3.674	0.430	3.674	0.452	3.674	0.474	3.674	0.496	3.674	0.496
9. Akola	3.566	0.396	3.566	0.417	3.566	0.439	3.566	0.460	3.566	0.481	3.566	0.481
10. Jalgaon	1.828	0.203	1.828	0.214	1.828	0.225	1.828	0.236	1.828	0.247	1.828	0.247
11. Indore	0.019	0.002	0.019	0.002	0.019	0.002	0.019	0.002	0.019	0.002	0.019	0.003
12. Khargaon	16.96	1.883	16.96	1.984	16.96	2.086	16.96	2.188	16.96	2.290	16.96	2.290
13. Mandasaur	0.30	0.033	0.30	0.035	0.30	0.037	0.30	0.039	0.30	0.041	0.30	0.041
14. Ratlam	2.468	0.275	2.468	0.289	2.468	0.304	2.468	0.318	2.468	0.333	2.468	0.333
15. Dhar	5.320	0.591	5.320	0.622	5.320	0.654	5.320	0.686	5.320	0.718	5.320	0.718
16. Devas	3.939	0.437	3.939	0.461	3.939	0.484	3.939	0.508	3.939	0.532	3.939	0.532
17. Shajapur	1.874	0.208	1.874	0.219	1.874	0.231	1.874	0.242	1.874	0.253	1.874	0.253
18. Rajgarh	1.911	0.212	1.911	0.224	1.911	0.235	1.911	0.247	1.911	0.258	1.911	0.258
19. Khandwa	13.88	1.541	13.88	1.624	13.88	1.707	13.88	1.791	13.88	1.874	13.88	1.874
20. Ujjain	1.128	0.125	1.128	0.132	1.128	0.139	1.128	0.146	1.128	0.152	1.128	0.152
21. Jhalwar	0.086	0.010	0.086	0.010	0.086	0.011	0.086	0.011	0.086	0.012	0.086	0.012
Total :	64.3	7.137	64.3	7.523	64.3	7.909	64.3	8.291	64.3	8.681	64.3	8.681
IV. Plateau sub-zone with medium to deep black soils :												
1. Nanded	2.133	0.237	2.133	0.250	2.133	0.262	2.133	0.275	2.133	0.288	2.133	0.288
2. Yeotmal	4.284	0.476	4.284	0.501	4.284	0.527	4.284	0.553	4.284	0.578	4.284	0.578
3. Wardha	1.744	0.194	1.744	0.204	1.744	0.215	1.744	0.225	1.744	0.235	1.744	0.235
4. Nagpur	0.822	0.091	0.822	0.096	0.822	0.101	0.822	0.106	0.822	0.111	0.822	0.111
Total :	8.983	0.997	8.983	1.052	8.983	1.105	8.983	1.159	8.983	1.213	8.983	1.213
Grand Total:	74.403	8.250	74.389	8.704	74.374	9.148	74.360	9.592	74.344	10.036	74.344	10.036
M.S.	26.216	2.910	26.202	3.066	26.187	3.221	26.173	3.376	26.157	3.531	26.157	3.531

Table :20: Targets of seed requirement (sets) of sugarcane for VIII FYP for Western Plateau and hills region of zone-9.

Sr. No.	District	Area in lakh ha. Seed require. in lakh quintals (Cane).									
		1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
<b>I. Hills sub-zone :</b>											
1.	Nasik	0.258	14.319	0.258	15.093	0.258	15.867	0.258	16.125	0.258	17.415
2.	Kolhapur	0.576	31.968	0.576	33.696	0.576	35.424	0.576	37.152	0.576	38.088
3.	Satara	0.264	14.652	0.264	15.444	0.264	16.236	0.264	17.028	0.264	17.082
4.	Pune	0.349	19.370	0.349	20.417	0.349	21.464	0.349	22.511	0.349	23.558
5.	Jhabua	0.001	0.056	0.001	0.059	0.001	0.062	0.001	0.065	0.001	0.068
	Total :	1.448	80.364	1.448	84.708	1.448	89.052	1.448	93.396	1.448	97.074
<b>II. Scarcity sub-zone :</b>											
1.	Sangli	0.297	16.484	0.297	17.375	0.297	18.266	0.297	19.157	0.297	20.048
2.	Solapur	0.288	15.984	0.288	16.848	0.288	17.712	0.288	18.576	0.288	19.044
3.	Ahmadnagar	0.740	41.070	0.740	43.290	0.740	45.510	0.740	47.730	0.740	49.950
4.	Dhule	0.117	6.494	0.117	6.844	0.117	7.196	0.117	7.547	0.117	7.898
	Total :	1.442	80.031	1.442	84.357	1.442	88.683	1.442	93.009	1.442	97.335
<b>III. Plateau sub-zone with relatively medium black soils :</b>											
1.	Aurangabad	0.160	8.880	0.160	9.359	0.160	9.840	0.160	10.320	0.160	10.800
2.	Beed	0.089	4.940	0.089	5.207	0.089	5.474	0.089	5.741	0.089	6.008
3.	Jalna	0.064	3.552	0.064	3.744	0.064	3.936	0.064	4.128	0.064	4.032
4.	Parbhani	0.057	3.164	0.057	3.335	0.057	3.506	0.057	3.677	0.057	3.848
5.	Osmanabad	0.129	7.160	0.120	7.547	0.129	7.934	0.129	8.321	0.129	8.708
6.	Latur	0.045	2.498	0.045	2.633	0.045	2.768	0.045	2.903	0.045	3.038

Contd.

Contd. (Cane).

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7.	Buldhana	0.014	0.777	0.014	0.819	0.014	0.861	0.014	0.903	0.014	1.148
8.	Amraoti	0.004	0.222	0.004	0.224	0.004	0.246	0.004	0.258	0.004	0.270
9.	Akola	0.004	0.222	0.004	0.234	0.004	0.246	0.004	0.258	0.004	0.270
10.	Jalgaon	0.107	5.939	0.107	6.259	0.107	6.581	0.107	6.902	0.107	7.223
11.	Indore	0.024	1.332	0.024	1.404	0.024	1.476	0.024	1.548	0.024	1.620
12.	Kharggaon	0.016	0.888	0.016	0.936	0.016	0.948	0.016	1.032	0.016	1.080
13.	Mandsaur	0.009	0.500	0.009	0.526	0.009	0.554	0.009	0.581	0.009	0.608
14.	Ratlaum	0.012	0.666	0.012	0.702	0.012	0.738	0.012	0.774	0.012	0.810
15.	Dhar	0.010	0.555	0.010	0.585	0.010	0.615	0.010	0.645	0.010	0.675
16.	Devas	0.040	2.220	0.040	2.340	0.040	2.460	0.040	2.580	0.040	2.700
17.	Shajapur	0.017	0.944	0.017	0.995	0.017	1.046	0.017	1.097	0.017	1.148
18.	Rajgarh	0.012	0.666	0.012	0.702	0.012	0.738	0.012	0.774	0.012	0.810
19.	Khandwa	0.008	0.444	0.008	0.468	0.008	0.492	0.008	0.516	0.008	0.540
20.	Ujjain	0.022	1.221	0.022	1.287	0.022	1.353	0.022	1.419	0.022	1.485
21.	Jhalwar	0.011	0.611	0.011	0.644	0.011	0.677	0.011	0.710	0.011	0.743
	Total :	0.854	47.397	0.854	49.959	0.854	52.521	0.853	55.083	0.854	57.645
IV. Plateau sub-zone with medium to deep black soils :											
1.	Nanded	0.085	4.718	0.085	4.973	0.085	5.228	0.085	5.483	0.085	5.738
2.	Yeotmal	0.017	0.930	0.017	0.995	0.017	1.046	0.017	1.097	0.017	1.148
3.	Wardha	0.002	0.111	0.002	0.117	0.002	0.123	0.002	0.129	0.002	0.135
4.	Nagpur	0.002	0.111	0.002	0.117	0.002	0.123	0.002	0.129	0.002	0.135
	Total :	0.106	5.883	0.106	6.201	0.106	6.519	0.106	6.837	0.106	7.155
	Grand Total:	3.85	213.675	3.85	225.225	3.85	237.328	3.85	248.325	3.85	259.875
	M.S.	3.668	203.574	3.668	214.578	3.668	225.582	3.668	236.586	3.668	247.590

Table:21: Targets of certified requirement of Bajra for VIII FYP Western Plateau and Hills region of zone 9.

Sr. No.	District	1990-91		1991-92		1992-93		1993-94		1994-95	
		Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.	Area	Seed re-quire.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
I. <u>Hills sub-zone :</u>											
1.	Nasik	3.411	0.076	3.411	0.080	3.411	0.084	3.411	0.088	3.411	0.092
2.	Kolhapur	0.014	0.0003	0.014	0.0003	0.014	0.0003	0.014	0.0003	0.014	0.0003
3.	Satara	1.054	0.023	1.054	0.024	1.054	0.025	1.054	0.027	1.054	0.028
4.	Pune	1.478	0.033	1.478	0.035	1.473	0.036	1.478	0.038	1.478	0.039
5.	Jhabua	0.103	0.002	0.103	0.002	0.103	0.002	0.103	0.002	0.103	0.002
	Total :	6.060	0.135	6.060	0.142	6.060	0.149	6.060	0.156	6.060	0.164
II. <u>Scarcity sub-zone :</u>											
1.	Sangli	0.896	0.020	0.896	0.021	0.896	0.022	0.896	0.023	0.896	0.024
2.	Solapur	0.362	0.008	0.362	0.008	0.362	0.008	0.362	0.009	0.362	0.010
3.	Ahmadnagar	2.843	0.063	2,843	0.067	2.843	0.070	2.843	0.073	2.843	0.077
4.	Dhule	1.357	0.030	1.357	0.032	1.357	0.033	1.357	0.035	1.357	0.037
	Total :	5.458	0.121	5.458	0.128	5.458	0.134	5.458	0.141	5.458	0.147
III. <u>Plateau sub-zone with relatively medium to black soils :</u>											
1.	Aurangabad	1.623	0.036	1.623	0.038	1.623	0.040	1.623	0.042	1.623	0.044
2.	Beed	1.280	0.028	1.280	0.030	1.280	0.031	1.280	0.033	1.280	0.035
3.	Jalna	0.455	0.010	0.455	0.011	0.455	0.011	0.455	0.012	0.455	0.012
4.	Parbhani	0.098	0.002	0.098	0.002	0.098	0.002	0.098	0.002	0.098	0.003
5.	Osmanabad	0.131	0.003	0.131	0.003	0.131	0.003	0.131	0.003	0.131	0.004
6.	Latur	0.105	0.002	0.105	0.002	0.105	0.003	0.105	0.003	0.105	0.003

Contd.

## Contd. Bajra.

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
7. Buldhana		0.087	0.002	0.087	0.002	0.087	0.002	0.087	0.002	0.087	0.002
8. Amraoti		0.053	0.001	0.053	0.001	0.053	0.001	0.053	0.001	0.053	0.002
9. Akola		0.047	0.001	0.047	0.001	0.047	0.001	0.047	0.001	0.047	0.001
10. Jalgaon		1.135	0.025	1.135	0.027	1.135	0.028	1.135	0.029	1.135	0.031
11. Indore		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12. Kargan		0.280	0.006	0.280	0.007	0.280	0.007	0.280	0.007	0.280	0.008
13. Mandsaur		0.025	0.001	0.025	0.001	0.025	0.001	0.025	0.001	0.025	0.001
14. Ratlam		0.052	0.001	0.052	0.001	0.052	0.001	0.052	0.001	0.052	0.001
15. Dhar		0.076	0.002	0.076	0.002	0.076	0.002	0.076	0.002	0.076	0.002
16. Devas		0.003	0.0001	0.003	0.0001	0.003	0.0001	0.003	0.0001	0.003	0.0001
17. Shajapur		0.011	0.0002	0.011	0.0003	0.011	0.0003	0.011	0.0003	0.011	0.0003
18. Rajgarh		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19. Khandwa		0.011	0.0002	0.011	0.0003	0.011	0.0003	0.011	0.0003	0.011	0.0003
20. Ujjain		0.019	0.0004	0.019	0.0004	0.019	0.0005	0.019	0.0005	0.019	0.0005
21. Jhalwar		0.034	0.008	0.034	0.008	0.034	0.008	0.034	0.009	0.034	0.009
Total :		5.525	0.123	5.525	0.129	5.525	0.136	5.525	0.143	5.525	0.149
IV. Plateau sub-zone with medium to deep black soils :											
1. Nanded		0.011	0.0002	0.011	0.0003	0.011	0.0003	0.011	0.0003	0.011	0.0003
2. Yeotmal		0.093	0.002	0.093	0.002	0.093	0.002	0.093	0.002	0.093	0.003
3. Wardha		0.006	0.0001	0.006	0.0001	0.006	0.0001	0.006	0.0002	0.006	0.0002
4. Nagpur		0.005	0.0001	0.005	0.0001	0.005	0.0001	0.005	0.0001	0.005	0.0001
Total :		0.115	0.003	0.115	0.003	0.115	0.003	0.115	0.003	0.115	0.003
Grand Total:		17.158	0.381	17.158	0.401	17.158	0.422	17.158	0.443	17.158	0.463
M.S.		16.544	0.367	16.544	0.387	16.544	0.407	16.544	0.427	16.544	0.447

5.

LIVESTOCK AND POULTRY DEVELOPMENT

The Western Plateau and Hills Zone had 12.2% cattle, 8.35% buffaloes, 6.23% sheep, 8.82% goats and 13.13% poultry of the total livestock population of India (1982 census). This, livestock sector contributes about 12.5% to the national income. This zone has great scope for livestock and poultry development which is vital for improving the economy and social status of the people of rural areas and for improving the employment generation.

5.1. Rationale :

The per capita milk consumption in the sub-zones, ranges between 81 to 139 ml. as against 145 ml for India and 250 ml as per national recommendation. Similarly, the availability of eggs in the zone is 21 eggs per capita as against 25 eggs of the country. It is necessary that gap between demand and supply of milk, eggs and drought power is eliminated.

Zone 9 is devoid of any seashore hence fish production can only be done through inland fisheries. The total fish production of this zone is about 18472 MT (1984-85) which is very low and comes to around 2% of the total fish catch of the country.

5.2

Approach :

The population of cattle, buffaloes and working animals increased by (+) 36.90, (+) 8.04, (+) 32.68% respectively at zonal level during the period from 1976 to 1982. There is hardly any scope for increasing agricultural production due to limited land but livestock production can be increased many folds if improved and superior breeds of cattle and buffaloes are properly maintained. Half of the breedable cows of indigenous milch breeds should be subjected to cross breeding with superior exotic



milch breeds and half of the population should be crossed with indigenous draft breeds so as to get milk as well as draft power. In addition, high intensity of selection and rigorous standard of culling should be fixed to optimise the cattle and buffalo population. Buffaloes should be maintained only for milk production.

It is aimed to increase the per capita availability of milk from 130 ml to 190 ml by the end of 1995 with annual growth rate of 4% in the population of breedable cows and buffaloes. It is, therefore, planned to increase average annual milk yield of indigenous cows to 400 litres, cross bred cows to 2000 litres and that of buffaloes to 1000 litres. It is, therefore, essential to give first priority to cattle and buffalo development in sub-zone I and III and second priority in sub-zone II and IV during VIII Plan.

It is envisaged to increase poultry production at 6% annual growth rate during VIII Plan so as to increase the per capita eggs consumption from 21 to 40. On an average Desi bird produces 125 eggs per annum whereas high yielding strain of poultry, like white Leghorn lays 260 eggs in a year. In order to achieve the above target, about 37 million birds including 9.25 million birds of high yielding strain will be required. Hence, poultry development receives first priority in sub-zone, I, II and III and second priority in sub-zone IV during VIII Plan.

The total income from the sheep and goat production in terms of mutton, wool, skins and goat's milk comes to around Rs. 236.1 millions. The economics of sheep and goat farming can be improved by improving genetic makeup of indigenous sheep and goats and reducing the losses by improving the animal health cover. It is envisaged to increase the sheep and goat production at the annual growth rate of 2.5% during the VIII Plan. It is, therefore, essential to give first priority to sheep and goat

development in sub-zone I, II and III and second priority in sub-zone IV.

The fish production increased substantially at (+) 26.5% in zone 9 during the period from 1976-77 to 1984-85. Fish is an important source of quality protein to the human diet. Fish production can be increased by developing aquaculture and fish culture with multiple species of grass carp.

### 5.3 Line of action :

Assuming 6%, 4%, 2.5% and 10% annual growth rate of poultry, cattle and buffaloes, sheep and goats and fisheries respectively the projected population at the end of VIII Plan i.e. 1995 is presented in Table 1. For achieving the projected levels of production, the following actions need to be initiated. The action to be initiated sub-zone wise are given in Table 2.

1. Improvement in the productivity of indigenous milch breeds of cattle by selective breeding and cross breeding with Jersey or Holstein Friesian limited to 50% exotic inheritance with interse mating be undertaken. Similarly, indigenous local breeds of buffaloes should be crossbred with Murrah and Jaffarabadi.
2. For effective implementation of cattle and buffalo development programme, it is essential to have peoples' participation, marketing facilities, man power development, transfer of technology, research and education.
3. For poultry development, the existing hatcheries and poultry breeding farms be strengthened and additional hatcheries, poultry Disease Investigation Laboratories and Poultry Breeding Farms be set up to have at least 2.5 lakh birds of high yielding strain of white leghorn in each district by the end of 1995,

Table 1: Target level for livestock, poultry and fishery production during 1990-95

Particulars	Sub-zone				Zone-9
	I	II	III	IV	
<b>1. * CATTLE AND BUFFALOES</b>					
i) Cattle population (in lakh)	9.0	5.5	40.6	12.7	67.8
ii) Buffalo population (in lakh)	6.9	3.7	17.1	02.4	9.81
iii) Cow milk(in lakh lit)	12.3	14.5	53.3	16.6	96.7
iv) Buffalo milk(in lakh lit.)	20.8	3.0	14.1	2.0	40.0
v) Milk consumption/capita (ml)	213	155	225	210	190
<b>2. * POULTRY</b>					
i) Population(in lakh)	118.0	77.3	140.0	35.0	370.30
ii) Egg production (in million)	1148.0	752	1393	353	3646
iii) Egg/capita/annum	74	66	44	40	44
3) Sheep population (in lakh)	14.18	13.16	10.12	1.22	38.70
4) Goat population (in lakh)	21.77	24.44	60.66	13.84	120.72
5) Fish production (in'000'MT)	6.315	6.536	22.505	12.553	47.911

\* Projections based on the data from Statistical Hand Book, 1986, Directorate of Animal Husbandry, M. S. Pune and M. P. Bhopal.

Table 2: Action to be initiated sub-zone-wise

Sr. NO.	Particulars	Breeds	Sub-zone		Strength	Estimate investment (Rs. lakh)
1	2	3	4		5	6
1.	Production of exotic bulls	1. Jersey	I	Bulls	5	230.0
				Cows	100	
		2. Holstein Freisian	II III	Bulls	5	230.0
				Cows	100	230.0
2.	Production of crossbred bulls and heifers	1. HF x Khillar	I	Bulls	10	200.0
				Cows	100	
		2. HF x Dangi		Bulls	10	200.0
				Cows	100	
		1. J/HFx Sahiwal	IV.	Bulls	10	200.0
				Cows	100	
		2. HFx Gavlae		Bulls	10	200.0
				Cows	100	
1. J/HFx and Malwi	Nimar III	Bulls	10	200.0		
		Cows	100			
3.	Production of bulls and heifers of indigenous breeds.	1. Khillar	I	Bulls	5	150.0
				Cows	100	
		2. Nimar and Malwi	III	Bulls	10	150.0
				Cows	100	
4.	Buffalo breed	1. Pandharpuri	II & III	Buff. Bulls	5	420.0
				She. Buff.	100	
		2. Surti	III	Buff. Bulls	5	210.0
				She. Buff.	100	
		3. Nagpuri & Murrah	IV	Buff. Bulls	5	210.0
				She. Buff.	100	
5.	Frozen semen lab.	1. Jersey & Murrah	I, II, III & IV.			840.0
6.	Feed Plant	8MT/day/shift.	I, II, III & IV	Cost of plants		140.0
7.	Vet. Res. Centre.	Cattle, Buffalo, Sheep, Goat	I, II, III and IV			1600.0

Contd...

Table 2:Contd..

1	2	3	4	5	6
8.	Modern slaughter house	Cattle, Buffalo, Sheep, Goat	I, II, III and IV.		170.0
9.	Biological products Lab.	-do-	-do-		50.0
10.	Broiler farms		I, II, III & IV	10 lakhs birds in each sub-zone.	1300.0
11.	Layer farms	WL	-do-	-do-	7420.0
12.	Central Hatchery (Broilers & Layers)		I, II, III	45 lakhs day old chickens	1890.0
13.	Poultry research and management institute.		I, II, III and IV.	40,000 birds	750.0
14.	Sheep farm	Local & improved	I, II, & III	10 lakhs	4000.0
15.	Goat farm	-do-	I, II, III and IV.	-do-	4000.0
16.	Fish farms		-do-	2.0 Million MT.	25.0

4. The poultry research-cum-management institute to produce improved birds and to impart training to the poultry farmers and rural youths be established. Poultry feed manufacturing units, marketing facilities including export and cold storage be provided for processed meat and eggs.

5. The local breeds of sheep and goats should be improved by cross breeding with superior and improved breeds for wool and mutton production and improved males should be distributed to the sheep and goat farming community. Adequate nutritious fodder by developing pastures, grazing land and efficient health cover be provided.

6. For development of inland fisheries, the available sources of fresh water i.e. river, lakes, reservoir and tank should be utilised to the maximum extent. The fish production centres, fish farms and nurseries should be developed. Fisheries research and training centres, cooperatives, marketing and preservation facilities should be provided.

#### 5.4 INSTITUTIONAL MECHANISM AND FUNDING :

1. The existing cattle and buffalo breeding farms be strengthened and additional farms should be established for producing pure exotic, cross bred and indigenous bulls, and cows of desired genetic potential preferably in the home tract of indigenous breed. Similarly, frozen semen laboratories, liquid nitrogen plants, A.I. centres and sub-centres and feed plants should be strengthened and the additional ones should be established under public sector/ State Agricultural Universities as detailed below. The activity should be funded by Central/ State/ NABARD/ World Bank and other Financial Institutions.

2. Co-operatives Dairy Farming should be encouraged around big cities by providing financial credit through Nationalised Banks, NABARD, Central/ State Government etc. Nutritious feeds and fodder should also be provided on subsidised rates (25%) to the cooperative dairies.

3. As per the recommendation of National Agricultural Commission, one Veterinary Graduate is required for 10,000 cattle units. Accordingly, the technical manpower requirement of this zone is around 7,000 whereas the present staff position are around 3,000. Hence, there is an urgent need to create about 4,000 positions for technical Veterinary Graduates so as to man the various livestock and poultry development scheme in this zone.

4. Veterinary Research Centres and Veterinary Biological products Laboratories should be established under public/ State Agricultural University/ ICAR (under AICRP) in each sub-zone to undertake research on new emerging animal diseases and to provide protective health cover.

5. Dairy plants with chilling facilities be established in milkshed areas in each district under public sector. Public distribution system should be adopted in each city with 2-3 lakhs population.

6. Poultry development programme should be encouraged through cooperative/private sector around big cities of this zone. The financial credits be provided by Nationalised Bank / NABARD/ State/ Central Government etc.

7. Sheep and goats breeding farms for wool, meat, milk hair and skin production be established under Co-operatives/ Private/ Public Sector, SAU. The financial support be advanced by Nationalised Banks/ NABARD/ Central/ State Governments as 25-30% subsidies/ loans for the sheep and goat farming.

8. The fish seeds be procured from West Bengal and fish farms, nurseries be developed in the watershed areas of each sub-zone. The financial credit as subsidies (25-30%) or loan be provided to the cooperatives.

5.5 Districtwise projected physical targets and financial investments :

The districtwise population and the estimated investment to be incurred during VIII Plan are presented in Table 3, 4 and 5.

Table 3: Districtwise projected target and financial investment for poultry development during VIII Five Year Plan

Sl. NO.	District	Poultry population (in lakhs)		Broiler farms (in lakhs)		Layer farms (WL (in lakhs))		Central Hatchery (for broiler and layers) in lakhs	Poultry Research & Management Rs. in lakhs		
		1982	1995	Birds	Rs.	Birds	Rs.				
									Day old female chick	Rs.	Rs.
1	2	3	4	5	6	7	8	9	10	11	
1.	Nasik	7.05	14.05	2.5	45.0	1.0	127.85	45.0	670.0	--	
2.	Pune	28.74	61.21	2.5	45.0	1.0	127.85	--	--	--	
3.	Satara	11.64	24.75	2.5	45.0	1.0	127.85	--	--	--	
4.	Kolhapur	7.66	16.21	2.5	45.0	1.0	127.85	--	--	150.0	
5.	Ahmednagar	11.88	24.80	2.5	45.0	1.0	127.85	--	--	--	
6.	Sangli	15.70	23.34	2.5	45.0	1.0	127.85	--	--	150.0	
7.	Solapur	10.24	21.78	2.5	45.0	1.0	127.85	45.0	670.0	--	
8.	Dhule	5.47	11.56	2.5	45.0	1.0	127.85	--	--	--	
9.	Aurangabad	2.00	4.66	1.0	18.0	1.0	127.85	--	--	150.0	
10.	Jalna	1.35	02.81	1.0	18.0	1.0	127.85	--	--	--	
11.	Beed	3.97	08.36	1.0	18.0	1.0	127.85	--	--	--	
12.	Parbhani	2.13	04.46	1.0	18.0	1.0	127.85	45.0	670.0	--	
13.	Osmanabad	1.33	03.67	1.0	18.0	1.0	127.85	--	--	--	
14.	Latur	1.49	3.07	1.0	18.0	1.0	127.85	--	--	--	
15.	Amravati	2.68	5.67	1.0	18.0	1.0	127.85	45.0	670.0	--	
16.	Akola	2.55	5.37	1.0	18.0	1.0	127.85	--	--	--	
17.	Buldhana	2.38	5.04	1.0	18.0	1.0	127.85	--	--	--	
18.	Jalgaon	3.41	7.18	1.0	18.0	1.0	127.85	--	--	--	
19.	Nanded	2.83	5.94	1.0	18.0	1.0	127.85	--	--	--	

Contd....



Table 3 Contd...

1	2	3	4	5	6	7	8	9	10	11
20. Yeotmal		05.67	12.04	1.0	18.0	1.0	127.85	-	-	-
21. Nagpur		3.77	7.93	1.0	18.0	1.0	127.85	-	-	150.0
22. Wardha		1.65	3.43	1.0	18.0	1.0	127.85	-	-	-
23. Khandwa		0.68	1.36	1.0	18.0	1.0	127.85	-	-	-
24. Khargone		3.48	7.34	1.0	18.0	1.0	127.85	45.0	670.0	150.0
25. Indore		1.30	2.68	1.0	18.0	1.0	127.85	-	-	-
26. Dhar		2.03	4.26	1.0	18.0	1.0	127.85	-	-	-
27. Ujjain		0.64	1.28	1.0	18.0	1.0	127.85	45.0	670.0	-
28. Ratlam		0.67	1.35	1.0	18.0	1.0	127.85	-	-	-
29. Shahajapur		0.61	1.21	1.0	18.0	1.0	127.85	-	-	-
30. Mandisor		0.73	1.47	1.0	18.0	1.0	127.85	-	-	-
31. Dewas		0.79	3.75	1.0	18.0	1.0	127.85	-	-	-
32. Rajgarh		2.27	0.47	1.0	18.0	1.0	127.85	-	-	-
33. Jhabua		3.72	7.86	1.0	18.0	1.0	127.85	-	-	-
34. Jhalwar		0.80	1.61	1.0	18.0	1.0	127.85	-	-	-
Grand Total		151.98	312.85	46.0	852.0	34.0	4220.70	270.0	4020.0	750.0
Total of 22 Districts of Maharashtra State		136.26	278.21	34.00	636.0	22.0	2813.80	180.0	268.0	600.0

Table 4: Districtwise projected targets and financial investments for cattle and Buffalo Development during VIII Five Year Plan

CR

Sr. NO.	District	Cattle population (in lakhs)		Buffalo popu. (in lakhs)		Production of Exotic bulls (Rs.in lakhs)	Production of crossbreed bulls & Heifers (Rs.in lakhs)	Prodn.of bulls and Heifers indigenous (Rs. in lakhs)
		1982	1995	1982	1995			
1	2	3	4	5	6	7	8	9
1.	Nasik	10.99	18.21	1.36	2.19	Jersey (Rs.270.0)	-	-
2.	Pune	10.72	17.78	1.80	2.93	-	-	-
3.	Satara	07.37	11.72	2.57	4.19	-	-	Khillar (Rs.180.0)
4.	Kolhapur	7.15	11.37	4.99	8.78	-	HF x Khillar HF x Dargi. (Rs.400.0)	-
5.	Ahmednagar	11.69	19.37	1.16	1.93	-	-	-
6.	Sangli	6.68	11.08	2.88	4.77	-	-	-
7.	Solapur	8.07	13.43	1.83	3.05	HF (230.0)	-	-
8.	Dhule	8.65	14.36	1.35	2.24	-	-	-
9.	Aurangabad	6.13	10.12	0.56	0.85	-	-	-
10.	Jalna	4.82	7.95	0.49	0.74	-	-	-
11.	Beed	7.79	12.89	1.10	1.75	-	-	-
12.	Parbhani	8.29	13.72	1.19	1.90	-	-	-
13.	Osmanabad	4.95	8.16	1.10	1.75	-	-	-
14.	Latur	5.16	8.54	1.17	1.87	-	-	-
15.	Amravati	6.80	1.26	0.92	1.45	HF (230.0)	-	-
16.	Akola	9.07	15.02	1.09	1.74	-	-	-
17.	Buldhana	7.45	12.32	1.04	1.65	-	-	-
18.	Jalgaon	9.24	5.29	2.55	4.17	-	-	-
19.	Nanded	6.86	14.68	1.69	2.74	-	JxK (Rs.200.0)	-
20.	Yeotmal	9.07	15.02	1.03	1.64	-	-	-
21.	Nagpur	7.53	12.48	0.61	1.02	-	JHF x Sahiwal (Rs.200.)	-
22.	Wardha	4.34	7.15	0.41	0.58	-	HF/JxGavallo (Rs.200.0)	-
Total						340.0	1000.0	180.0

Table 4 Contd.

1.	2.	3	4	5	6	7	8	9
23. Shahajapur		4.76	7.85	1.74	2.82	-	-	Malvi (Rs.50.0)
24. Mandsour		6.17	0.19	1.94	3.16	-	J/HFxNimar	-
25. Diwas		3.89	6.39	1.25	2.07	Jersey (Rs.230)	Malvi (Rs.50.0)	Nemar (Rs.50.0)
26. Rajgarh		4.02	6.62	1.97	3.20	-	-	-
27. Jhabua		5.30	8.40	9.10	15.05	-	JxDangi (Rs.50)	-
28. Jhalwar		5.09	8.39	1.66	2.67	-	J/HFxMalwi (Rs.50.0)	-
29. Khandwa		4.29	7.08	1.11	1.76	-	JxNemar (Rs.50.0)	-
30. Kharagaone		6.90	11.40	1.86	3.02	-	-	-
31. Indore		1.89	3.06	1.08	1.71	HF (Rs.230.0)	-	-
32. Dhar		5.27	8.65	1.39	2.22	-	-	-
33. Ujjain		3.66	6.02	1.87	3.04	-	-	-
34. Ratlam		3.53	5.80	1.47	2.57	-	-	-
Grand Total						1190.0	1200.0	280.0

Table 4 Contd...

Sr. NO.	District	Buffalo breeding farms (Rs.in lakhs)	Foreign semen lab. (Rs.in lakhs)	Feed plant (Rs.in lakh)	Veterinary Res. Centre (Cattle, buffalo, sheep & Goat) (Rs.in lakh)	Biological products Lab. (Rs.in lakhs)
1	2	10	11	12	13	14
1.	Nasik	-	Jersey (Rs.210)	35.0	-	-
2.	Pune	-	-	-	320.0	-
3.	Satara	-	-	-	-	-
4.	Kolhapur	-	-	-	-	-
5.	Ahmednagar	-	HF-210.0	-	-	-
6.	Sangli	-	-	35.0	-	-
7.	Solapur	Pandharpuri (Rs. 210.0)	-	-	-	-
8.	Dhule	-	-	-	-	-
9.	Aurangabad	-	-	-	-	-
10.	Jalna	-	-	-	320.0	50.0
11.	Beed	-	-	-	-	-
12.	Parbhani	Surti (Rs.210.0)	-	-	-	-
13.	Osmanabad	Pandharpuri (210.0)	-	-	-	-
14.	Latur	-	-	-	-	-
15.	Amravati	-	HF/J (Rs.210.0)	-	-	-
16.	Akola	-	-	-	-	-
17.	Buldhena	-	-	-	320.0	-
18.	Jalgaon	Surti (Murrah) Jaffarabadi (Rs.70.0)	-	-	-	-
19.	Nanded	-	-	-	-	-
20.	Yeotmal	-	-	-	-	50.0
21.	Nagpur	Nagpur/Murrah (Rs.210.0)	Murrah/Jaffarabi Nagpuri (Rs.210.0)	-	-	-
22.	Wardha	-	-	-	-	-
Total		630.0	840.0	70.0	960.0	100.0

Table 4 Contd..

	2	10	11	12	13	14
23. Shahajapur	-	-	-	15.0	-	-
24. Mandsour	-	-	-	-	-	-
25. Diwas	-	-	-	-	-	-
26. Rajgarh	-	-	-	-	-	-
27. Jhabua	-	-	-	-	-	50.0
28. Jhalwar	-	-	Jaffrabadi (Rs. 270.0)	-	-	-
29. Khandwa	-	-	-	-	-	-
30. Khargaone	-	-	-	-	-	-
31. Indore	-	Murrah (Rs. 270.0)	-	35.0	-	-
32. Dher	-	-	-	-	-	-
33. Ujjain	-	-	-	-	-	-
34. Ratlam	-	-	-	-	32.0	-
Grand Total	700.0		910.0	120.0	1280.0	150.0

Table 5: Districtwise projected target and financial investment for sheep, goat and fisheries development during VIII Five Year Plan

Sr. No.	District	Sheep population(in lakh)		Goat population(in lakh)		Fish prodn. (MT)		Sheep farm (in lakh)		Goat farm in lakh		Fish farm	
		1982	1995	1982	1995	1982-	1995	Ani.	Rs.	Ani.	Rs.	'000' MT	Rs. Lakh
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.	Nasik	2.11	2.83	4.12	5.36	580	2000	1.0	400	0.5	200	2.0	0.5
2.	Pune	3.94	5.38	4.66	6.38	880	3029	1.0	400	0.5	200	2.0	0.75
3.	Satara	2.96	4.00	2.85	3.90	460	1581	1.0	400	0.5	200	1.5	0.375
4.	Kolhapur	1.22	1.61	1.58	2.11	320	1096	1.0	400	0.5	200	1.0	0.25
5.	Ahmednagar	3.41	4.77	6.40	8.75	820	2830	1.0	400	0.5	200	3.0	0.75
6.	Sangli	2.37	3.20	2.58	3.48	160	552	1.0	400	0.5	200	0.5	0.125
7.	Solapur	2.68	3.62	5.64	4.70	480	1657	1.0	400	0.5	200	1.5	0.375
8.	Dhule	1.09	1.02	3.11	4.20	1860	6021	1.0	400	0.5	200	6.0	1.5
9.	Aurangabad	0.67	0.80	0.94	3.98	1820	6283	-	-	0.5	200	6.0	1.5
10.	Jalna	0.42	0.55	2.03	2.73	800	2761	-	-	-	-	3.0	0.75
11.	Beed	1.68	2.25	3.32	4.51	340	1173	1.0	400	0.5	200	1.0	0.25
12.	Parbhani	0.41	0.53	2.58	3.48	1340	4626	-	-	0.5	200	5.0	1.25
13.	Osmanabad	0.42	0.55	1.80	2.40	290	1001	-	-	-	-	1.0	0.25
14.	Latur	0.39	0.51	1.42	1.88	250	632	-	-	-	-	0.5	0.125
15.	Amravati	0.21	0.28	0.65	3.57	720	2485	-	-	0.5	200	2.5	0.625
16.	Akola	0.16	0.21	2.73	3.69	840	2900	-	-	0.5	200	3.0	0.75
17.	Buldhana	0.57	0.70	2.92	3.96	480	1681	1.0	400	0.5	200	1.5	0.375
18.	Jalgaon	0.36	0.48	3.28	4.45	1240	4280	-	-	0.5	200	4.5	1.125
19.	Nanded	0.50	0.63	2.39	3.22	1280	4418	-	-	0.5	200	4.5	1.125
20.	Yeotmal	0.09	0.26	3.40	4.62	1200	4112	-	-	0.5	200	4.0	1.00
21.	Nagpur	0.02	0.03	2.79	3.78	320	1104	-	-	0.5	200	0.1	0.25
22.	Wardha	0.08	0.16	1.46	1.93	2120	7318	-	-	-	-	7.5	1.875
23.	Total	25.86	34.37	66.66	85.08	18600	64040	10.0	4000	9.5	3600	62.5	151875

Contd...

Table 5 Contd...

1	2	3	4	5	6	7	8	9	10	11	12	13	14
23.	Khandwa	0.09	0.14	1.25	1.65	72	248	-	-	-	-	0.25	0.625
24.	Khargone	0.13	0.17	2.67	3.60	123	426	-	-	0.5	200	0.50	0.125
25.	Indore	0.04	0.05	0.62	0.75	41	141	-	-	-	-	0.25	0.0625
26.	Dhar	0.14	0.18	2.23	2.99	15	50	-	-	0.5	200	0.10	0.025
27.	Ujjain	0.17	7.22	1.33	1.75	196	678	-	-	-	-	0.75	0.1875
28.	Ratlam	0.31	0.42	0.19	1.52	6	20	-	-	-	-	0.25	0.0625
29.	Shahajapur	0.07	0.08	1.39	1.84	6	20	-	-	-	-	0.25	0.0625
30.	Mandsour	0.88	1.14	2.64	3.56	351	1211	0.5	200	0.5	200	1.50	0.375
31.	Diwas	0.02	0.03	1.12	1.47	5	17	-	-	-	-	0.25	0.0625
32.	Kajgarh	0.13	0.17	0.05	1.36	19	62	-	-	-	-	0.50	0.125
33.	Jhabua	0.06	0.08	2.15	2.89	195	662	0.5	200	-	-	1.00	0.25
34.	Jhalwar	0.02	0.03	2.80	3.80	523	1805	-	-	0.5	200	2.00	0.05
Total		2.06	9.41	20.4	27.69	1552	5340	1.0	400	2.0	800	76.0	2.0125
Grand Total		27.92	43.78	87.10	112.77	20152	69380	11.0	4400	11.5	4400	138.5	17.8875

## 6. AGROPROCESSING, MARKETING AND COMMUNICATION

Application of post harvest technology and agro-processing at farmers' level or in the rural area needs to be implemented so as to achieve maximum economic returns, through creation of infrastructure for communication, marketing and processing.

### 6.1 Rationale :

The zone contributes significant production of cereals, pulses, oilseeds, cotton and sugarcane. Cropped area accounted in cereals 54%, pulses 18%, cotton 15% and oilseeds 12%. The major crops grown are jowar, cotton, bajra, wheat and safflower. Productivity growth rates of 1.50, 1.02, 3.70 and 8.19 are being worked out for jowar in Sub-zones I, II, III and IV respectively. The development of processing industry based on the cropping pattern at Sub-zone level is being achieved only in case of sugarcane, cotton and to some extent in oilseeds. Pulses are processed in small scale to produce dal. It is essential to introduce processing industries based on sorghum as kharif sorghum is surplus in Sub-zone III and IV. Sorghum being similar in composition to maize, it could be processed in similar fashion. Marathwada Agricultural University has developed sorghum processing technology for products like starch, glucose syrup, malt based products (weaning foods, beer and sorghum flakes) which could be commercially applied. There is also scope to introduce more oil mills using cotton seed, soybean and sunflower as raw material. There is a need to modernise the traditional dal mills as well as home scale processing of dal by using hand operated machines. This will help farmers to produce value added products at home. A number of sugarmills are sick in the region due to mismanagement and reduced availability of sugarcane, particularly in Zone III. They need to be rejuvenated by Governmental assistance.



Zone 9 has an unique distinction of being a zone of horticultural development. The irrigated fruit crops, dryland fruit crops, vegetables, spices and condiments are in abundance in the zone. Sub-zonewise availability of the horticultural crops is as follows:

Sub-Zone I	Pomegranate, Figs, Ber, Grapes, Onion, Jamun, Bhendi (Okra), Tomato.
Sub-Zone II	Grapes, Guava, Pomegranate, Ber, Custard apple, Mango, Onion, Tomato, Cabbage, Cauliflower, Chillies.
Sub-Zone III	Mango, Banana, Citrus, Grapes, Pomegranate, Custard apple, Guava, Chiku, Onion, Chillies, Tomato.
Sub-Zone IV	Citrus (Orange), Banana, Chillies, Tomato.

There is no effective communication system and marketing facility for perishable fruits and vegetables. Only a few of fresh fruits are marketed in organised manner and about 1/3 fresh fruits and vegetables are spoiled due to improper post harvest handling in the country. There is need of cold storage chain for proper storage of fresh fruits and vegetables. The post harvest handling and processing of fruits and vegetables needs to be strengthened in the area. There is need to train the farmers for proper quality production of these perishable, proper harvesting, grading, standardization and pre-treatments to horticultural produce for increased shelf life. There is also need to carry-out research for development, of standards and grades, development of technologies for post harvest handling and processing of fruits and vegetable like pomegranate, ber, custard apple, figs and vegetables like onion, tomato and okra. Processing of fruits and vegetables could be done at farmers' level or as small scale units in rural area in order to preserve the surplus and to get better economical returns through value addition.

## 6.2 Approach :

In order to fulfill the objectives as per the proposed strategy, it is essential to approach in the following directions :

1. Development of infrastructure for communication and marketing.
2. Investigation into the development of appropriate post harvest technology through research.
3. Development of processing industry at farmers' level cooperative level or public and private sector level.

Based on these approaches and economic feasibility, it has been worked out that each Sub-zone needs to be developed in the following aspects of agro-processing. Though these projections are not based on demand and supply system; the availability of raw farm produce, fruits and vegetables was considered for agro-processing industries.

Sr. No.	Production Unit	Type of Unit	Capacity tons/day	Unit cost in Million Rs.
1	2	3	4	5
1.	Sorghum starch	Cooperative or Public sector or Private sector	15	0.3
2.	Sorghum liquid glucose	-do-	20	0.1
3.	Sorghum malt	Cooperative or Private	1 to 10	1 to 10
4.	Malted weaning food	Cooperative or Private or Home scale.	1 to 10	1 to 10
5.	Sorghum beer	Cooperative or Private	50,000' HL	0.8
6.	Sorghum flakes	Private/Coop.	0.5	0.05
7.	Dal Mill(Modern)	Cooperative or Private.	5	0.5

Contd...

1.	2	3	4	5
8.	Oilmill (Solvent Ext)	Cooperative or Private	100	100
9.	Dehydrated figs raisins, onion etc.	Farmers level Private Cooperative	0.5 2 100	0.1 1.0 10.0
10.	Processing fruits for juice, squash etc including pulp/pure	Private or Cooperative	1 to 15	1 to 10
11.	Candies, pickles etc and ketchups	Farmers level Private Cooperative	0.5 2 25	0.5 1.5 10.0
12.	Jam, Jellies ketchup etc.	Farmers level Private Cooperative	0.5 2 25	0.5 1.5 10.0
13.	Banana fibre cotton stalk Board, pectin from sunflower, fuel bricks from Agril. waste.	Private	1	1.0
14.	Cattle feed Unit	Cooperative	10	5.0
15.	Leather tanning Unit	-do-	1	5.0
16.	Slaughter house and meat process- ing	-do-	5	5.0

There is also need to establish cold storage chain i.e. at least one cold store in each district on either cooperative basis or as public sector unit with unit cost of Rs. 50 lakh each. It is also essential to establish post harvest technology research centres in each of the agricultural universities in Sub-zones. The unit cost of each centre at initial stage would be around Rs. 30 lakhs.

### 8.3 Line of action :

For achieving the targeted agro-industrial development in the zone, following actions need to be initiated.

1. Establishment of communication and marketing infrastructure:

It is essential to develop road and rail communication, particularly in Sub-Zone III and IV.

The metergauge line needs to be converted into broad gauge for convenient transport of perishable fruits and vegetables. The establishment of cold storage chain in zone will be as follows:-

Zone	No. of cold storage	Cost (Rs. in Million)	Cost for VIII Plan
Sub-zone I	3	15.0	10.0
Sub-Zone II	5	25.0	15.0
Sub-Zone III	21	105.0	65.0
Sub-Zone IV	4	20.0	10.0
Total	33	165.0	100.0

Out of the 33 cold storage, 20 are proposed to be established during VIII Five Year Plan and remaining in the IX Five Year Plan. There will be need of about Rs. 100 m in the VIII Five Year Plan.

2. Establishment of Post Harvest Technology and Agro-Processing Research Centres :

It is proposed to establish four Regional Research Centres in the Four Agricultural Universities during VIII Five Year Plan.

The cost of each centre at initial stage would be Rs. 10 lakh for infrastructure and Rs. 20.00 lakh for staff salaries. The total cost would be Rs. 1.2 crores.

### 3. Establishment of Agro-Processing Units :

As discussed under approach to the VIII Five Year Plan, a number of agro-processing units could be established. The Sub-zonewise distribution of these units for VIII Five Year Plan would be as follows:-

Zone 1	Type of Unit 2	No. 3
Sub-Zone I	Sorghum processing starch	1
	Liquid glucose	1
	Beer	1
	Fruit & Vegetable processing	5
	Oilmill(Solvent Ext.)	2
	Dalmill(Modern)	2
	Leather tanning	2
	Slaughter house and meat processing	1
	Cattle feed	2
Sub-Zone II	Sorghum starch	1
	Liquid glucose	1
	Beer Unit	1
	Fruit & Vegetable processing Unit	10
	Sorghum flakes	10
	Cattle feed Unit	1
Sub-Zone III	Sorghum starch	2
	Liquid glucose	2
	Beer Units	2
	Fruit & Veg.processing Unit	25
	Sorghum flake	25
	Oilmills	5
	Dalmills	5
	Cattle feed	2

1	2	3
Sub-Zone IV	Sorghum starch	1
	Fruit & Veg. processing Units	10
	Sorghum flakes	15
	Cattle feed	1

Sub-zonewise total funds required for agro-processing in VIII Five Year Plan.

Sub-Zone	Amount required in Million Rs.
Sub-Zone I	260.0
Sub-Zone II	145.5
Sub-Zone III	506.3
Sub-Zone IV	55.8
Total	967.6

#### 4. Entrepreneurial Training programme in Agro-Processing :

Four centres of entrepreneurial training are proposed in the zone. These would be located in Agricultural Universities under each sub-zone. The training programme will include technical training regarding processing as well as entrepreneurial development. An amount of Rs. 8.80 million is required for four such centres in the zone. Two centres may be developed during VIII Five Year Plan with a financial outlay of Rs. 4.4 million. Total number of entrepreneurs to be trained in each Sub-zone would be about 200 per year with a batch of 20 in each group with one month duration of training. The number of entrepreneurs proposed to be trained during VIII Five Year Plan would be 1,000 in each Sub-zone.

Sub-Zone	No. of Insti.	Investment required for Insti. in Rs. lakh	Investment in VIII Plan in Rs. lakh
Sub-Zone I	1	22	-
Sub-Zone II	1	22	22
Sub-Zone III	3	66	22
Sub-Zone IV	1	22	-
<b>Total</b>	<b>6</b>	<b>132</b>	<b>44</b>

#### 6.4 Institutional mechanism :

It is essential to involve Regional Development Corporations for establishment of marketing infrastructure. Coordinated efforts of District Industrial Centres, National Cooperative Development Council, State Finance Corporations and Banks through single window service package is needed. Agricultural produce processing corporations should provide technical, marketing and financial assistance to the farmers for processing and storage of agricultural produce. There is need to develop regulated markets for fruits and vegetable on the lines of grains. T & V system of Department of Agriculture needs to be strengthened by introducing subject matter specialists on agro-processing at each of the district level units. Cold storages, if established under public sectors, needs to be managed by organisation like MAFCO. The agricultural products processed at farmers level or under Cooperative sectors, need to be marketed under strict quality large scale private sectors.

It is essential to give 25% subsidies on machineries for processing highly perishable commodities like onion by the farmers if they use solar drier or any other non conventional energy source. The sales tax holiday for five years could be given to the processors at small scale level if they start units in rural areas. Import of sophisticated machine by cooperative unit should be duty free and with reduced duty for private entrepreneurs if the unit is started in the rural area.

#### 6.5 Funding of the programme :

National Cooperative Development Council, NABARD, ICICI, NAFED, State Finance Corporations, SICOM, Nationalised Banks and other similar agencies can come forward for providing the funds for agricultural processing units. State Government and ICAR should provide funds for strengthening agricultural universities to carryout work on post harvest technology.

#### 6.6 Physical targets for VIII Plan in Agro-processing :

Based on the raw material availability, physical facilities and marketing, the strategy for agro-processing development of zone 9 has been prepared. The strategy involves development of R and D base in each sub-zone, establishment of cold storage chain, establishment of entrepreneurial training centres and Agro-processing units in each sub-zone. In order to formulate districtwise physical targets, the basis for selection of particular activity in the district is the raw material availability, market and necessity of the area for agro-processing. The districtwise physical targets for agro-processing units, installation of cold storage, establishment of research centres and training centres are shown in Table 1, 2 and 3 respectively.



Table 1: Districtwise agro-industrial units and investments

Zone District	Product	Investment (Million Rs.)		
<u>MAHARASHTRA</u>				
Zone-I	Kolhapur	Sorghum starch unit(1)	30	
		Liquid glucose unit (1)	10	
		Fruit and Veg.processing Unit(1)	2	
		Modern dalmill (1)	5	
		Cattle feed unit (1)	5	
		Satara	Beer Unit (1)	80
			Fruit and Vet.Processing Unit(1)	2
			Oilmill(Solvent ext.)(1)	100
			Leather tanning (1)	5
			Slaughter house and meat processing (1)	5
		Nasik	Fruit and Veg.processing Unit(1)	2
		Pune	Fruit and Veg.processing Unit(1)	2
			Modern Dal Mill(1)	5
	Zone-II	Solapur	Sorghum starch unit (1)	30
		Liquid glucose unit (1)	10	
		Fruit & Veg.Processing Units(3)	2	
		Sorghum flakes (2)	0.10	
		Ahmednagar	Beer Unit (1)	80
			Fruit & Veg.Processing Units(3)	6
			Sorghum flakes(2)	0.10
Zone II	Sangli	Fruit & Veg.Processing Units(2)	4	
		Sorghum flakes (3)	0.15	
		Dhule	Fruit & Veg.Processing Units(2)	4
			Sorghum flakes (3)	0.15
			Cattle Feed Unit (1)	5.00

Zone	District	Product	Investment (in million Rs.)
1	2	3	4
Zone-III	Latur	Sorghum starch Unit(1)	30
		Liquid glucose Unit(1)	10
		Fruit & Veg.Processing Unit(2)	4
		Sorghum flakes(2)	0.10
		Modern dal mill (1)	0.50
	Aurangabad	Sorghum starch unit (1)	30
		Liquid glucose Unit (1)	10
		Fruit & Veg.Processing Unit(3)	6.00
		Sorghum flakes (2)	0.10
	Parbhani	Beer Units (1)	80
		Fruit & Veg.Processing Unit(1)	2.00
		Sorghum flakes(2)	0.10
		Modern dal mill(1)	0.50
	Amravati	Beer Unit (1)	80
		Fruit & Veg.Processing Units(2)	4.00
		Sorghum flakes (2)	0.10
		Modern dal mill(1)	0.50
	Beed	Fruit & Veg.Processing Unit(1)	2
		Sorghum flakes(1)	0.05
		Oilmill(Solvent Ext.)(1)	100.00
Cattle feed (1)		5.00	
Zone III	Osmanabad	Fruit & Veg.Processing Unit(1)	2.00
		Sorghum flakes(2)	0.10
		Oilmill (Solvent ext.)(1)	100.00
Buldhana		Sorghum flakes(1)	0.05
		Fruit & Veg.Processing Unit(1)	2.00
		Sorghum flakes (1)	0.05
		Oilmill (Solvent ext.)(1)	100.00

1	2	3	4
	Akola	Fruit & Veg.Processing Unit(1)	2.00
		Sorghum flakes (1)	0.05
		Cattle feed (1)	5.00
	Jalgaon	Fruit & Veg.Processing Units(2)	4.00
		Sorghum flakes (1)	0.05
	Jalna	Sorghum flakes (2)	0.10
Zone-IV	Yeotmal	Sorghum starch(1)	30.00
		Fruit & Veg.Processing Units(2)	4.00
		Sorghum flakes (7)	0.35
		Cattle feed (1)	5.00
	Nanded	Fruit & Veg.Processing Units(3)	6.00
		Sorghum flakes (3)	0.15
	Nagpur	Fruit & Veg.Processing Units(3)	6.00
		Sorghum flakes	0.15
	Wardha	Fruit & Veg.Processing Units(2)	4.00
		Sorghum flakes (2)	0.10

MADHYA PRADESH

Zone- I	Jhabua	Fruit & Veg.Processing Unit(1)	2.00
		Oilmill (Solvent ext.)(1)	100.00
Zone-II	Indore	Fruit & Veg.Processing Unit(1)	2.00
		Sorghum flakes (1)	0.05
		Oilmill (Solvent Ext.)(1)	100.00
	Dhar	Fruit & Veg.Processing Unit(1)	2.00
		Sorghum flakes (1)	0.05
	Ratlam	Fruit & Veg.Processing Unit(1)	2.00
		Sorghum flakes (1)	0.05
		Modern Dalmill (1)	0.50
	Khargaan	Fruit & Veg.Processing Unit(1)	2.00
		Sorghum flakes (1)	0.05

1	2	3	4
	Mandsaur	Fruit & Veg.Processing Unit(1)	2.00
		Sorghum Flakes (1)	0.05
	Dewas	Fruit & Veg.Processing Unit(1)	2.00
		Sorghum Flakes (1)	0.03
		Modern DalMill (1)	0.50
	Shajapur	Fruit & Veg.Processing Unit(1)	2.00
		Sorghum Flakes (1)	0.05
Zone-III	Rajgarh	Fruit & Veg.Processing Unit(1)	2.00
		Sorghum Flakes (1)	0.05
	Ujain	Fruit & Veg.Processing Unit(1)	2.00
		Sorghum Flakes (1)	0.05
		Oilmill (Solvent Ext.)(1)	100.00
<u>RAJASTHAN</u>			
Zone-III	Jhalwar	Fruit & Veg.Processing Unit(1)	2.00
		Sorghum flakes (1)	0.05

Table 2: Establishment of Cold storage during VIII Plan

State & Sub-zones	Districts	No.	Amount in million Rs.
<u>MAHARASHTRA</u>			
Sub-Zone- I	Kolhappr	1	5.0
	Nasik	1	5.0
Sub-Zone-II	Solapur	1	5.0
	Ahmednagar	1	5.0
	Dhule	1	5.0
Sub-zone-III	Aurangabad	1	5.0
	Parbhani	1	5.0
	Latur	1	5.0
	Beed	1	5.0
	Buldhana	1	5.0
	Amravati	1	5.0
	Jalgaon	1	5.0
	Akola	1	5.0
Sub-Zone-IV	Nanded	1	5.0
	Yeotmal	1	5.0
<u>MADHYA PRADESH</u>			
Sub-Zone-III.	Indore	1	5.0
	Ratlam	1	5.0
	Shajapur	1	5.0
	Rajgarh	1	5.0
<u>RAJASTHAN</u>			
Sub-Zone III	Jhalwar	1	5.0

Table 3: Establishment of Regional Research Centres for Post Harvest Technology and Agro-processing

State and Sub-zone	District	Amount in Million Rs.
<u>MAHARASHTRA</u>		
Sub-Zone- I	Pune	3.00
Sub-Zone-III	Aurangabad	3.00
Sub-Zone-IV	Nagour	3.00
<u>MADHYA PRADESH</u>		
Sub-Zone-III	Indore	<u>3.00</u>
	Total	<u>12.00</u>

Establishment of Training Institutes in Agro-Processing during VIII Plan.

State and Sub-zone	District	Amount in Million Rs.
<u>MAHARASHTRA :</u>		
Sub-Zone- II	Ahmednagar	2.2
Sub-Zone-III	Parbhani	2.2
	Total	<u>4.4</u>

## 7. FORESTRY AND FODDER PRODUCTION

The forest wealth is one of the most important assets of tropical countries. In India, the total forest area is about 20% of the total geographical area as against 33% which is required to meet the ecological and economic needs. The total forest area in Zone 9 is 3.64 m ha (11% of geographical area) which comprises 5% of the total forest area of India. Permanent pastures are spread over an area of 2.2 m ha in this zone. The forest produce and by-products such as timber, poles, fuel-wood, bamboo, fodder leaves and grasses, gum and tendu leaves are significantly affecting the economy of dwellers. The forests are instrumental in controlling soil erosion in Sub-zone I and flood control and reduction in environmental pollution in Sub-zone I.

### 7.1 Rationale :

The forest area in the Zone-9 is only 11% of the total geographical area. In Sub-zone I, II, III and IV, the forest area is 13.38, 14.54, 8.31 and 14.50 per cent respectively. The forest is mostly concentrated at high altitude areas of sub-mountainous regions of Satpura, Satmala, Vindhyachal ranges and hills. However, the forest density is relatively less in the plains of Godawari, Bheema, Krishna, Tapi and Narmada river basins. Non-coniferous forest types are only dominating in the zone. The major forest area is owned by the State Governments, with negligible forest area under private sector.

In all the sub-zones Neem, Hiwar, Karwand, Acacia, Ber, Tamarind, Annona, Palas and Tendu species are very common with the exception of commercial teak wood grown in large part of Sub-zone IV and some part of Sub-zone III. Bamboo, Jambhul, Anjan etc species are grown on the banks of nalas and rivers. Eucalyptus, casuriana and subabul species are becoming popular in all the sub-zones after the introduction of social forestry programme.

The livestock density is 35.83, 35.18, 16.42 and 16.83 per cent whereas the area under permanent pastures is 0.34, 0.17, 1.43 and 0.29 m ha, in the Sub-zone I, II, III and IV, respectively. In the scarcity Sub-zone the severity of fodder problems is more due to high density of livestock and limited availability of area for fodder production (only 3.1% of total geographical area). Most of the pastures in the zone are degraded due to over-grazing. Thus, forestry and fodder production are to be interlinked with dryland horticulture and livestock nutrition.

### 7.2 Approach :

The major area of the zone is over burdened by food grain production and there is very limited scope to bring new area under forests except waste lands, problematic, degraded and marginal lands. Similarly, there is less scope to bring additional area under pastures. Thus the situation warrants to increase the area under tree cover by natural regeneration, coppicing and afforestation on roadsides, waste land and common lands in social forestry programmes and on marginal and agricultural lands in agro-forestry programmes. In coming 20 years, the area under forestry should be increased four times in the hills sub-zone and two times in other Sub-zones. Along with the forests, the area under pastures should also be increased under silvipastoral system. This can be achieved in phases. The programme planned for VIII Plan is indicated in Table 1.

### 7.3 Line of Action :

1. The area under forests in Zone 9 will be increased by afforestation in wasteland and community area available for this purpose. The fodder grasses and fodder trees can be grown under silvipastoral system.
2. It is needed to plant trees in the degraded forests and non-viable agricultural land. On the agricultural land,



tree planting on field boundaries, on bunds and river (nala) banks can be done. The windbreaks, and shelter belts can be established. In the fields, the hedge rows on contour lines can be established. The farmers should be given incentives in the form of subsidies for tree planting.

3. The tree cover should be increased by afforestation and other tree planting under social forestry, Jawahar, Panchayat Raj and Horticultural Development programmes.

4. The degraded pastures should be improved by proper care and management with controlled grazing.

5. The training centres for the farmers and other people (rural and urban) will be established. In Sub-zone III, four such centres and one each in other Sub-zones will be established. Each Centre should have about 100 ha instructional farm with different agro-forestry systems and multi-purpose trees should be established. For each training centre an amount of 5 million rupees will be required.

6. The forest nurseries should be established for each district in all the Sub-zones to provide seedlings of different forest species of superior types. For establishing each nursery, an amount of Rs. 1 million will be required. These nurseries will primarily multiply the foundation material for supplying to State Forest Nurseries for further multiplication on commercial scale.

7. The teaching, research and extension education in forestry should be strengthened under each Agricultural University. Centres for research and education should be established. One centre each for Sub-zone I, II, and IV and four centres for Sub-zone III, thus, in all seven centres in the zone should be established. For each centre, an amount of Rs. 5 million should be provided in the plan.

8. For increasing the area and production of fodder, systematic efforts are required. For this purpose seed production programme of grasses and fodder trees is essential. For increasing production and strengthening research and training, there should be provision of additional funds. The seed production and distribution in respect of fodder species stylo hamata, anjan and trees like Bahunia species, Louceana species, Anjan, Susbenia, Ficus species etc should be undertaken. The seedlings of tree species should be made available to the farmers.

9. Forest based industries like lac, gum, paper and pulp, neem cake, bamboo baskets, bidi making, sericulture, apiculture, etc, should be further strengthened.

10. For avoiding further deforestation and for efficient utilization of fodder, machinery for using alternate sources of energy (bio-gas, solar cookers, etc) and for the treatment of fodder (chaff cutters, etc) should be made available at subsidized rates to farmers and other concerned people.

#### 7.4 Institutional arrangements :

Afforestation and other forestry programme will be implemented by the State Government through the Department of Forestry and Social Forestry and Horticulture. For afforestation programme, the budget @ Rs. 10,000/ha (as per the norms of State Department of Social Forestry) will be required. The Agricultural Universities will undertake forest teaching, research and extension along with nursery and tree multiplication programme. The detail layouts of training and research in forestry and fodder production are given in Table 2.

### 7.5 Financial implications :

The budget requirement of the State Departments of Forestry and Social Forestry and Horticulture should be provided by the respective State Governments. Additional budget of Rs. 433 million required for training, research and extension education should met through ICAR and State Governments. Out of Rs. 433 m, the ICAR should provide Rs. 178 for research and training and the State Governments should provide Rs. 255 m for the demonstrations, subsidies to farmers and other extension work. The NABARD and Nationalised as well as Commercial Banks should come forward for financing the farmers for tree planting programmes and to cooperative societies for running forest based industries.

Maharashtra covers only 17.4% area under forest which is below the national average. Particularly major part of plateau with medium black soils needs tree cover to meet the ecological balance in nature. Considering the present status of information on forest and pasture it is projected that 13.2 and 713 lakh hectares of area from 22 districts of Maharashtra should be brought under forests and pastures respectively during the VIII Plan. The various approaches to bring the area under tree cover and under pastures are suggested in earlier paras in the main strategies on forest and fodder development in Zone-9. The districtwise physical targets for forest and pasture development and employment generation during VIII & Five Year Plan in Zone 9 are given in Table 3. The possible fuelwood requirements and availability of fuel wood are tabulated in Table 4 for 22 districts of Maharashtra State covered in Zone-9.

Table :1: Present area, projections and budget requirement in VIII Five Year Plan for Forestry and Fodder Production.

(Rs. in millions)

Sr.No.	Sub-Zone	Total geographical area (m ha)	Present area under (84-85)		Proposed increment in area			Investment			Permanent Pastures			
			Forest (mha)	pasture (m ha)	Up to Forest (m ha)	pasture (m ha)	Increase during VIII Plan Forest (m ha)	Pastures (m ha)	Forests Development * (Rs. in millions)	Training & Res. ++ (Rs. in millions)	Total (Rs. in millions)	Development ** (Rs. in millions)	Training & Res. ++ (Rs. in millions)	Total (Rs. in millions)
1.	I	5.68	0.76 (13.38)	0.34 (6.00)	1.20 (21.12)	0.50 (8.80)	0.44 (7.75)	0.16 (2.82)	4400	40	4440	800	22.5	822.5
2.	II	5.50	0.80 (14.54)	0.17 (3.10)	1.00 (18.20)	0.34 (6.20)	0.20 (3.64)	0.17 (3.10)	2000	34	2034	850	24.0	874.0
3.	III	18.04	1.50 (8.31)	1.43 (7.92)	2.50 (13.86)	2.00 (11.10)	1.00 (5.54)	0.57 (3.16)	10000	166	10166	2850	93.5	2943.5
4.	IV	4.00	0.58 (14.50)	0.29 (7.25)	0.80 (20.00)	0.41 (10.25)	0.22 (5.50)	0.12 (3.00)	2200	34	2234	600	19.0	619.0
<b>Total :</b>		<b>33.22</b>	<b>3.64 (10.9)</b>	<b>2.23 (6.71)</b>	<b>5.50 (16.55)</b>	<b>3.25 (9.78)</b>	<b>1.86 (5.60)</b>	<b>1.02 (3.07)</b>	<b>18600</b>	<b>274</b>	<b>18874</b>	<b>5100</b>	<b>159.0</b>	<b>5259.0</b>

+ Figures in parentheses indicate the per cent of the total geographical area.

\* @ Rs.10,000/ha (as per the norms of State Department of Social Forestry)

\*\*@ Rs. 5,000/ha                    -do-                    -do-                    -do-

++ The details are given in Table-2.

Table :2: The details of amount required for the training and research for the forestry and fodder production in VIII Five Year Plan.

(Rs. in million).

Sr. No.	Particulars	Sub-zones				Total.
		I	II	III	IV	
<b>A) FORESTRY :</b>						
1.	Training units total 7 units in the zone @ Rs.5 m/unit.	5	5	20	5	35
2.	Establishment of forests nurseries to produce foundation material. Total 34 nurseries in the zone @ Rs.1 m/nursery.	5	4	21	4	34
3.	Demonstrations, other extension work & subsidies to farmers and other tree growers @ Rs. 5 m/district.	25	20	105	20	170
4.	Strengthening of research units at 7 centres in the zone @ Rs.5 m/centre.	5	5	20	5	35
Total(A):		40	34	166	34	274
<b>B) FODDER PRODUCTION :</b>						
1.	Training and research centres total 8 centres in the zone @ Rs.5 m/centres.	5	10	20	5	40
2.	Fodder trees & grass seed production and supply @ Rs.1 m/district.	5	4	21	4	34
3.	Lemonstrations, other extension work & subsidies to the farmers @ Rs.2.5 m/district.	12.5	10	52.5	10	85
Total (B):		22.5	24	93.5	19	159
GRAND TOTAL (A+B) :		62.5	58	259.5	53	433

Table-3: District-wise physical targets in Forest and Pasture Development during VIII Five Year Plan in Zone 9

Sr. No.	Sub-Zone & district.	Area '000' ha.			Investment Rs. in Million			Employment man days in m.		
		Area to be covered.	Investment.	Employment generation.	Area to be covered.	Investment.	Employment generation.			
1.	2.	3.	4.	5.	6.	7.	8.			
<b>MAHARASHTRA STATE :</b>										
<b>I. Hills Zone</b>										
1.	Nasik	100	1000	45.0	40	200	6.0			
2.	Kolhapur	80	800	36.0	30	150	4.5			
3.	Satara	80	800	36.0	30	150	4.5			
4.	Pune	100	1000	45.0	40	200	6.0			
Total:		360	3600	162.0	140	700	21.0			
<b>II. Scarcity Zone :</b>										
5.	Sangli	30	300	13.5	40	200	6.0			
6.	Solapur	30	300	13.5	40	200	6.0			
7.	Ahmednagar	60	600	27.0	40	200	6.0			
8.	Dhule	20	800	36.0	50	250	7.5			
Total:		200	2000	90.0	170	850	25.5			
<b>III. Plateau zone with M.B. Soil :</b>										
9.	Aurangabad	50	500	22.5	30	150	4.5			
10.	Beed	50	500	22.5	30	150	4.5			
11.	Jalna	40	400	18.0	20	100	3.0			
12.	Parbhani	40	400	18.0	20	100	3.0			
13.	Osmanabad	60	600	27.0	40	200	6.0			
14.	Latur	50	500	22.5	30	150	4.5			
15.	Buldhana	60	600	27.0	30	150	4.5			
16.	Amravati	80	800	36.0	40	200	6.0			
17.	Akola	50	500	22.5	30	150	4.5			
18.	Jalgaon	60	600	27.0	30	150	4.5			
Total:		540	5400	243.00	300	1500	45.0			

Contd.

Contd.

1.	2.	3.	4.	5.	6.	7.	8.
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IV. Plateau Zone with D.B. soils :

19. Nandedi	50	500	22.5	30	150	4.5
20. Yeotmal	70	700	31.5	40	200	6.0
21. Nagpur	60	600	27.0	30	150	4.5
21a. Warcha	40	400	18.0	20	100	3.0
Total:	220	2200	99.0	120	600	18.0

MADHYA PRADESH :I. Hills zone

22. Zhabua	80	800	36.0	20.0	100	3.0
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III. Plateau Zone with M.B. soil :

23. Indore	50	500	22.5	30	150	4.5
24. Lhar	40	400	18.0	20	100	3.0
25. Khargaon	50	500	22.5	30	150	4.5
26. Mandsour	50	500	22.5	20	100	3.0
27. Ratlam	40	400	18.0	20	100	3.0
28. Dewas	50	500	22.5	30	150	4.5
29. Shajapur	40	400	18.0	20	100	3.0
30. Rajgarh	30	300	13.5	20	100	3.0
31. Ujjain	30	300	13.5	20	100	3.0
32. Khandwa	40	400	18.0	30	150	4.5
Total:	420	4200	189.0	240	1200	36.0

RAJASTHAN :III. Plateau with M.B. soil :

34. Jhalwar	40	400	18.0	30	150	4.5
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Grand Total:	1860	18600	837.0	1020	5100	153.0
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N.B. The employment generation is calculated on the basis of 450 man days per year per hectare and 150 man days per year per hectare for the development of forest and pasture respectively.

Table:4: Fuel wood requirement during VIII Five Year Plan in Zone 9 (Maharashtra State).

Sr. District No.	Population during the plan period (lakh)	Total No. of families (lakh)	No. of families using fuel wood (lakh).	Fuel wood requirement (lakh m.t.)	
1.	2.	3.	4.	5.	6.
<b>I. Hills zone :</b>					
1. Nasik	35.88	7.176	5.382	13.779	
2. Kolhapur	29.52	5.904	4.428	11.335	
3. Satara	24.48	4.896	3.672	9.400	
4. Pune	49.92	9.984	7.488	19.169	
<b>Total :</b>					
	139.80	27.96	20.97	53.683	
<b>II. Scarcity Zone :</b>					
5. Sangli	21.96	4.392	3.294	8.432	
6. Solapur	31.08	6.216	4.662	11.934	
7. Ahmednagar	32.52	6.504	4.878	12.487	
8. Dhule	24.60	4.92	3.690	9.446	
9.					
<b>Total:</b>					
	110.16	22.032	16.524	42.299	
<b>III. Plateau zone with M.B. soil :</b>					
9. Aurangabad	19.08	3.816	2.862	7.326	
10. Beed	16.92	3.384	2.538	6.497	
11. Jalna	12.36	2.472	1.854	4.746	
12. Parbhani	19.68	3.936	2.952	7.557	
13. Osmanabad	12.36	2.472	1.854	4.746	
14. Naur	15.48	3.096	2.322	5.944	
15. Buldhana	18.12	3.624	2.718	6.958	
16. Amravati	22.32	4.464	3.348	8.570	
17. Akola	21.84	4.368	3.276	8.386	
18. Jalgaon	31.44	6.288	4.716	12.072	
<b>Total :</b>					
	189.60	37.920	28.440	72.802	
<b>IV. Plateau zone with D.B. Soils :</b>					
19. Nanded	20.88	4.176	3.132	8.017	
20. Yeotmal	20.88	4.176	3.132	8.017	
21. Wardha	11.16	2.232	1.674	4.285	
22. Nagpur	31.08	6.216	4.662	11.934	
<b>Total :</b>					
	84.00	16.800	12.600	32.253	
<b>GRAND TOTAL :</b>					
	523.56	104.712	78.534	201.037	

N.B. Annual fuel wood requirement is estimated assuming 75% families will use fuel wood @ 2.56 M.T. per year per family.



LIST OF THE MEMBERS

1. Dr. P.V. Salvi, Chairman  
Vice-Chancellor,  
Marathwada Agricultural University,  
Parbhani-431 402 (Maharashtra)

M E M B E R S

2. Vice-Chancellors of other Agricultural Universities in the Zone.
- i) Dr. N.G. Perur,  
Vice-Chancellor,  
Mahatma Phule Agril. University,  
Rahuri, Dist. Ahmednagar.  
Maharashtra (413 772.)
- ii) Prof. H.B. Ulemale,  
Vice-Chancellor,  
Punjabrao Krishi Vidyapeeth,  
Krishinagar, Akola-444 104 (Maharashtra).
- iii) Dr. L.K. Sharma,  
Vice-Chancellor,  
J.N.K.V.V., Jabalpur  
(Madhya Pradesh).
- iv) Dr. K.M. Nag,  
Vice-Chancellor,  
Rajasthan Agricultural University  
Bikaner, (Rajasthan).
3. APCs and Agriculture Secretaries of the Zone
- i) Shri T. Balraman,  
Secretary  
Agriculture, Animal Husbandry, Dairy  
Development and Fisheries Department  
Government of Maharashtra  
Mantralaya Annexe  
Bombay-400 032.
- ii) The Agriculture Production Commissioner,  
Madhya Pradesh, Bhopal.
- iii) Secretary (Agriculture)  
Government of Rajasthan  
Jaipur (Rajasthan).
4. Secretaries, Animal Husbandry in the Zone :
- i) The Secretary  
Animal Husbandry  
Government of Maharashtra  
Mantralaya, Bombay-400 032.

ii) The Secretary,  
Animal Husbandry  
Government of Madhya Pradesh  
Bhopal.

iii) The Secretary  
Animal Husbandry  
Government of Rajasthan  
Jaipur (Rajasthan).

5. Chief Conservators of Forests in the Zone :

i) Shri V.K. Prabhu, IFS,  
Chief Conservator of Forests (Production),  
Maharashtra State  
Jaika Motors Building  
Civil Lines, Sadar,  
Nagpur - 440 001.

ii) The Chief Conservator of Forests  
Madhya Pradesh  
Bhopal (Madhya Pradesh).

iii) The Chief Conservator of Forests,  
Rajasthan  
Jaipur (Rajasthan)

6. State Secretaries, Irrigation in the Zone :

i) The Secretary  
Department of Irrigation  
Government of Madhya Pradesh  
Bhopal (Madhya Pradesh).

ii) The Secretary  
Department of Irrigation  
Government of Maharashtra  
Mantralaya, Bombay-400 032.

iii) The Secretary  
Department of Irrigation  
Government of Rajasthan  
Jaipur (Rajasthan).

7. Representative of Coop. Land Development Bank  
in the Zone :

i) Shri A.D. Wassave,  
Managing Director  
Maharashtra State Co-operative Land  
Development Bank Ltd.,  
Plot No.15-A  
Morvi Lane, Chowpatty,  
Bombay-400 007.

8. Representative of NABARD :

i) Shri G.K. Agrawal  
Deputy General Manager  
54. Wellesley Road

9. Representatives of NGOs concerned with crop fruit plantation/rural development in the region :

i) Shri S.P. Salunke  
Gram Gaurav Pratishthan  
P.B.No.1202  
67, Hadapsar Industrial Estate  
Pune-411 013 (Maharashtra).

ii) Prof. V.M. Dendekar  
'KUNANUBANDH'  
820/2, Shivaji Nagar  
Pune-411 004 (Maharashtra).

10. Representative of the Planning Commission :

i) Dr. Y.K. Alagh  
Member (Agriculture)  
Planning Commission  
Yojana Bhavan  
NEW DELHI - 110 001.

ii) E.R.D.N. Basu, Consultant  
(Planning Commission)  
Sardar Patel Insti. of Economic  
and Social Research, Thaltej Rd  
Ahmedabad-380 054.

11. Representative of the ICAR :

i) The Director  
Central Institute for Cotton Research (ICAR)  
Post Bag. No.125  
GPO, Nagpur - 440 001.

12. Representative of the Department of Agriculture:

i) Dr. A.N. Singh, J.C. (Cc),  
Department of Agriculture and  
Cooperation, Ministry of Agriculture  
and Cooperation  
Krishi Bhavan, New Delhi.

ii) Dr. T.V. Kathane  
Director  
Directorate of Cotton Development  
Department of Agriculture and  
Cooperation, Ministry of Agriculture  
and Cooperation  
Krishi Bhavan, New Delhi.

iii) Dr. R.L. Karale  
Head BRSSC  
NBSS & LUP Campus  
Shankarnagar PO Amraoti Road  
Nagpur.

13. Representative of the Ministry of Water Resources:

i) Shri O.P. Sehgal  
Superintending Engineer  
Godavari Mahanadi Circle  
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1st Floor, Chirag Ali Lane  
HYDERABAD-500 001.

14. Shri D.V. Nerurkar  
Director, Director of Social Forestry  
Nagpur (Maharashtra), Under ground Central Building

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15. Dr. P.A. Deshmukh Secretary  
Director of Research  
Marathwada Agril., University  
Parbhani-431402.
16. Dr. R.S. Lashpande, Joint Secretary  
Ghokhale Institute of Politics & Economics  
Pune-4.

WORKING GROUP (ZONAL PLANNING TEAM), MARATHWADA  
AGRICULTURAL UNIVERSITY, PARBHANI.

- |     |                  |  |   |
|-----|------------------|--|---|
| 1.  | Dr.P.V. Salvi    | Vice-Chancellor                                    | Marathwada Agril.<br>University,<br>Parbhani. |
| 2.  | Dr.P.A. Deshmukh | Director of<br>Research.                           | -do-  |
| 3.  | Dr.G.U.Malewar   | Head,Department<br>of Soil Science<br>& Chemistry. | -do-  |
| 4.  | Dr.M.A.Gaffar    | Professor of<br>Animal Nutrition.                  | -do-  |
| 5.  | Dr.V.R.Chakrawar | Head, Department<br>of Horticulture.               | -do-  |
| 6.  | Dr.B.W.Ashturkar | Head,Department<br>of Economics &<br>Statistics.   | -do-  |
| 7.  | Dr.V.B.Shelke    | Head, Department<br>of Agronomy.                   | -do-  |
| 8.  | Dr.D.N.Kulkarni  | Head, Department<br>of Food Science.               | -do-  |
| 9.  | Dr.H.S.Acharya   | Reader in<br>Mathematics                           | -do-  |
| 10. | Dr.P.R.Narwadkar | Officer Incharge<br>Agro-Forestry<br>Scheme.       | -do-  |