Ad-hoc Study No.45

FALLOW LAND IN MADHYA PRADESH - EXTENT AND REASONS

(Study conducted in Chhatarpur and Mandla Districts of M.P.)

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CHAPTER I

I N T R O D U C T I O N

1.1 Land - A Scarce Resource

The most important thing to be remembered about agriculture is its relation to and its dependence on nature. Of all the productive enterprises, agriculture utilises the natural resources most. In fact, without natural resources no agricultural operation could be possible. Land is the most important of these natural resources. Man can not create land. Its supply in relation to global surface is almost fixed. New opportunities placed before man by scientific developments may mitigate the limited character of land in terms of its productivity per unit, but the fact remains that the supply of land in physical terms is limited. By and large, land constitutes the most important factor of production in agriculture.

The demand for food and other farm products rises with the growth of population and economic progress. An ever-increasing demand for agricultural products accentuates the scarcity of land. The population pressure on land is increasing and the cultivable land is limited. This necessitates full use of all available cultivable land. Its limited area and its importance as an essential factor of production have conferred on it the status of a national asset. Therefore, the States have adopted various measures for the protection and improvement of land through land reclamation, soil conservation and enactments relevant to its proper management in the national interest.

1.2 Land Use in India

In regard to land area per capita, taking a world view, India is not very happily placed. India shares 15 per cent of the total world population but has only 2.45 per cent of the total land. The area of arable land per capita is 0.31 hectares whereas it is 36.70 hectares in Australia. Comparative position of land per capita (hectares) in other countries is 7.02 in Argentina, 2.99 in Canada 2.38 in U.S.S.R. and 2.0 in U.S.A.*

Our country being essentially an agricultural country, our popular land classification is based on agricultural uses. Agriculture or more specifically crop production is by far the most important use of land in India.

The total geographical area of India is 304.90 million hectares. Of this 142.61 million hectares or 46.77 per cent is net area sown. Fallow land measures 22.86 million hectares or 7.50 per cent. There also exist 16.92 million hectares (5.55 per cent) of cultivable waste land. Thus the total potential of culturable land in the country in 182.39 million hectares. Again about 75 per cent of the net area sown being monocropped vast area of land remains as seasonal fallow during kharif and rabi seasons. However, in view of the high degree of dependence on agricultural land and lower productivity the proper and intensive utilisation of the available cultivable land in the country assumes a great importance.

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*Ref. Indian Agriculture in Brief (16th Edition), Directorate of Economics and Statistics G.O.I. Page 266-267. Source : FAO Production Year Book 1975.

1.3 Land Use in Madhya Pradesh

Madhya Pradesh is primarily an agricultural State as agricultural sector is the mainstay of the state economy. Eighty four per cent of the population is rural and three quarters of its working population is directly engaged in agriculture. Being the largest state in area and cultivated area the cropping intensity of 112 per cent indicates the extensive use of land. The land utilisation statistics of the state reveals that about 1.75 million hectares (3.96 per cent) land remains fallow (categorised as current and old fallow) and most of the area in the State being mono-cropped considerable area remains as seasonal fallow.

During the past two decades the population growth of 61.00 per cent has increased the scarcity of land. The increasing population resulting in the demand for more food and work for more hands naturally forces to step up production not only through extension of area under cultivation but also through raising the intensity of cropping. Increase in crop acreage is possible through two ways- (1) cultivation of additional land not previously used for raising of crops (2) raising two or more crops on the land already under cultivation. Availability of arable land is the limitation to the first while availability of resources limits the second possibility.

Since only about 10 per cent of the cultivated land is double cropped, the situation warrants for sincere efforts towards- (1) Cultivating more fallow land for raising crops, (2) Minimising the seasonal fallow by increasing the area under double cropping. With the announcement of the 'New 20 point Programme' of the Prime Minister

more efforts are being made in this direction. Proper utilisation of all available agricultural land, in order to increase the agricultural production has been given top priority in the agricultural programmes. Utmost utilisation of the 'Fallow Lands' for raising crops has been envisaged.

1.4 The present Study

1.4.1 Initiation - The Directorate of Economics and Statistics, Ministry of Agriculture, Govt.of India assigned Agro-Economic Research Centre, Jabalpur a study on 'Fallow Land in Madhya Pradesh'. The study aimed to analyse the factors responsible for the phenomenon i.e. fallow land.

1.4.2 Objectives

The objectives of the study were :

(1) To study the extent of fallow land in Madhya Pradesh its nature and spread

(2) To study the reasons behind non-utilisation of this land for raising crops

(3) To study the possibilities of utilising the fallow land for raising crops under the new technology

1.4.3 Sample

To study the problem in the State, two districts - Chhatarpur and Mandla - were selected from two different crop zones - rice zone and jowar-wheat zone where the proportion of 'Fallow Land' was quite high. The selection of the districts (one district from each selected crop zone) was also done on the basis of high proportion of fallow land to total cultivable land in the district. In each selected district two tahsils were selected and in each tahsil two villages were selected on the advice of the local officials. At every stage of sampling i.e. selection of crop zones, districts, tahsils and villages, high proportion of fallow land was the main consideration.

From each selected village a sample of 25 farmers was selected from the list of total farmers by random method. Thus a total of 50 farmers from each tahsil and 100 from each selected district formed the sample of the study. Thus the total sample comprised 200 farmers.

Data from the sample farmers was collected by survey method using a set of sehedules designed for the study. The reference year was 1981-82.

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Such land may be either fallow or covered with shrubs and jungles which are not put to any use. Land once cultivated but not cultivated for five years in succession is included in this category. These may be assessed or unassessed and may be in isolated blocks or within cultivated holdings.

3. Fallow Land

Fallow is that category of cultivated land which is kept vacant i.e. unsown for one cropping year or more. In the land use classification 'fallow land is divided under two heads 'current fallow' and 'Other fallow'

(a) Fallow land other than current fallow:

This includes all land which was taken up for cultivation but is temporarily out of cultivation for a period of not less than one year and not more than five years. The reasons for keeping such land fallow may be one of the following:

(i) Inability of farmer to cultivate for lack of means.
(ii) Inadequate water supply
(iii) Malarial climate
(iv) Silting of canals and rivers
(v) Unremunerative nature of farming

(b) Current fallow:

This class comprises area which is kept fallow during the current year. The term current fallow is used for the area which is not under crops at the time of reporting, but was sown in the previous years.

4. Net area sown: It represents the actual area under crops and orchards.

5. Cultivated Area: It is estimated by adding net area sown and fallow land.

6. Culturable Area:

Its estimation is done by adding the net area sown, fallow land and other uncultivated land excluding fallow land.

7. Seasonal Fallow:

It is that part of the net area sown which remains unsown during any crop season of the agricultural year. If that area remains unsown (vacant) during kharif season it is called 'kharif fallow' and similar unsown or vacant area of rabi is called 'rabi fallow'. Thus in the crop rotation the kharif fallow may be followed by some rabi crop and the rabi fallow may be preceded by some kharif crop.

2.3 Land Utilisation in India and Madhya Pradesh.

Madhya Pradesh shared 14.54 per cent of the total reported area in the country.

Out of 67.10 million hectares of forest area in the country (22.02 per cent of the total reported area) M.P. had 14.34 million hectares which was 32.38 per cent of the total area of the State and 21.37 per cent of the total forest area in the country.

The area not available for cultivation, which comprised of the land put to non-agricultural uses and the barren and uncultivable land- was 39.06 million hectares i.e. 12.81 per cent of the total area of the country. Madhya Pradesh shared 11.50 per cent of this area. Its proportion to the total area of the State was 10.13 per cent.

Excluding the two land utilisation categories i.e. forests and land not available for cultivation the remaining categories together form the total arable or cultivable land.

It is the availability of such arable or cultivable land which limits the expansion of agriculture in a state, and the size of area growth of agriculture in a given period depends on its earlier unexploited potentialities. The two important categories of land utilisation, included in the total arable land, which actually form the real potentiality of expansion of net area sown area -

(1) Culturable waste land and

(ii) Fallow land.

Table 2.1 Land Utilisation in India and Madhya Pradesh, 1977-78.

(Area in Million Hectares)

S.No.	Particulars	India		M.P.		% of M.P. to India
		Area	%	Area	%	
1.	Forests	67.11	22.02	14.34	32.38	21.37
2.	Land put to non-Agril. uses	17.64	5.78	2.20	4.95	12.45
3.	Barren and unculti-vable land	21.42	7.03	2.30	5.18	10.27
	Total land not available for cultivation	39.06	12.81	4.50	10.13	11.50
4.	Permanent pastures and other grazing land	12.37	4.05	2.87	6.47	23.20
5.	Land Under misc. tree crops and groves	3.97	1.30	0.15	0.33	3.65
6.	Cultivable waste land	16.92	5.55	1.91	4.31	11.30
	Total other Unculti-vable land Excluding Fallow Land	33.26	10.90	4.93	11.11	14.81
7.	Fallow Land other than Current Fallow	9.84	3.23	0.94	2.12	9.55
8.	Current Fallow	13.02	4.27	0.81	1.84	6.27
	Total Fallow Land	22.86	7.50	1.75	3.96	7.68
9.	Net Area Sown	142.61	46.77	18.80	42.42	13.18
Total Geographical Area		304.90		44.32		14.54

Total culturable waste land was 16.92 million hectares (5.55 per cent) in the country, of which Madhya Pradesh shared 1.91 million hectares i.e. 11.30 per cent. Its percentage to total area of the State was 4.31. Similarly, out of the total 22.86 million hectares (7.50 per cent) of fallow land in the country Madhya Pradesh shared 1.76 million hectares i.e. 7.58 per cent. Its proportion in the total area of the State was 3.96 per cent.

2.4 Changing Pattern of Land Utilisation in Madhya Pradesh

Forests

Forests occupy an important place in the economy of the state. Madhya Pradesh not only shares the highest percentage of forest area but also shares the biggest part in the income from forest resources in the country.

The proportion of forest area to the total geographical area of the State was 31.4 per cent in 1953-54 which increased to 32.6 per cent in 1975-76 showing an increase of 6.4 per cent over 1953-54 area under forests. It's linear growth rate was 0.69 per cent per annum.*

Land put to Non-Agricultural Uses

Total area under this category was 2.24 million hectares i.e. 5.1 per cent of the geographical area of the State in 1953-54. It decreased to 2.15 million hectares (4.8 per cent) in 1975-76 indicating a shift of 90 thousand hectares land from this category to other land use pattern. This decrease was 3.7 per cent of the 1953-54 area. It's linear growth rate was 1.29 per cent per annum.

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*'Agricultural Development in Madhya Pradesh (1950-51 to 1975-76) S.K.Dubey, K.G.Sharma and G.D.Agrawal, Agro-Economic Research Centre for Madhya Pradesh, Jabalpur, (Mimeographed) 1979.

Land Not Available for Cultivation

Land not available for cultivation is barren and uncultrable land like mountains desert etc. From agricultural point of view it is of little importance. This category constituted 5.6 per cent of total area in 1953-54 which decreased to 5.1 per cent in 1975-76. It's linear growth rate was - 1.21.

Table 2.2 Land Utilisation in Madhya Pradesh 1953-54 and 1975-76

(Area in Million Hectares)

S.No.	Category	1953-54 Area	1953-54 %	1975-76 Area	1975-76 %	Percentage of increase (+) or decrease (-) in 1975-76 as compared with 1953-54	Linear Growth Rate 1950-51 to 1975-76
1.	Forests	13.62	31.4	14.48	32.6	+ 6.4	0.69
2.	Land put to non-Agricultural uses	2.24	5.1	2.15	4.8	- 3.7	1.29
3.	Barren and uncultivated land	2.43	5.6	2.28	5.1	- 6.3	- 1.21
	Total land not available for cultivation	4.67	10.7	4.43	9.9	- 0.8	—
4.	Permanent Pastures and other grazing land	2.49	5.7	3.08	6.9	+23.7	6.04
5.	Misc.tree Crops and graves not included in net area sown	0.42	1.0	0.12	0.3	-71.6	- 7.27
6.	Culturable Waste	4.38	10.1	2.02	4.5	-53.8	- 3.09
	Total other uncultivable Land excluded Fallow Land	7.29	16.8	5.22	11.7	- 5.1	—
7.	Current Fallow	1.07	2.5	0.88	2.0	-17.3	- 0.47
8.	Other Fallow Land	1.54	3.6	0.75	1.7	-51.2	- 2.94
	Total Fallow Land	2.61	6.1	1.63	3.7	- 2.4	—
9.	Net Area Sown	15.19	35.0	18.72	42.1	+23.22	1.26
	TOTAL	43.38	100.CC	44.48	100.00	+2.53	—

Permanent Pastures and Other Grazing Land

These include all land embarked for grazing whether they are permanent pastures and meadows or not. The area under this category was 2.49 million hectares (5.7 per cent) in 1953-54 which increased to 3.08 million hectares (6.9 per cent) in 1975-76. The increase was 23.7 per cent and it's linear growth rate was 6.04 per cent per annum. Though secondary in importance from agricultural point of view still the existence of pastures and grazing land is essential for maintenance of cattle and livestock.

Land Under Miscellaneous Tree Crops and Groves

These comprise all cultivable land which is not included in the net area sown but is put to some other agricultural uses. It constituted 1.0 per cent of total area in 1953-54 and showing a decreasing trend came down to 0.3 per cent in 1975-76. Its linear growth rate was negative (-7.27 per cent per annum).

Culturable Waste Land

In 1953-54, there were 4.38 million hectares classified as culturable waste. It formed 10.1 per cent of total area of the State. In 1975-76, culturable waste land was 2.02 million hectares (4.5 per cent). This striking change i.e. decrease of 53.8 per cent in the area recorded in 1975-76 may be attributed mainly to the increase in net cropped area which increased from 15.19 million hectares to 18.72 million hectares. This increase was 23.2 per cent.

Net Area Sown

Proportion of net area sown increased from 35.0 per cent in 1953-54 to 42.1 per cent in 1975-76. Including the current fallows with net area sown, the cultivated area

formed 37.5 per cent of geographical area in 1953-54 and 44.1 per cent in 1975-76. Net area sown increased at a linear growth rate of 1.26 per cent per annum.

Out of the nine land utilisation categories, only three i.e forest, permanent pastures and other grazing land and net area sown increased by 6.4, 23.7 and 23.2 per cent respectively. Linear growth rates of these categories during the period 1953-54 to 1975-76 were 0.69, 6.04 and 1.26 per cent per annum respectively. All the other categories of land utilisation showed decrease and the decrease in culturable waste (53.8 per cent), other fallow (51.2 per cent) current fallow land (17.3 per cent) and tree crops and groves (71.6 per cent) were considerable.

2.4 Possibilities of Expansion in Cultivated Area

An U.N. Agency ECAFE had calculated that in the under-developed countries of Asia and Far East, "nearly three fourths of the expansion (of agricultural output during 1950s) was brought about by an increase in area*, but in the present situation" the scope for expanding the cultivated area is now very limited+."

Looking to the land utilisation statistics of India (discussed above), it may be noted that in India 39.78 million hectares (which includes culturable waste land and total fallow land) i.e. 13.05 per cent of the total reporting area may be brought under cultivation if they are really cultivable. Some of this area might not be under cultivation on account of poor

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* U.N. Economic Bulletin for Asia and Far East. 1965.

+ U.N. Economic Survey of Asia and Far East 1964 Both the references quoted from Gunnar Myrdal's - Asian Drama Vol II p. 1261.

fertility and may require its reclamation at substantial cost. Again, looking to the increasing population, urbanization and expanding land communication the possibility of extending cultivation on more cultivable area is quite limited in our country. Besides, so long as considerable areas continue to depend on rainfall and afford only one crop a year, some areas are bound to be left fallow for maintaining crop rotations because the fertility is low.

In Madhya Pradesh the increase in gross cropped area had been 27.03 per cent in 1975-76 over 1953-54 (Table 2.3) Its average growth rate had been 1.32 per cent per annum. The said increase in gross cropped area may be ascribed to two main possible sources : (i) cultivation of land not previously used for raising crops and (ii) raising more than one crop on lands already under cultivation.

The net area sown (during the same period i.e. 1953-54 to 1975-76 has increased from 15,192.21 thousand hectares to 18,720.00 thousand hectare i.e. by 23.22 per cent. Its linear growth rate had been 1.26 per cent per annum. Although the net area sown has increased by as much as 23.22 per cent the gross cropped area has also increased by about the same percentage (27.03) indicating that during all these years the intensity (or area sown more than once) has not proportionately increased. It has increased from 10.68 per cent to 14.10 per cent a more increase of 3.42 per cent. Its average annual growth rate was 1.71 per cent per annum.* (Table 2.3)

In the present situation the possibilities of expansion in cultivated area in Madhya Pradesh have minimised as the

*'Agricultural Development in Madhya Pradesh '1950-51 to 1975-76 Part I, Agro-Economic Research Centre for M.P. Jabalpur (Mimeographed) 0.94

percentage of culturable waste and fallow land together is only 8.27 per cent of total reporting area (Table 2.1), which limits the scope of further expansion in net area sown. Now, double cropping may appear to hold greater possibilities for an increase in total cropped area, but the extent of double cropping depends upon the level of irrigation.

Table 2.3 Increase in Net Area Sown, Double cropped and Gross Cropped Area of Madhya Pradesh (1953-54 to 1975-76)

(Area in thousand Hectares)

Cropped Area	1953-54		1975-76		Percentage increase or decrease	Linear Growth Rate
	Area	%	Area	%		
Net area sown	15192.21	35.00+	18720.00	42.10+	23.22	1.26
Double cropped area (i.e.Area sown more than once)	1622.20	10.68*	2640.00	14.10*	62.74	1.71
Gross Cropped Area	16814.41	-	21360.00	-	27.03	1.32

More than 85 per cent of the net area sown in the State is still unirrigated it continues to depend on rainfall therefore, major part of it grows only one crop during an agricultural year. Thus, there are two possibilities of increasing agricultural production in this State.

(1) By bringing under cultivation the additional 8.27 per cent of the arable land under plough.

(2) Increasing irrigation potential. In this study we are more concerned about the former solution of the problem.

+ Percentages to total reported Area (Geographical Area) of Madhya Pradesh

* Percentages to net area sown.

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CHAPTER III

FALLOW LAND IN MADHYA PRADESH

Looking to the importance of 'land' as an essential factor of production, various measures have been adopted by the Government to protect and increase the available area of agricultural land. Upto the end of Fifth Five year Plan about 20 per cent of such land which required land improvement and other soil conservation measures was brought under soil and water conservation programme in this State. However, the use of land resource is still extensive and the cropping intensity is low. Mono-cropping is quite common and sufficient area is kept under fallow- distinguished as old, current and seasonal fallows.

3.1 State wise Position of Fallow Land in India

On the basis of the percentage of area under fallow to total reporting area of the State, Bihar stood first (14.30 per cent), Andhra Pradesh second (13.70 per cent), Tamil Nadu third (12.99 per cent), Rajasthan fourth (12.22 per cent) and Karnataka fifth (8.85 per cent). These five States, together, shared 60.36 per cent of total fallow land in the country. Madhya Pradesh stood eleventh in this respect having 3.96 per cent area under fallow.

With regard to the absolute acreage of fallow land Rajasthan stood first (4,184 thousand hectares) followed by Andhra Pradesh (3,759 thousand hectares), Bihar(2,479 thousand hectares) and Madhya Pradesh which stood fourth (1,756 thousand hectares) sharing 7.68 per cent of the total fallow land. Total fallow land in these four States was 12,178 thousand hectares which formed 53.27 per cent of total fallow land in the country.

3.2 Situation in Madhya Pradesh

The proportion of fallow land in Madhya Pradesh is not very high in relative terms, though absolute area of fallow land in the state is considerable i.e. 1,756 thousand hectares (i.e. 7.68 per cent of total fallow land in the country).

The proportion of fallow land in the State decreased from 6.0 per cent (in 1953-54) to 3.7 per cent (in 1975-76) which included 2.0 per cent current fallow and 1.7 per cent other fallow. Growth rate of both these categories was negative i.e. -0.47 per cent per annum for current fallow and -2.94 per cent per annum for other fallow land* (Table 2.2)

Table 3.1 Statewise Area and Percentage of Fallow Land in India (1977-78).

(Area in thousand hectares)

S.No.	State	Reporting Area for Land Utilisation	Total Area of Fallow Land	Percentage of Fallow Area to total Reporting Area	Percentage of Fallow Area in the State to total Fallow Area
1.	Bihar	17330	2479	14.30	10.85
2.	Andhra Pradesh	27440	3759	13.70	16.44
3.	Tamil Nadu	12999	1689	12.99	7.39
4.	Rajasthan	34227	4184	12.22	18.30
5.	Karnataka	19064	1687	8.85	7.38
6.	Maharashtra	30758	1655	5.38	7.24
7.	Uttar Pradesh	29795	1498	5.03	6.55
8.	Orissa	15540	767	4.94	3.35
9.	Gujrat	18810	917	4.87	4.01
10.	West Bengal	8856	362	4.08	1.58
11.	Madhya Pradesh	44317	1756	3.96	7.68
12.	Haryana	4404	119	2.70	0.52
13.	Punjab	5033	62	1.23	0.27
14.	Other States	36322	1924	5.29	8.44
All India		304895	22858	7.49	100.00

*'Agricultural Development in Madhya Pradesh (1950-51 to 1975-76) Agro-Economic Research Centre for Madhya Pradesh Jabalpur (Mimeographed)

3.3 Crop Zone Wise Distribution

Table 3.2 gives a comparative picture of distribution of fallow land in different crop zones of Madhya Pradesh. The absolute area of fallow land was highest in rice zone (924 thousand hectares) sharing 48.13 per cent of total fallow area in the State. Jowar-Wheat Zone stood second with 432 thousand hectares of fallow area, sharing 22.53 per cent. The proportion of fallow area to the total geographical area (reported area) was highest in Rice-Wheat crop Zone (7.85 per cent) followed by Jowar-Wheat zone (5.40 per cent) and then Rice zone having 5.09 per cent area under fallow.

Table 3.2 Area and Percentage of Fallow Land in Different Crop Zones of Madhya Pradesh (Three years Average 1977-78 to 1979-80)

(Area in thousand Hectares)

Crop Zone	Total Geographical Area (Area Reported)	Fallow Land					
		Current Fallow		Other (old) Fallow		Total Fallow	
		Area	% total Geographical Area	Area	% to total Geographical Area	Area	% to total Geographical Area
Rice Zone	18152.6	448.90 (48.83)	2.47	475.4 (47.49)	2.62	924.30 (48.13)	5.09
Rice-Wheat Zone	3957.8	148.40 (16.14)	3.75	162.60 (16.24)	4.10	311.00 (16.19)	7.85
Wheat Zone	5760.9	55.50 (6.04)	0.96	62.70 (6.26)	1.09	118.20 (6.15)	2.05
Jowar-Wheat Zone	8014.3	203.80 (22.17)	2.54	228.90 (22.87)	2.86	432.70 (22.53)	5.40
Cotton-Jowar Zone	8516.8	62.70 (6.82)	0.73	71.40 (7.13)	0.84	134.10 (6.98)	1.57
All M.P.	44402.4	919.30	2.07	1001.00	2.25	1920.30	4.32

Note : Figures in parentheses indicate percentages to total of the column.

3.4 District-wise Position

Districtwise distribution of fallow land and its percentage to total cultivated area in the State-based on three years average data of 1977-78 to 1979-80 is given in Table 3.3. From the table it is evident that highest proportion of fallow land was in Mandla district (26.32 per cent) and lowest in Indore(1.29 per cent). Eighteen districts had higher proportion of fallow land than the State proportion of 9.43 per cent. These districts shared 72.76 per cent of total fallow area, while the first five districts i.e. Mandla, Shahdol, Chhatarpur, Sidhi and Panna showing highest proportion of fallow land shared 25.93 per cent of total fallow land in the State.

The highest acreage of 'old fallow' was in Shahdol district 77.8 thousand hectares i.e.13.18 per cent of total cultivated area in the district followed by Mandla 77.1 thousand hectares which was 13.92 per cent. Other important districts following Shahdol and Mandla, were Surguja, Bastar and Chhatarpur. With regard to 'currentfallow' Mandla stood first with 68.7 thousand hectares (12.40 per cent of total cultivated land) followed by Shahdol, Surguja, Chhindwara and Chhatarpur. Lowest acreage of fallow land was in Bhopal district (2.4 thousand hectares which included 1.1 thousand hectares current fallow and 1.3 thousand hectares 'old fallow') though its percentage to total cultivated area (1.57 per cent) was higher than Indore (1.29 per cent).

3.5 Mono-Cropping and Seasonal Fallow

Vast area of the country comes in semi-arid tropical region (SAT) which spreads over nearly 210 districts, covering the states of Tamil Nadu, Karnataka, Andhra Pradesh, Maharashtra,

Table 3.3 Districtwise, Area and Percentage of Fallow Land in Madhya Pradesh
(3 years Average 1977-78 to 1979-80)

(Area in thousand Hectares)

S. No.	District	Total Cultivated Area (Net Area Sown plus Fallow)	Fallow Land			Percentage of Fallow Land to total cultivated Area
			Current Fallow	Old Fallow	Total Fallow	
1.	Mandla	553.9	68.7	77.1	145.8	26.32
2.	Shahdol	590.4	66.3	77.8	144.1	24.41
3.	Chhatarpur	424.2	41.1	51.1	92.2	21.74
4.	Sidhi	405.9	35.5	38.3	73.8	18.18
5.	Panna	250.1	17.7	25.4	43.1	17.24
6.	Surguja	665.8	54.9	56.7	111.6	16.77
7.	Shivpuri	411.5	30.2	37.1	67.3	16.35
8.	Seoni	436.6	31.4	37.4	68.8	15.76
9.	Jabalpur	544.4	39.4	45.3	84.7	15.56
10.	Betul	462.1	35.5	34.8	70.3	15.21
11.	Chhindwara	560.4	41.7	39.8	81.5	14.54
12.	Raigarh	593.8	40.9	37.9	78.8	13.27
13.	Rewa	413.3	24.4	28.6	53.0	12.82
14.	Tikamgarh	250.1	13.6	18.0	31.6	12.64
15.	Satna	384.7	35.5	25.9	61.4	15.96
16.	Balaghat	306.2	14.4	18.3	32.7	10.68
17.	Bastar	871.2	50.8	51.4	102.2	11.73
18.	Rajnandgaon	548.8	29.7	27.7	57.4	10.46
19.	Damoh	299.7	10.9	13.1	24.0	8.01
20.	Bilaspur	884.5	34.0	33.5	67.5	7.63
21.	Morena	406.6	15.2	15.7	30.9	7.60
22.	Datia	136.4	3.7	6.1	9.8	7.18
23.	Raipur	991.7	33.8	35.9	69.7	7.03

Table 3.3 Continued.....

S. No.	District	Total Cultivated Area	Fallow Land			Percentage of Fallow land to total cultivated Area
			Current Fallow	Old fallow	Total Fallow	
24.	Durg	595.7	19.9	20.8	40.7	6.83
25.	Hoshangabad	469.8	13.8	17.2	31.0	6.60
26.	Jhabua	361.3	11.7	11.7	23.4	6.48
27.	Narsinghpur	290.7	8.3	10.3	18.6	6.40
28.	Gwalior	264.6	7.3	8.4	15.7	5.93
29.	Sagar	532.0	11.4	9.3	20.7	3.89
30.	Khandwa	458.0	9.2	11.2	20.4	4.46
31.	Guna	590.8	11.5	12.3	23.8	4.03
32.	Dhar	507.7	7.7	8.3	16.0	3.15
33.	Rajgarh	406.5	5.3	7.1	12.4	3.05
34.	Ratlam	309.1	4.5	4.4	8.9	2.88
35.	Bhind	343.5	4.0	5.6	9.6	2.79
36.	Khargone	635.8	7.7	9.6	17.3	2.72
37.	Ujjain	465.1	4.4	4.8	9.2	1.98
38.	Shajapur	419.5	3.6	4.8	8.4	2.00
39.	Dewas	354.6	2.7	3.9	6.6	1.86
40.	Raisen	410.3	3.5	4.1	7.6	1.85
41.	Vidisha	510.9	4.1	4.7	8.8	1.72
42.	Mandsaur	523.3	4.5	3.9	8.4	1.61
43.	Bhopal	153.2	1.1	1.3	2.4	1.57
44.	Sehore	352.2	2.4	2.7	5.1	1.44
45.	Indore	260.0	1.4	1.7	3.1	1.29
ALL M.P.		20406.3	904.1	1020.4	1924.5	9.43

Madhya Pradesh, Gujarat, Rajasthan, Uttar Pradesh and Haryana.

The physical, economic, social and technological characteristics within this region differ widely. At the one extreme are the tracts which receive reasonable high rainfall and at the other extreme are the areas receiving very low rainfall. "In 21 districts of SAT region in India, over two third cropped area has no irrigation. Out of 143 million hectares net sown area mean annual rainfall is over 1,125 m.m. in 32 million hectares and below 350 m.m. in 19 million hectares*. "It is in between these two extremes are the tracts which are also very poor in irrigation facilities and are predominantly rainfed.

An important feature of the traditional farming in rainfed areas of SAT region in India and elsewhere is mono-cropping. Under this system the land is generally put under crops in one crop season and kept vacant in the remaining crop seasons of the year. Thus seasonal fallows is an associated feature of mono-cropping. Table 3.4 given a clear picture of the proportion of net area cropped ones, twice or more than twice in different states of the country.

Quoting the results of village level studies, Jodha has mentioned that 'In the two Sholapur villages that have a high proportion of deep Vertisols and a bimodal pattern of monsoon rains, 61 and 68 per cent of the net cropped area was kept fallow during the rainy season and planted in the rabi, or post rainy season. This practice, known as kharif

*"Tandon, H.L.S. Research and Development of Fertilizer use in Dryland Agriculture. Fertilizer News, Vol.26 No.6 June 1981 Page 25.

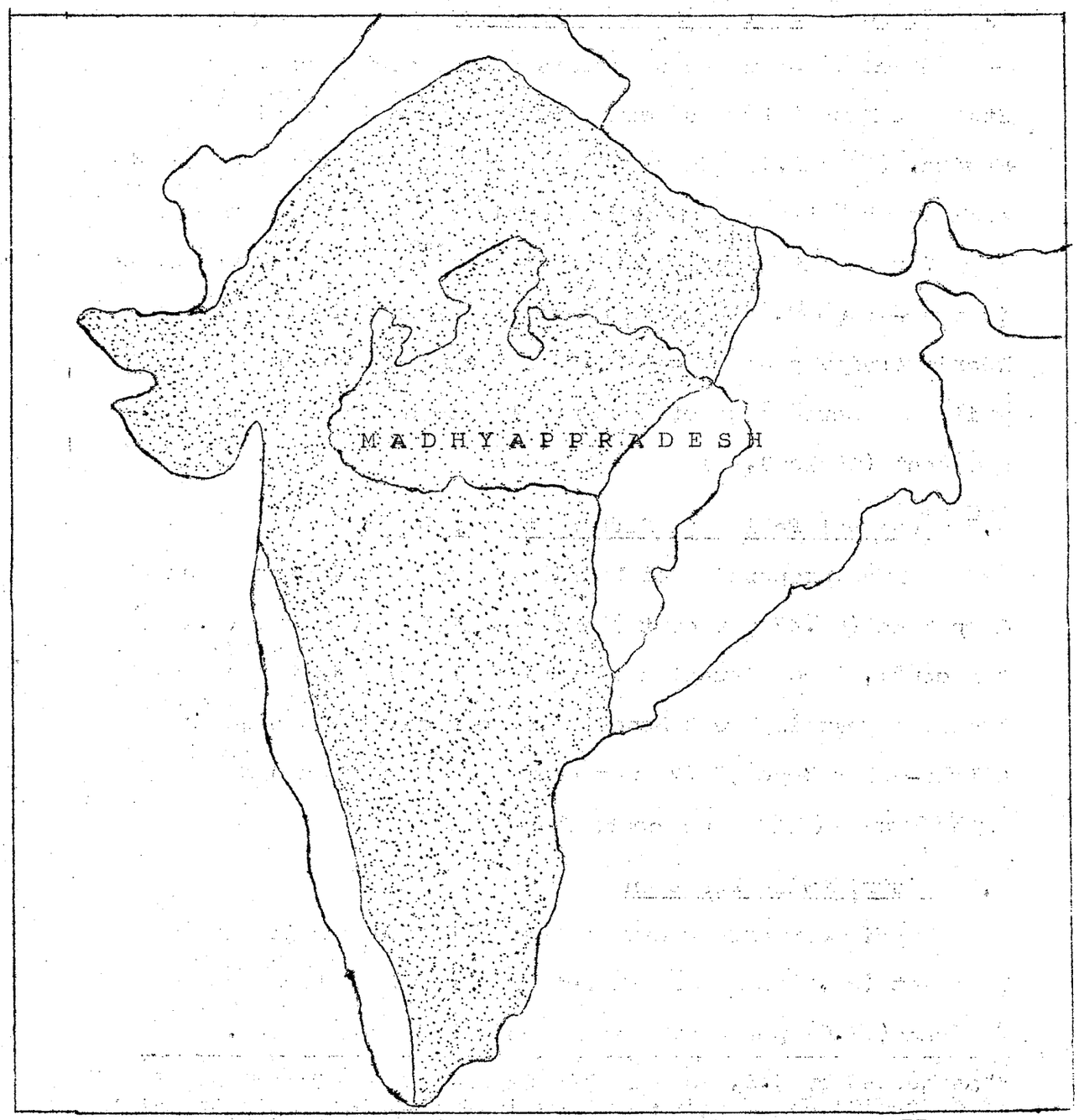
Table 3.4 Percentage Distribution of Net Area Cropped Once, Twice and Mone than Twice in Different States.

States.	Area Cropped Once (%)	Area Cropped Twice (%)	Area Cropped More than Twice (%)
Andhra Pradesh	84.0	15.6	0.4
Assam	65.6	34.2	0.2
Bihar	63.4	35.1	1.5
Gujrat	90.9	8.8	0.3
Haryana	45.8	54.1	0.1
Himachal Pradesh	33.2	66.8	0.0
Jammu and Kashmir	66.1	33.7	0.2
Karnatak	94.0	5.7	0.3
Kerala	81.0	17.3	1.7
Madhya Pradesh	85.4	14.5	0.1
Maharashtra	91.2	8.7	0.1
Orissa	86.2	13.4	0.4
Punjab	22.6	76.3	1.1
Rajasthan	86.1	13.9	0.0
Tamil Nadu	78.3	20.7	1.0
Uttar Pradesh	56.4	43.2	0.4
West Bengal	68.2	29.1	2.7
All States/Union Territories	77.4	22.1	0.5

SOURCE : 'Draft All India Report on Input Survey 1976-77 (Vol I)'; Department of Agriculture and Cooperation (Agricultural Census Division) Ministry of Agriculture New Delhi (Mimeographed).Table 6.2 p. 45.

Map 3.1

SEMI-ARID TROPICAL REGION
IN
INDIA



SOURCE :- 'Economics Program' Annual Report 1976-77.
ICRISA Hyderabad, India.

(rainy season) fallowing and rabi (postrainy season) cropping, is wide spread in the deep vertisol region of SAT India. Ryan had estimated that nearly 18 million hectares or more than 24 per cent of the net sown area in SAT areas of India, is fallowed during the rainy season to be planted during the post rainy season*."

3.6 Seasonal Fallow in Madhya Pradesh

Barring a few districts of the south east, entire State of Madhya Pradesh comes under Semi Arid Tropical Region. (Map 3.1) Nearly 87 per cent of the total cultivated area in the State is dependent entirely on monsoon and therefore about 85 per cent of the net area sown in the state is mono-cropped. The percentage of seasonal fallow during kharif (rainy season) was 28.15 per cent of net area sown while the percentage of seasonal fallow during rabi was 57.46 per cent (Table 3.4)

3.7 Seasonal Fallow in Different Crop Zones

The proportion of kharif fallow was highest in Wheat Crop Zone (69.47 per cent) and lowest in Rice Zone (8.15 per cent). The situation of rabi fallow was just reverse. It was lowest in Wheat Zone (26.66 per cent) and high in Cotton-Jowar Zone (72.20 per cent of the net area sown and rice zone (72.20 per cent) Table 3.4.

3.8 Districtwise Position

Highest proportion of kharif fallow was in Raisen District (82.00 per cent of net area sown) followed by Vidisha (78.61 per cent) and Sagar (72.44 per cent).

*"As quoted by N.S.Jodha in his paper- 'Some Dimensions of of Traditional Farming Systems in Semi-Arid Tropical India' Presented in the International workshop on Socioeconomic constraint to Development of Semi-Arid Tropical Agriculture. ICRISAT 1979.

All these districts beloged to wheat crop zone of the State. Twenty one districts of the State had higher percentage of kharif fallow than the state percentage of 28.15 per cent (Table 3.5).

Table 3.4 Area and percentage of Seasonal Fallow in different crop Zones of Madhya Pradesh (Three years Average 1977-78 to 1979-80)

(Area in thousand Hectares)

Crop Zone	Net Area Sown	Seasonal Fallow			
		Kharif		Rabi	
		Area	% of Net Area Sown	Area	% to Net Area Sown
Rice Zone	6081.80 (32.55)	495.60 (9.42)	8.15	4391.40 (40.91)	72.20
Rice-Wheat Zone	1718.80 (9.20)	790.30 (15.03)	45.97	637.00 (5.93)	37.06
Wheat Zone	2896.80 (15.51	2012.50 (38.27)	69.47	772.20 (7.19)	26.66
Jowar-Wheat Zone	3417.40 (18.29)	1421.40 (27.03)	41.59	1631.70 (15.20)	47.76
Cotton-Jowar Zone	4566.80 (24.44)	539.30 (10.25)	11.80	3302.60 (30.76)	72.31
All M.P.	18681.60 (100.00	5259.10 (100.00)	28.15	10734.90 (100.00)	57.46

NOTE:- Figures in Parentheses indicated percentages to total.

The percentage of rabi fallow was 57.46 per cent in the State and 21 districts had higher percentage. Highest percentage of rabi fallow was in Bastar (94.89 per cent) followed by Raigarh (94 per cent) and Khargone (92.68 per cent). The first two belonged to the rice zone and the third to cotton-jowar zone. (Table 3.6)

Table 3.5 Districtwise, Percentage of Seasonal Fallow Kharif to Net Area Sown

District	%	Rank	Districts	%	Rank
Raisen	82.00	1	Tikamgarh	20.87	24
Vidisha	78.61	2	Rajnandgaon	19.68	25
Sagar	72.44	3	Dewas	18.59	26
Bhopal	72.02	4	Dhar	17.78	27
Datia	69.41	5	Betul	17.18	28
Bhind	66.82	6	Mandla	16.47	29
Hoshangabad	65.52	7	Shajapur	15.83	30
Narsinghpur	64.39	8	Chhindwara	15.20	31
Gwalior	61.63	9	Sidhi	13.52	32
Damoh	60.97	10	Ratlam	12.39	33
Morena	60.21	11	Rajgarh	12.28	34
Panna	53.82	12	Shahdol	9.72	35
Satna	52.20	13	Bilaspur	8.49	36
Sehore	52.07	14	Mandsaur	4.99	37
Guna	51.00	15	Balaghat	4.59	38
Jabalpur	48.54	16	Raipur	3.37	39
Chhatarpur	43.04	17	Khandwa	2.63	40
Rewa	39.83	18	Bastar	0.87	41
Seoni	38.77	19	Khargone	0.78	42
Indore	34.18	20	Jhabua	0.24	43
Shivpuri	32.86	21	Raigarh	-	44,45
Ujjain	23.23	22	Surguja	-	
Durg	21.64	23	ALL M.P.	28.15	

NOTE :- Percentages calculated on three years average data i.e. for 1977-78 to 1979-80.

Table 3.6 Districtwise Percentage of Seasonal Fallow Rabi to Net Area Sown

District	%	Rank	District	%	Rank
Bastar	94.89	1	Tikamgarh	53.91	24
Raigarh	94.00	2	Shivpuri	53.40	25
Khargone	92.68	3	Durg	44.74	26
Khandwa	90.90	4	Guna	44.60	27
Surguja	87.89	5	Chhatarpur	43.31	28
Jhabua	87.01	6	Sehore	41.87	29
Shahdol	77.12	7	Rewa	34.22	30
Rajgarh	76.94	8	Panna	33.91	31
Chhindwara	74.02	9	Jabalpur	33.61	32
Shajapur	71.86	10	Hoshangabad	31.84	33
Dewas	70.83	11	Narsinghpur	30.94	34
Betul	70.44	12	Gwalior	29.69	35
Bilaspur	70.38	13	Damoh	29.20	36
Dhar	67.43	14	Indore	28.42	37
Raipur	66.45	15	Morena	27.76	38
Balaghat	65.38	16	Satna	27.44	39
Ratlam	65.29	17	Bhind	27.16	40
Mandla	64.29	18	Datia	26.88	41
Ujjain	63.63	19	Bhopal	26.66	42
Mandsaur	58.61	20	Sagar	23.21	43
Rajnandgaon	58.20	21	Vidisha	18.60	44
Sidhi	55.36	22	Raisen	16.66	45
Seoni	54.65	23	ALL M.P.	57.46	-

NOTE:- Percentagescalculated on three years average data i.e. for 1977-78 to 1979-80.

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CHAPTER IV

SELECTED AREA AND SAMPLE

4.1 Selected Area

The focus of this chapter is on the basic characteristics of the areas selected for the study viz. the districts, tahsils and villages.

As explained earlier, two districts having highest percentage of fallow area to their cultivated area were selected from two different crop zones of the State. One of the selected district was Chhatarpur from Jowar-Wheat crop zone and the other Mandla from the rice zone of the State. Thus the selected districts for the study were Chhatarpur and Mandla.

Table 4.1 District Having Highest Proportion of Fallow land in each Crop Zone of Madhya Pradesh land

Crop Zones of M.P.	District having highest proportion of fallow land in each crop zone		Selected Districts
	Name of Districts	Percent of Fallow Area.	
Rice Zone	Mandla	26.32	Mandla
Rice-Wheat zone	Panna	17.24	-
Wheat zone	Hoshangabad	6.60	-
Jowar-Wheat zone	Chhatarpur	21.74	Chhatarpur
Cotton-Jowar zone	Jhabua	6.48	-

4.2 Chhatarpur District

4.2.1 Situation

Chhatarpur district lies between 24°0 and 25°5' north latitude and 79°0 and 80.5' east longitude. It is situated in the northern part of the State and comes in Sagar division. The boundary of the district marches with

the State of Uttar Pradesh in the north and the other three sides are surrounded by Panna district in east, Damoh and Sagar in south and Tikamgarh in the west. There are three tehsils in the district namely Chhatarpur, Laundi, and Bijawar.

4.2.2 Area and Population

The area of the district is 8630.7 sq. kms.which is 1.95 per cent of the State area. According to the 1981 Census the total population of the district was 8,86,660 and the rural population formed 84.43 per cent of it. The density of population was 103 per sq. km.

4.2.3 Agricultural Workers

According to 1981 Census 34.97 per cent of the total population in the district was engaged in some economic activity. Of the total workers 78.13 per cent were engaged in agriculture alone. The percentage of cultivators to total agricultural workers was 74.14.

4.2.4 Rainfall and Climate

Average rainfall of the district is 995.83 m.m. and the coefficient of variation of rainfall is 24.70 per cent. Most of the rain is received during July and August. The climate is generally of dry type and is subject to extremes.

4.2.5 Soils

There are mainly four types of Soils in the district viz. Mar, Kabar, Padua and Rankar. Mar is loamy black soil, retains moisture and is very fertile. Kabar is like Mar, lighter in colour and fertility. Padua is a lighter type

lacking in organic matter and Rankar is reddish coloured, very light, consisting of gravel and is least fertile of the lot. This constitutes nearly sixty per cent of the total area and is responsible for the backwardness in cultivation. The soil fertility index* of the district was 48.0 and the district ranked 34th in the State. The nutrient status (N.PK)+ of the soils in the district was : N- low, P- low and K - high.

4.2.6 Land Utilization

The total geographical area of the district is 863068 hectares out of which net area sown was 330982 hects. i.e. 38.34 per cent in 1981-82. Area sown more than once was 46,627 hectares which was 14.08 per cent of the net area sown. The percentage of cultivable land to total geographical area of the district was 72.67. Seventy two per cent of this cultivable land is cultivated and the rest is either cultivable waste or under some other agricultural use. Again the net area sown forms 78.26 per cent of the total cultivated area. The remaining being either old or current fallow. (Table 4.2)

4.2.7 Extent and Source of Irrigation

In the district privately owned wells are the main source of irrigation followed by tanks and Canals. There were 37,130 wells in use for irrigation and 65,374 hectares were irrigated, thereby the average was 1.76 hectares per well. The percentage of gross irrigated area to gross cropped area was 21.14 per cent. Area irrigated by different sources in the district in 1981-82 is given in table 4.3.

* 'Rating of Soils in India' by K.B.Shome and S.P.Ray Chaudhari.

+ 'Nutrient Status of Soils in Madhya Pradesh' Department of Soil Science J.N.Agril.University Jabalpur(Mimeographed)

Table 4.2 Land Utilisation of Chhatarpur District of Madhya Pradesh (1981-82)

S.No.	Particulars	Area (Hect.)	% of total
1.	Area under Forest	86368	10.01
2.	Land put to Non-Agril. uses	45665	5.29
3.	Barren and unculturable land	103846	12.03
4.	Permanent pastures and other grarging land	91132	10.56
5.	Area under Mise.Trees crops and groves not included in Net area sown	234	0.03
6.	Culturable Waste land	108272	12.56
7.	Area under Current fallow	33026	3.82
8.	Area under other fallow	63543	7.36
9.	Net Area sown	330982	38.34
Total Geographical Area		863068	100.00
	Double cropped Area	46627	-
	Gross Cropped Arean	377609	-
	Percentage of Double Cropped area to Net area sown.	-	14.08

Table 4.3 Area Irrigated by different Sources in District Chhatarpur (1981-82)

Source	Area (Hect)	Percentage to total irri.Area
Canal	9727	12.18
Tanks	2419	3.03
Wells	65374	81.89
Tube-wells	10	0.01
Other	2304	2.89
Total	79834	100.00

Among different sources, wells were major source of irrigation sharing 81.89 per cent followed by canals which served 12.18 per cent of the total irrigated area.

4.2.8 Cropping Pattern

The district of Chhatarpur comes in Jowar-Wheat Zone of the state and these two crops occupy 34.77 per cent of the total cropped area of the district. Barley, Paddy, Urad, and Tur are other crops of importance occupying 7.09, 5.16, 4.55 and 2.44 per cent of the total cropped area respectively.

Among rabi crops wheat, gram and masoor occupied 25.69, 14.18 and 1.10 per cent respectively. (Table 4.4).

Of the different crops wheat, barley, gram, other pulses fruits and vegetables are the main irrigated crops which together shared 97.21 per cent of the total irrigated area. (Table 4.5)

Table 4.5 Cropwise Irrigated Area in Chhatarpur District (1979-80)

Crops	Irri-gated Area	% of Irri-gated area of the crop to total irrigated Area	Total Area of the crop (Hect.)	Percentage of irrigated Area of the crop to total area of the crop.
Rice	170	0.25	19700	0.86
Wheat	33030	48.36	82000	40.28
Barley	24370	35.68	33100	73.62
Gram	5650	8.27	47400	11.92
Other pulses	2350	3.44	37300	6.30
Sugercane	380	0.56	409	92.91
Condiments & Spices	400	0.59	557	71.81
Fruits & Vegetabls	1000	1.46	2225	44.94
Oil seeds	600	0.88	33800	1.77
Tobacco	57	0.08	60	95.00
Other crops	293	0.43	25749	1.14
Gross Irri.Area	68300	100.00	364300	18.74

Table 4.4 Cropping Pattern in Chhatarpur District (1981-82)

S.No.	Crops	Area (Hect.)	% to total
I	Cereals		
1.	Rice	19490	5.16
2.	Wheat	96995	25.69
3.	Jowar	34276	9.08
4.	Bajra	71	0.02
5.	Barley	26783	7.09
6.	Maize	566	0.15
7.	Ragi	193	0.05
8.	Other Cereals & Millets	34388	9.11
	Total Cereals	212762	56.35
II	Pulses		
1.	Gram	53522	14.18
2.	Arhar	9225	2.44
3.	Moong & Moth	4351	1.15
4.	Urad	17143	4.55
5.	Masoor(Lentil)	4157	1.10
6.	Other Pulses	411	0.10
	Total Pulses	88809	23.52
III	Oil seeds		
1.	Linseed	5405	1.43
2.	Sesamum	17940	4.75
3.	Groundnut	241	0.06
4.	Rape & Mustard	4241	1.12
5.	Other Oil seed	3770	1.00
	Total Oil seed	31570	8.36
IV.	Total Sugarcane	434	0.11
V	Total Fibers	787	0.21
VI	Total Drugs & Narcotics	342	0.09
VII	Condiments & Spices		
1.	Chillies	323	0.09
2.	Coriender	349	0.09
3.	Others	54	0.01
	Total Condiments & Spices	726	0.19
VIII	Fruits & Vegetables		
1.	Fruits	133	0.03
2.	Vegetables	2325	0.62
	Total Fruits & Vegetables	2458	0.65
IX	Total Fodder crops	39717	10.52
X	Total Mise. Crops	4	-
	Total All Crops	377609	100.00

The percentage of double cropped area to net area sown was 14.08. The proportion of cash crops in the cropping pattern of the district was only 10.49 per cent.

4.3 Selected Tahsils in Chhatarpur District

Out of the three tahsils/Chhatarpur district namely Chhatarpur, Laundi and Bijawar, two tahsils viz. Chhatarpur and Laundi were selected for the study.

4.3.1 Land Utilization

The total geographical area of the selected tahsils - Chhatarpur and Laundi was 335,048 and 1,76,399 hects. respectively out of which net area sown was 132, 616 and 1,11,964 hectares i.e. 39.57 and 66.31 per cent in 1981-82 (Table 4.6)

The culturable area in Chhatarpur tahsil was 27,539 hectaresand in Laundi Tahsil 1,57471 hectares, forming 82.19 and 89.26 per cent of the total geographical area of the respective tahsils.

The cultivated area in Chatarpur tahsil was 150361 hectares i.e. 54.60 per cent to the culturable area and 44.88 per cent to the geographical area. In Laundi tahsil cultivated area was 1,209,55 hectares which formed 76.81 per cent to the culturable area and 68.57 per cent to the geographical area of the tahsil.

The percentage of culturable waste land to culturable land in Chhatarpur tahsil was 23.34 per cent. It formed 19.18 per cent of total geographical area. Similarly in Laundi tahsil culturable waste land formed 9.98 per cent to culturable land and 8.91 per cent to total geographical area.

The double cropped area in Chhatarpur tahsil was 28724 hectares forming 21.66 per cent of its net area sown. In Laundi tahsil the double cropped area was 2231 hectares, which was only 1.91 per cent to the net area sown.

Table 4.6 Land use Classification of Chhatarpur and Laundi tahsils of Chhatarpur district. (1981-82)

S.No.	Particulars	Chhatarpur Tahsil		Laundi Tahsil	
		Area (Hect)	% to total	Area (Hect)	% to total
1.	Total Geographical Area	335048	100.00	176399	100.00
2.	Area under Forest	15980	4.77	3173	1.80
3.	Land put to Non-Agril uses	23125	6.90	9606	5.44
4.	Barren and uncultura-ble land	20552	6.14	6149	3.49
5.	Permanent pastures and other grazing land	22546	6.73	14499	8.22
6.	Area under Mise.Trees Crops and Groves not included in Net area Sown.	201	0.06	14	-
7.	Culturable Waste land	64279	19.18	15713	8.91
8.	Area under Current Fallow	17745	5.30	3991	2.26
9.	Area under other fallow land	38004	11.35	6290	3.57
10.	Net Area Sown	132616	39.57	116964	66.31
	Total Geographical Area	335048	100.00	176399	100.00
	Double Cropped Area	28724	-	2231	-
	Gross Cropped Area	161340	-	119195	-
	Percentage of Double Cropped area to Net area sown		2165		1.91

4.3.2 Source of Irrigation

Main source of irrigation in both the tahsils Chhatarpur and Laundi were wells. According to irrigation

statistics, out of the total net irrigated area in Chhatarpur tahsil 85.20 per cent was irrigated by wells only. Similarly in Laundi tahsil 73.91 per cent of net irrigated area was served by wells. Area irrigated by canals was 12.80 per cent in Chhatarpur and 3.13 per cent in Laundi tahsil. Tanks served for 1.40 per cent in Chhatarpur and 8.01 per cent in Laundi. Only 0.20 per cent was irrigated by tube-wells in Laundi tahsil. Rest 0.60 per cent in Chhatarpur tahsil and 14.75 per cent in Laundi tahsil was irrigated by other sources. Percentage of net area irrigated to net area sown formed 40.35 in Chhatarpur and only 4.21 in Laundi tahsil.(Table 4.7.)

4.3.3 Cropping Pattern

Table 4.8 presents information on cropping pattern in Chhatarpur and Laundi tahsils respectively. These tables highlight the following facts :-

1 The farm economy of both the selected tahsils was basically cereal oriented. In Chhatarpur tahsil the area under cereals was 56.93 per cent and in Laundi tahsil 51.23 per cent to the total cropped area.

2. Laundi tahsil excelled in pulse area having 35.94 per cent area under pulses. Chhatarpur tahsil had 18.23 per cent area under pulses.

3. Proportion of area under oil seeds also exceeded in Laundi tahsil (10.43 per cent). Chhatarpur had 8.18 per cent area under oil seeds.

4. In general, both the tahsils were dominated by area under food crops i.e. 74.64 per cent in Chhatarpur and 87.17 per cent in Laundi tahsil. An exceptional feature was observed with regard to the area under fodder crops which occupied 15.41 per cent in Chhatarpur and only 1.60 per cent in Laundi tahsil.

Table 4.7 Area Irrigated by different sources in Chhatarpur and Laundi tahsils (1981-82)

S.No.	Source	Chhatarpur		Laundi	
		Area (Hect.)	% to total	Area (Hect.)	% to total
1.	Canal	6851	12.80	154	3.13
2.	Tank	750	1.40	394	8.01
3.	Well	45587	85.20	3637	73.91
4.	Tube well	-	-	10	0.20
5.	Others	324	0.60	726	14.75
	Net irrigated area	53512	100.00	4921	100.00
	Area irrigated more than once	380	-	-	-
	Gross irrigated area	53892	-	4921	-
	Percentage of Net irrigated Area to Net area sown	-	40.35	-	4.21
	Percentage of Gross irrigated area to Gross cropped Area	-	33.40	-	4.21

Table 4.8 Cropping Patter in Chhatarpur and Laundi Tahsils of Chhatarpur District 1981-82.

S.No.	Crops	Chhatarpur Tahsil Area	Chhatarpur Tahsil % to total	Laundi Tahsil Area	Laundi Tahsil % to total
I.	I Cereals				
1.	Rice	6851	4.25	1821	1.53
2.	Wheat	38269	23.72	37673	31.61
3.	Jowar	11165	6.92	15753	13.22
4.	Bajra	2	-	68	0.06
5.	Barlay	15864	9.84	3783	3.17
6.	Other Cereals & Millets	19696	12.20	1960	1.64
Total Cereals & Millets		91847	56.93	61058	51.23
	II Pulses				
1.	Gram	11654	7.22	33978	28.51
2.	Arhar (Tur)	2670	1.65	5717	4.80
3.	Moong & Moth	2107	1.31	1689	1.42
4.	Urad	11003	6.82	506	0.42
5.	Masoor (Lentil)	963	0.60	895	0.75
6.	Other Pulses	182	0.11	53	0.04
	Total Pulses	28579	17.71	42838	35.94
	III Oilseeds				
1.	Linseed	841	0.52	2989	2.51
2.	Sesamum	11069	6.86	3387	2.85
3.	Greundnut	233	0.15	7	-
4.	Rape & Mustard	336	0.21	3528	2.96
5.	Other Oil Seeds	710	0.44	2518	2.11
	Total Oil Seeds	13189	8.18	12429	10.43
IV	Total Sugarcane	273	0.17	95	0.08
V	Total Fibres	502	0.31	263	0.22
VI	Total Drugs & Narcotics	184	0.11	84	0.07

Contd....

Table 4.8 Contd.....

S.No.	Crops	Chhatarpur Tahsil		Laundi Tahsil	
		Area	% to total	Area	% to total
VII	Condiments & Spices				
1.	Chillies	204	0.13	66	0.06
2.	Coriender	140	0.09	162	0.14
3.	Others	40	0.02	6	-
Total Condiments & Spices		384	0.24	234	0.20
VIII	Fruits & Vegetables				
1.	Fruits	104	0.06	18	0.01
2.	Vegetables	1420	0.88	260	0.22
Total Fruits & Vegetables		1524	0.94	278	0.23
IX	Total Fodder	24854	15.41	1916	1.60
X	Total Mise Crops	4	-	-	-
Total Crops		161340	100.00	119195	100.00

4.4 Mandla District

4.4.1 Situation

Mandla district is situated in between $22^{\circ}12'$ $23^{\circ}22'$ north latitude and $80^{\circ}18$ and $81^{\circ}50$ east longitude. It is bounded by Jabalpur district in north west, Shahdol district in north and north east, Bilaspur district in south east, Rajnandgaon and Balaghat districts in south and Seoni district in west. Mandla district has three tehsils, namely, Mandla, Niwas and Dindori.

4.4.2 Physical Features

Mandla district is full of forest clad-hilly terrains and its landscape consists of a rugged high table land in the eastern portion of the Satpura hills. The district lies almost entirely in the catchment area of river Narmada and its tributaries.

4.4.3 Climate & Rainfall

The climate of Mandla district is cool and humid. It is a hilly area with mild summer and cool frosty winter. Rainfall is fairly heavy. The monsoon sets from mid-June and continues till about early October. The average annual rainfall is 1500 m.m. and coefficient of variation in rainfall is23.00 per cent. The temprature ranges between 31.7°c in May and 17.1°c in December, the hottest and the coldest months respectively.

4.4.4 Population

Mandla district is predominantly a rural district with 92.94 per cent rural population. As per 1981 Census 5,18770 persons or 50.07 per cent population was under the category of workers. Among the workers, the cultivators

were 66.83 per cent followed by agricultural labourers 22.39 per cent. These two categories of workers constituted 89.22 per cent of the total workers. According to Census of 1981 scheduled tribes returned 60.36 per cent of total population in the district.

4.4.5 Land Utilisation

Total geographical area of Mandla district is 1,326 thousand hectares, of this, 51.86 per cent land was under non-agricultural uses. Forests occupied 43.04 per cent and the land not available for cultivation constituted 8.82 per cent. Agricultural land was 638.5 thousand hectares (48.14 per cent) and included cultivable waste (3.14 per cent), old fallow (6.09 per cent) and current fallow (5.04 per cent) pastures grazing land and grooves (3.19 per cent) and net area sown (30.68 per cent of the total geographical area in the year 1981-82). Area sown more than once accounted for 69 thousand hectares or 17.04 per cent of the net area sown. Seasonal fallow during kharif and rabi seasons was 16.47 per cent and 64.29 per cent of net area sown respectively (Table 4.9).

4.4.6 Irrigation

In respect of irrigation facilities and the area irrigated, the position of Mandla district was very miserable. Out of 407 thousand hectares of net area sown, only an area of 8.0 thousand hectares(i.e. 1.98 per cent)was irrigated. Area irrigated by different sources showed that canal was the major source by which 54.84 per cent area was irrigated. Area irrigated by wells, tanks and other sources were 26.30 per cent 0.36 per cent and 18.50 per cent respectively of net irrigated

area in the district. Percentage of gross irrigated area to gross cropped area was 1.65 per cent.(Table 4.10)

Table 4.9 Land Utilisation in Mandla district - 1981-82

S.No.	Particulars	Area	Percentage to total geographical area
1.	Area under Forest	570614	43.04
2.	Land put to Non-agricultural uses	53589	4.04
3.	Barren and unculturable land	63342	4.78
4.	Permanent pasture & other grazing land	42233	3.18
5.	Area under Mise Tree crops and groves not included in Net Area sown	196	0.01
6.	Culturable waste land	41605	3.14
7.	Area under Current fallows	66806	5.04
8.	Area under other fallow land	80808	6.09
9.	Net Area sown	406880	30.68
	Total Geographical Area	1326073	100.00
	Double cropped area	69359	
	Gross cropped Area	486239	
	Percentage of double cropped area to Net Area sown	-	17.04

4.4.7 Cropping Pattern

Mandla district comes under rice zone of Madhya Pradesh. The cropping pattern of the district was dominated by kharif crops which covered 69.09 per cent of the gross cropped area. Another important feature was that the food crops occupied 83.87 per cent of the gross cropped area. Paddy was most important crop of the district and it covered

Table 4.10 Area irrigated by different sources in Mandla district-1981-82.

S.No.	Source	Area (Hect.)	Percentage to Net Irrigated Area
1.	Canal	4411	54.84
2.	Tank	29	0.36
3.	Well	2116	26.30
4.	Tube well	-	-
5.	Others	1488	18.50
Net Irrigated Area		8044	100.00
Gross Irrigated Area		8044	-
Percentage of Net Irrigated Area to Net Area sown		-	1.98
Percentage of Gross Irrigated Area to Gross Cropped Area		-	1.65

26.70 per cent followed by kodo-kutki having 25.77 per cent area. Wheat occupied 16.23 per cent of the gross cropped area. The other crops included pulses 8.59 per cent, oilseeds 15.15 per cent and the remaining crops like vegetables, fruits, spices, fibres and other crops had no say in cropping pattern and constituted only 0.94 per cent of the gross cropped area. The proportion of cash crops was 15.3 per cent in the cropping pattern of the district (Table 4.11)

4.5 Selected Tehsils of Mandla District

There are three tehsils i.e. Mandla, Dindori and Niwas in Mandla district. Two tehsils, Mandla and Dindori were selected.

Table 4.11 Cropping Pattern in Mandla district - 1981-82

S.No.	Crops	Area (Hect.)	% to Gross Cropped Area
	I CEREALS		
1.	Rice	129816	26.70
2.	Wheat	78913	16.23
3.	Jowar	680	0.14
4.	Barley	435	0.09
5.	Maize	28395	5.84
6.	Ragi	35	-
7.	Kodon-kutki	125280	25.77
8.	Sawa	2047	0.42
9.	Other Cereals	729	0.15
	6		
Total Cereals		366330	75.34
	II PULSESS		
1.	Gram	16146	3.32
2.	Arhar (Tur)	2872	0.59
3.	Moong & Moth	47	0.01
4.	Lentil (Masur)	6862	1.41
5.	Urad	8251	1.70
6.	Pea	6215	1.28
7.	Other Pulses	1359	0.28
Total Pulses		41752	8.59
	III OILSEEDS		
1.	Linseed	9907	2.04
2.	Sesamum	3486	0.72
3.	Groundnut	20	-
4.	Rape & Mustard	26070	5.37
5.	Soybean	205	0.04
6.	Ramtil	33952	6.98
7.	Others	7	-
Total Oil Seeds		73647	15.15

S.NO.	Crops	Area (Hect.)	% to Gross Cropped Area
	IV SUGARCANE	1502	0.31
	V FIBRES		
1.	Cotton	-	-
2.	Sunhemp	963	0.20
3.	Other Fibres	1	-
Total Fibres		964	0.20
	VI DRUGS & NARCOTICS		
1.	Tobacco	23	0.01
2.	Pan	15	-
3.	Others	-	-
Total		38	0.01
	VII CONDIMENTS & SPICES		
1	Chillies	140	0.03
2.	Garlic	14	-
3.	Coriender	399	0.08
4.	Others	22	-
Total Condiment & Spices		556	0.11
	VIII Total Fruits & Vegetables	1433	0.29
	IX FODDER CROPS	17	-
	X MISE. CROPS	-	-
TOTAL ALL CROPS		486239	100.00

4.5.1 Land Utilisation

Total gegrophical area of tehsil Mandla and Dindori is 342.6 and 227.2 thousand hectares respectively. In Mandla tahsil 27.57 per cent land was under non-agricultural uses and the remaining 72.43 per cent was arable land, similarly 15.32 per cent in Dindori tahsil was under non-agricultural uses and 84.68 per cent was arable land. Percentage of cultivated area to arable land was 72.73 per cent and the percentage of cultivated area to total geographical area was 52.67 per cent in Mandla tehsil. In Dindori tehsil 78.64 per cent of arable land was cultivated. It formed 66.58 per cent of total geographical area. Percentage of culturable waste land to culturable or arable land was 17.71 per cent and it formed 12.83 per cent of total geographical area in Mandla tehsil. In Dindori tehsil it formed 16.48 per cent and 13.96 per cent respectively.

Percentage of double cropped area to net area sown was 21.25 per cent and 17.61 per cent in Mandla and Dindori tehsils respectively (Table 4.12).

4.5.2 Irrigation

In respect of irrigation facilities and the area irrigated, the position of both the selected tehsils i.e. Mandla and Dindori was miserable. Percentage of net irrigated area to net area sown was 4.22 per cent in Mandla and 0.30 per cent in Dindori tehsil. Major source of irrigation in both the tehsils were canals by which 51.15 per cent of total irrigated area was irrigated in Mandla and 66.17 per cent in Dindori. Second important source were wells by which 30.12 per cent was irrigated in Mandla tehsil and 11.11 per cent in Dindori tehsil.

Table 4.12 Land Utilisation in Selected Tehsils of Mandla District (1981-82)

(Area in Hectares)

S.No.	Particulars	Mandla		Dindori	
		Area	Percentage to total geographical area	Area	Percentage to total geographical area
1.	Area under Forest	42778	12.48	11330	4.99
2.	Land put to Non-agril. uses	24915	7.27	12257	5.39
3.	Barren & unculturable land	26788	7.82	11242	4.94
4.	Permanent pasture and other grazing land	23616	6.89	9360	4.12
5.	Area under Mise.Tree crops & groves not included in Net area sown	101	0.03	9	0.00
6.	Culturable waste land	18022	5.26	10137	4.46
7.	Area under current fallow	22360	6.53	18719	8.24
8.	Area under other fallow land	25938	7.57	21577	9.50
9.	Net Area sown	158116	46.15	132610	58.36
	Total Geographical Area	342634	100.00	227240	100.00
	Double cropped Area	33600	-	23351	-
	Gross cropped Area	191716	-	155961	-
	Percentage of double cropped area to Net Area sown	-	21.25	-	17.61

Tanks and other sources together irrigated 18.73 per cent area in Mandla and 22.92 per cent in Dindori tehsil.

Percentage of gross irrigated area to gross cropped area was 3.48 per cent in Mandla and 0.25 per cent in Dindori tehsil. (Table 4.13).

Table 4.13 Area Irrigated by Different Sources in Selected Tahsils of Mandla District.(1981-82)

(Area in hectares)

S.No.	Sources	Mandla		Dindori	
		Area	Percentage to Net Irrigated Area	Area	Percentage to Net Irrigated Area
1.	Canal	3415	51.15	268	66.17
2.	Tank	29	0.43	-	-
3.	Well	2011	30.12	45	11.11
4.	Tube Well	-	-	-	-
5.	Others	1222	18.30	92	22.92
	Net Irrigated Area	6677	100.00	405	100.00
	Gross Irrigated Area	6677	-	405	-
	Percentage of Net Irrigated Area to Net Area sown	-	4.22	-	0.30
	Percentage of Gross Irrigated Area to Gross Cropped Area	-	3.48	-	0.25

4.5.3 Cropping Pattern

The cropping pattern of Mandla and Dindori tehsils was dominated by Kharif crops which covered 65.58 per cent and 64.85 per cent of the gross cropped area in the respective tehsils . Another important feature of cropping pattern was that cereal crops occupied 79.77 per cent area in Mandla and 72.88 per cent in Dindori. Paddy was the most important crop of both the tehsils. It covered 36.32 per cent of gross cropped area in Mandla and 23.75 per cent in Dindori followed by kodon-kutki having 22.04 and 23.90 per cent respectively. Wheat was the third important crop in both tehsils having

15.17 per cent and 19.64 per cent area respectively. Other crops included pulses 8.82 per cent and 7.02 per cent, Oilseeds 9.42 per cent and 19.91 per cent in Mandla and Dindori tehsils respectively. Crops like vegetables, fruits, spices, fibres and other crops had negligeble area in cropping pattern of both the tehsils. They occupied 1.99 per cent area in Mandla and 0.19 per cent of the gross cropped area in Dindori tehsil. (Table 4.14)

Table 4.14 Cropping Pattern in Selected Tehsils of Mandla District (1981-82)

(Area in hectares)

S.No.	Crops	Mandla		Dindori	
		Area	% to Gross Cropped Area	Area	% to Gross Cropped Area
I	CEREALS				
1.	Rice	69630	36.32	37034	23.75
2.	Wheat	29085	15.17	30624	19.64
3.	Jowar	300	0.16	130	0.09
4.	Barley	61	0.03	18	0.01
5.	Maize	9844	5.14	8157	5.23
6.	Ragi	35	0.02	-	-
7.	Kodon-kutki	42262	22.04	37282	23.90
8.	Sawa	1036	0.54	124	0.08
9.	Other Cereals	682	0.35	277	0.18
	Total Cereals	152935	79.77	113646	72.88
II	PULSES				
1.	Gram	4292	0.24	5816	3.73
2.	Arhar (Tur)	532	0.28	552	0.36
3.	Moong & Moth	40	0.02	2	-

Table Contd.... ...

Table 4.14 contd.....

S.No.	Crops	Mandla		Dindori	
		Area	% to Gross Cropped Area	Area	% to Gross Cropped Area
4.	Lentil	4430	2.31	971	0.62
5.	Urad	1939	1.01	2519	1.62
6.	Pea	4409	0.63	971	0.63
7.	Other Pulses	1260	0.66	91	0.06
	Total Pulses	16902	8.82	10933	7.02
III	OILSEEDS				
1.	Linseed	4764	2.50	4121	2.64
2.	Sesamum	1883	0.98	172	0.11
3.	Groundnut	8	-	2	-
4.	Rape & Mustard	8418	4.39	8206	5.26
5.	Soybean	150	0.08	51	0.04
6.	Ramtil	2824	1.47	18491	11.86
7.	Others	7	-	-	-
	Total Oilseeds	18054	9.42	31043	19.91
IV	Sugarcane	1478	0.78	22	0.01
V	FIBRES				
1.	Cotton	-	-	-	-
2.	Sunhemp	694	0.36	61	0.03
3.	Other Fibres	1	-	-	-
	Total Fibres	695	0.36	61	0.03
VI	DRUGS & NARCOTICS				
1.	Tobacco	13	-	4	0.00
2.	Pan	15	0.01	-	-
3.	Others	-	-	-	-
	Total	28	0.01	4	0.00

Contd.....

Table 4.14 Contd .....

S.No.	Crops	Mandla Area	Mandla % to Gross Cropped Area	Dindori Area	Dindori % to Gross Cropped Area
VII	CONDIMENTS & SPICES				
1.	Chillies	72	0.04	19	0.01
2.	Garlic	7	-	2	-
3.	Coriender	188	0.10	170	0.11
4.	Other	3	-	-	-
	Total Condiments and Spices	270	0.14	191	0.12
VIII	Total Fruits & Vegetables	1340	0.70	58	0.03
IX	Fodder Crops	14	0.00	3	0.00
X	Misc. Crops	-	-	-	-
Total All Crops		191716	100.00	155961	100.00

4.4 Selected Villages

In all eight villages were selected for the study. Four villages from the two selected tehsils of Chhatarpur district and another four villages from the two selected tehsils of Mandla district -

Districts	Tahsils	Villages
1. Chhatarpur	1. Chhatarpur	1. Soura 2. Ganj
	2. Laundi	3. Madha 4. Hardwar
2. Mandla	1. Mandla	1. Katra 2. Siktra
	2. Dindori	3. Sukka 4. Shahpur

Location of these villages in the selected tahsils of the respective districts are shown the Map 4.1

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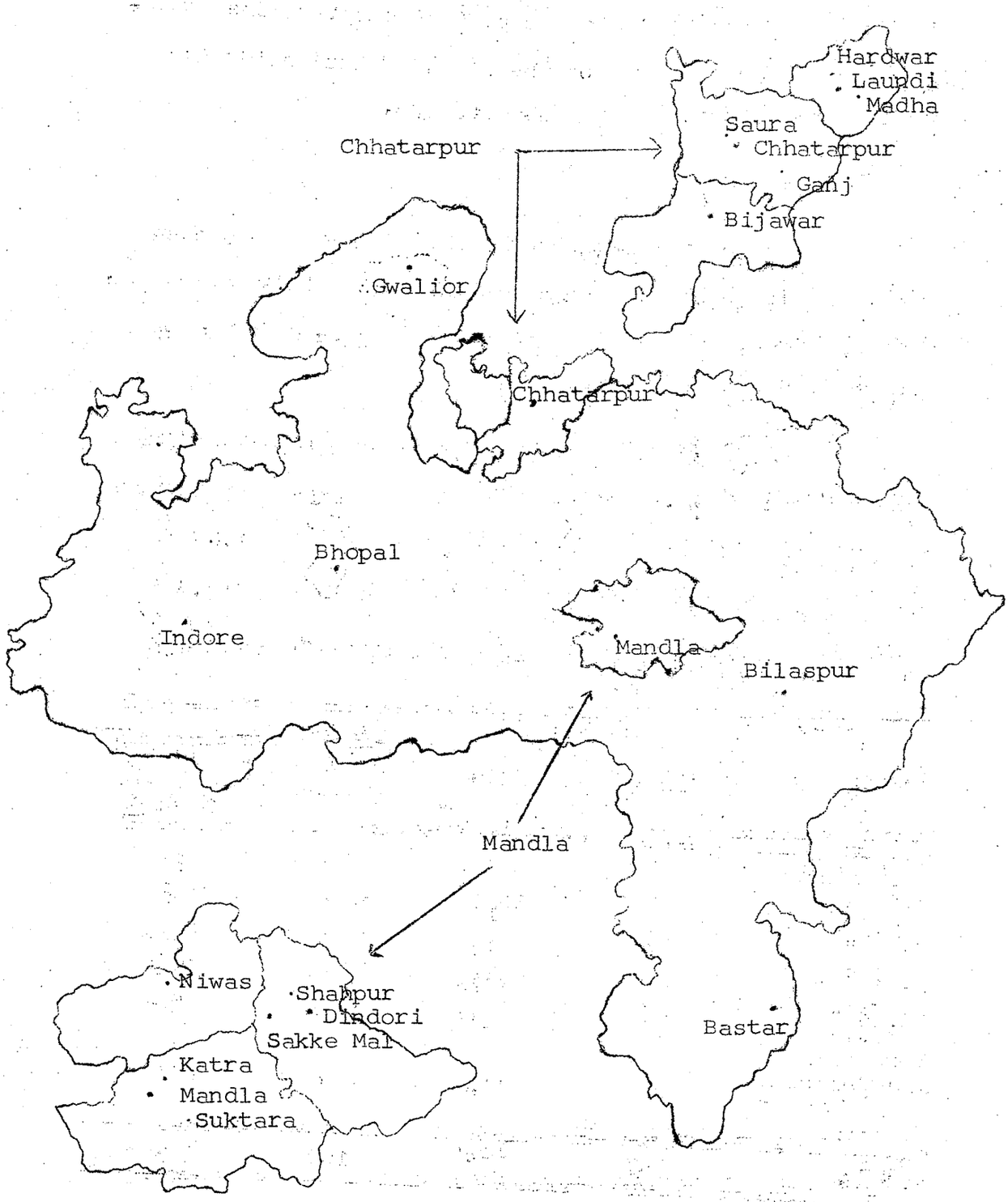
Map of Madhya Pradesh showing the Selected Districts.



CHAPTER V

CHARACTERISTICS OF SAMPLE FARMS

As already mentioned the sample comprised 200 cultivating households : one hundred each in Chhatarpur and Mandla districts. In the present chapter some socio-economic charateristics of the selected households and their farm structure have been studied.

5.1 Family size

Highest number of families had 6 to 8 members each. Their number in Chhatarpur was 37 and in Mandla 33. Next in number were 3 to 5 member families-32 in Mandla and 26 in Chhatarpur (Table 5.1)

Average size of family in Chhatarpur was 7.89 and in Mandla 7.94. In the different holding size groups the average size of family varied from 6.44 to 11.00 in Chhatarpur and from 5.86 to 10.5 in Mandla (Table 5.2)

Table 5.1 Distribution of Sample Households accoring to Family Size

Family size groups	Chhatarpur		Mandla	
	No. of house holds	Total Family Member	No. of house-holds	Total Family Member
2 Members	2	4	5	10
3-5 "	26	108	32	146
6-8 "	37	246	33	234
9-12 "	21	213	17	192
12.16 "	10	136	4	56
More than 16 Members	4	82	9	156
TOTAL	100	789	100	794

Table 5.2 Average Family Size and Economically Active Members in Different Holding Size Groups

Holding size Groups (Hect.)	C H H A T A R P U R						M A N D L A					
	No.of House-holds	Total Family Members	Average Family Size	Economically Active Members			No.of House-holds	Total Family Member	Average Family Size	Economically Active Members		
				Farm Workers	Other Workers	Total				Farm Workers	Other Workers	Total
Below 1 Hect.	18	116	6.44	52 (2.89)	9	61	28	164	5.86	98 (3.50)	10	108
1-2 "	27	175	6.48	81 (3.00)	7	88	28	224	8.00	115 (4.11)	21	136
2-4 "	30	236	7.87	114 (3.80)	9	123	24	223	9.29	122 (5.08)	12	134
4-8 "	18	185	10.28	100 (5.56)	6	106	12	96	8.25	46 (3.83)	5	51
8 & above	7	77	11.00	42 (6.00)	4	46	8	84	10.50	40 (5.00)	1	41
All Farmers	100	789	7.89	389 (3.89)	35	424	100	794	7.94	421 (4.21)	49	470

Note : Figures in parenthesis are averages.

5.2 Economically Active Members

All men, women and children who were engaged in some productive work were treated as 'workers' or economically active members. In Chhatarpur 53.74 per cent of family members were economically active out of which 91.74 per cent were working on their own farms. In Mandla 59.19 per cent family members were economically active and 89.57 per cent of this working force was engaged on their own farms.

The average number of economically active members per household was 4.24 in Chhatarpur and 4.70 in Mandla (Table 5.2).

5.3 Land Holding

Land holding pattern of the sample farmers has been studied under two heads-(i) owned land and (ii) operated area.

5.3.1 Owned Land

Average size of owned land was 3.00 hectares in Chhatarpur and 2.58 hectares in Mandla. Percentage of cultivated land to total owned land was 88.95 in Chhatarpur and 94.52 in Mandla. The average area of cultivated owned land per household was 2.67 hectares in Chhatarpur and 2.44 hectares in Mandla. The difference between the average of cultivated owned land and total owned land i.e. 0.33 hectares in Chhatarpur and 0.14 hectares in Mandla was mainly accounted for by the existence of waste land called unculturable land. The proportion of this unculturable land in the total owned land of sample farmers was 11.05 per cent in Chhatarpur and 5.48 per cent in Mandla (Table 5.3).

Table 5.3 Utilisation of Owned Land on Sample Farms of Chhatarpur and Mandla Districts

Particulars	CHHATARPUR			MANDLA		
	Area (Hect.	Average Size	Percentage	Area (Hect.)	Average Size	Percentage
Net Area Sown	256.26	2.56	85.38	220.78	2.21	85.61
Fallow Land	10.71	0.11	3.57	22.99	0.23	8.91
Cultivated Owned Land	266.97	2.67	88.95	243.77	2.44	94.52
Unculturable Land	33.15	0.33	11.05	14.13	0.14	5.48
Total Owned Land	300.12	3.00	100.00	257.90	2.58	100.00

It is evident from the Table 5.4 that the proportion of owned net area sown varied in different size groups from 82.80 per cent to 100 per cent in Chhatarpur and 72.30 per cent to 93.87 per cent in Mandla. The proportion of fallow land varied from zero per cent to 6.44 per cent in Chhatarpur while in Mandla it ranged from 2.12 per cent to 16.99 per cent in different size groups.

5.3.2 Operated Area

On account of certain leasing-in and leasing out of land the operated area differed from the total owned land. Table 5.5 gives a clear picture of the difference in total owned, cultivated owned, total operated land and net area sown in both the samples.

Table 5.5 Owned and Operated Land of Sample Farms in Chhatarpur and Mandla

(Area in Hectares)

Chhatarpur Area of Sample Farms (Hectares)	Particulars	Mandla Area of Sample farms (Hectares)
300.12	Total Owned Land	257.90
(-) 33.15	Unculturable Land	(-) 14.13
-	Leased-out land	-
266.97	Cultivated Owned Land	243.77
(+) 7.26	Leased-in land	(+) 6.03
274.23	Total Operated Land	249.80
(-) 10.71	Fallow Land	(-) 22.99
263.52	Net Cultivated Land Or Net Area Sown	226.81

Table 5.4 Land Utilisation of Owned Land on Sample Farms in Different Size Groups.

Size Group (Hectares)	CHHATARPUR								MANDLA							
	Owned Net Area Sown		Fallow		Unculturable		Total Owned Land		Owned Net Area Sown		Fallow		Unculturable		Total Owned Land	
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
Below 1 Hect.	11.93	100.00	-	-	-	-	11.93	100.00	11.33	72.30	1.47	9.38	2.87	18.32	15.67	100.00
1-2 "	32.51	87.08	0.20	0.54	4.62	12.38	37.33	100.00	29.56	75.85	6.62	16.99	2.79	7.16	38.97	100.00
2-4 "	64.58	86.93	0.90	1.21	8.81	11.86	74.29	100.00	61.07	93.87	3.59	5.52	0.40	0.61	65.06	100.00
4-8 "	82.85	83.64	6.37	6.44	9.62	9.72	98.94	100.00	50.87	81.81	9.70	15.60	1.61	2.59	62.18	100.00
8 & above	64.29	82.82	3.24	4.17	10.10	13.01	77.63	100.00	67.95	89.38	1.61	2.12	6.46	8.50	76.02	100.00
All Farms	256.26	85.38	10.71	3.57	33.15	11.05	300.12	100.00	220.78	85.61	22.99	8.91	14.13	5.48	257.90	100.00

Average size of operated holding was 2.74 hectares in Chhatarpur and 2.50 hectares in Mandla. Average lased-in land per farm was 0.07 hectared in Chhatarpur and 0.06 hectares in Mandla (Table 5.6)

Table 5.6 Operated area of Sample Farms of Chhatarpur and Mandla District

(Area in Hectares)

Particulars	Chhatarpur		Mandla	
	Total Area	Average per farm	Total Area	Average per farms
Owned Land	266.97	2.67	243.77	2.44
Leased-in land	7.26	0.07	6.03	0.06
Total operated land	274.23	2.74	249.80	2.50

Average operated area per farm in different holding size groups varied from 0.82 hectare to 9.65 hects. in Chhatarpur and 0.50 hectare to 8.80 hectares in Mandla (Table 5.7).

Table 5.7 Total and Average size of Operated Area in Different categories of Sample Farms

Area in hectares)

Size groups	Chhatarpur		Mandla	
	Total operated Area	Average Operated Area	Total Operated Area	Average operated Area
(Below 1.0 hect.)	14.75	0.82	13.87	0.50
1 - 2	34.33	1.27	37.80	1.35
2 - 4	68.30	2.28	67.19	2.80
4 - 8	89.32	4.96	60.57	5.63
8 and above	67.53	9.65	70.37	8.80
All Farms	274.23	2.74	249.80	2.50

5.4 Level of Intensification

The effective size of land holding is determined by the intensity with which the land is being cultivated. The level of intensification is generally measured in three ways -

1. Intensity of land use
2. Intensity of cropping :-
   (a) Gross Acre Intensity
   (b) Season Acre Intensity

5.4.1 Intensity of Land Use

The intensity of land use in expressed as percentage of net cropped area to total operational area. In some cases land use intensity in less than 100 because of the current fallow. Land use intensity on sample farms of Chhatarpur was 96.09 per cent and in Mandla 90.80 per cent. The reason is apparent. In Chhatarpur 3.91 per cent of the total operated land of sample farms was fallow while on Mandla farms it was 9.20 per cent. In Chhatarpur land use intensity was higher on small farms than on large farms. In Mandla there was no definite trend, land use intensity was highest(97.71 per cent) in largest group and lowest(82.49 per cent)in the second group (Table 5.8).

5.4.2 Intensity of Cropping

Intensity of cropping is worked out in two ways. Firstly, gross acre intensity, viz, the gross cropped area as percentage of net cropped area, and secondly the season acre intensity viz, the season acres as percentage of net cropped area. The different between the two in accounted for by the difference in the duration of various crops. For example,

viewed from the angle of land being in effective use, one acre under Arhar (Tur) crop is equivalent to two season acres as compared with one season acre for a single season crop like Jowar.

Table 5.8 Intensity of Land use on operated Area of sample Farms

Size groups (Hect.)	CHHATARPUR			MANDLA		
	Operated Area (Hect.)	Net Cropped Area (Hect.)	Land Use Intansity (%)	Operated Area (Hect.)	Net Cropped Area (Hect.)	Land use Intensity (%)
Below 1 Hect.	14.75	14.75	100.00	13.87	12.40	89.40
1 - 2 "	34.33	34.13	99.42	37.80	31.18	82.49
2 - 4 "	68.30	67.40	98.68	67.19	63.60	94.66
4 - 8 "	89.32	82.95	92.87	60.57	50.87	83.99
8 & above	67.53	64.29	95.21	70.37	68.76	97.71
All farms	274.23	263.52	96.09	249.80	226.81	90.80

(a) Gross Acre Intensity

On the whole the gross acre intensity generally termed as intensity of cropping was 128.96 per cent on sample farms of Chhatarpur and 134.07 per cent on Mandla farms.

The gross acre intensity in Chhatarpur was highest in the holding size group of 4-8 hectares (130.46 per cent) and lowest on sample farms of less than one hectare (124.67 per cent).(Table 5.9)

In Mandla the highest gross acre intensity was in the holding size group of 2-4 hectares (139.81 per cent), and lowest, in the size group of 1-2 hectares (121.62 per cent).

Table 5.9 Gross Acre Intensity (Intensity of cropping) on operated Area of Sample Farms

Size Group (Hect.)	C H H A T A R P U R				M A N D L A			
	Net cropped Area (Hect.)	Double Cropped Area (Hect.)	Gross Cropped Area (Hect.)	Intensity of cropping (%)	Net cropped Area (Hect.)	Double Cropped Area (Hect.)	Gross Cropped Area (Hect.)	Intensity of cropping (%)
Below 1 Hect.	14.75	3.64	18.39	124.67	12.40	4.57	16.97	136.85
1-2 "	34.13	9.29	43.42	127.22	31.18	6.74	37.92	121.62
2-4 "	67.40	20.33	87.73	130.16	63.60	25.32	88.92	139.81
4-8 "	82.95	25.27	108.22	130.46	50.87	17.01	67.88	133.44
8 and above	64.29	17.80	82.09	127.68	68.76	23.65	92.41	134.39
All Farms	263.52	76.33	339.85	128.96	226.81	77.29	304.10	134.07

(b) Season Acre Intensity

As indicated earlier the divergence between the gross acre and the season acre intensity is accounted for by the varying gestation period of the different crops. The season acre intensity on sample farms was 133.76 per cent in Chhatarpur and 135.41 per cent in Mandla. The difference between season acre intensity and cropping intensity in Chhatarpur was 4.80 and in Mandla 1.34 indicating that perennial crops were more common in Chhatarpur than Mandla. (Table 5.10)

In Chhatarpur season acre intensity varied from 128.06 per cent to 137.04 per cent in different size groups . (Table 5.10) In Mandla the variation was from 121.61 cent to 140.62 per cent. (Table 5.11)

5.5 Irrigation

The intensification of farm activities is largely determined by the irrigation facilities. The availability of irrigation affects the intensity of cropping through the cropping pattern.

In Chhatarpur 65 per cent of the sample farmers had irrigation facilities (Table 5.12) and most of them had wells. The proportion of irrigated area on the farms was 42.55 per cent. Excluding the lowest size group in which the irrigated area was 33.40 per cent in other groups the percentage of irrigated area increased with the size group (Table 5.13).

Table 5.10 Season Acre Intensity on Sample Farms of Chhatarpur District

Size Group	Net Area Sown	Kharif				Rabi				Total Cropped Area in the year	Season Acre Intensity
		Seasonal Fallow	Cropped Area			Seasonal Fallow	Cropped Area				
			Crop sown Area	Area of Prev. Standing Crop	Total cropped Area		Crop sown Area	Area of Prev. Standing Crop	Total Cropped Area		
Below 1 Hect.	14.75	4.45	10.30	-	10.30	6.16	8.09	0.50	8.59	18.89	128.06
1-2 "	34.13	15.60	18.53	-	18.53	8.74	24.89	0.50	25.39	43.92	128.69
2-4 "	67.40	24.81	42.59	-	42.59	17.62	46.14	3.64	49.78	92.37	137.04
4-8 "	82.95	34.99	47.96	-	47.96	18.69	60.26	4.00	64.26	112.22	135.28
8 and above	64.29	28.88	35.41	-	35.41	14.61	45.68	4.00	49.68	85.09	132.35
All Farms	263.52	108.73	154.79	-	154.79	65.82	185.06	12.64	197.70	352.49	133.76

Table 5.11 Season Acre Intensity on Sample Farms of Mandla District

Si.	Group	Net Area Sown	Kharif				Rabi				Total Cropped Area in the year	Season Acre Intensity (%)
			Seasonal Fallow	Crop sown Area	Area of Prev. Standing Crop	Total Cropped Area	Seasonal Fallow	Crop sown Area	Area of Prev. Standing Crop	Total Cropped Area		
Below	1 Hect.	12.40	0.54	11.86	-	11.86	7.29	5.11	-	5.11	16.97	136.85
1-2	"	31.18	4.19	26.99	-	26.99	20.25	10.93	-	10.93	37.92	121.61
2-4	"	63.60	13.59	49.49	0.52	50.01	24.17	39.43	-	39.43	89.44	140.62
4-8	"	50.87	17.10	32.77	1.00	33.77	15.25	35.11	0.51	35.62	69.39	136.40
8 and above		68.76	10.51	57.25	1.00	58.25	33.60	35.16	-	35.16	93.41	135.84
All Farms		226.81	45.93	178.36	2.52	180.88	100.56	125.74	0.51	126.25	307.13	135.41

Table 5.12 Percentage of Farms having Irrigation Facility in different Size Groups of Sample Farms

Size Groups	CHHATARPUR			MANDLA		
	No.of Farms	No.of Farms having Irriga-tion.	% of Farms having Irri-gation	No.of Farms	No.of Farms having Irri-gation	% of Farms having Irri-gation
1. Below-1 Hect.	18	7	38.89	28	-	-
2. 1 - 2 "	27	11	40.74	28	-	-
3. 2 - 4 "	30	24	80.00	24	4	16.67
4. 4 - 8 "	18	16	88.89	12	1	8.33
5. 8 & above	7	7	100.00	8	2	25.00
All Farms	100	65	65.00	100	7	7.00

In Mandla only seven per cent of the sample farmers had irrigation (Table 5.12). Irrigated area formed 7.47 per cent of total operated area (Table 5.13).

In Chhatarpur the percentage of irrigated area to total operated area varied from 26.10 per cent in the second holding size group to 57.49 per cent in the size group of 8 hectares and above (Table 5.13).

Table 5.13 Percentage of Area Irrigated on Sample Farms in Different Size Groups.

Size Groups	CHHATARPUR			MANDLA		
	Total Operated Area	Irrigated Area	% of Irrigated area to total operated area of sample farms	Total Operated Area	Irrigated Area	% of Irrigated atea to total operated area of sample farms
Below 1 Hect.	14.75	4.94	33.40	13.87	-	-
1 - 2 "	34.33	8.96	26.10	37.80	-	-
2 - 4 "	68.30	26.14	38.27	67.19	6.11	9.09
4 - 8 "	89.32	37.83	42.35	60.57	1.62	2.67
8 & above	67.53	38.82	57.49	70.37	10.93	15.53
Total Farms	274.23	116.69	42.55	249.80	18.66	7.47

In Mandla irrigated area in the first two size groups were nil and the highest proportion i.e. 15.53 per cent irrigated area was found in the highest size group of 8 hectares and above (Table 5.13)

The percentage of irrigated area on farms having irrigation facilities was 49.98 per cent in Chhatarpur and 50.67 per cent in Mandla (Table 5.14).

Table 5.14 Percentage of Area Irrigated to Total Operated Agrea on Sample Farms having Irrigation Facility

Sige - groups	CHHATARPUR			MANDLA		
	Total operated Area of farms having irriga-tion	Irriga-ted Area	% of irriga-ted Area to operated area of farms having irriga-tion	Total operated Area of farms having irriga-tion	Irriga-ted Area	% of irriga-ted Area to operated area of farms having irriga-tion
Below 1 Hect.	5.34	4.94	92.51	-	-	-
1 - 2 "	23.20	8.96	38.62	-	-	-
2 - 4 "	59.41	26.14	43.99	13.76	6.11	44.40
4 - 8 "	75.57	37.83	50.06	5.67	1.62	28.57
8 & above	69.95	38.82	55.50	17.40	10.93	62.82
Total Farms	233.47	116.69	49.98	36.83	18.66	50.67

5.6 Cropping Pattern :

In Chhatarpur rabi crops dominated by occupying 54.45 per cent of gross cropped area as compared to kharif crops which occupied 45.55 per cent area. The situation in Mandla was reverse where kharif crops occupied 58.65 per cent area as compared to rabi crops which were grown on only 41.35 per cent gross cropped area (Table 5.15).

In Chhatarpur the dominating crops were wheat, gram and barley of rabi season which occupied 33.00, 9.02 and 8.27 per cent of gross cropped area respectively. In kharif minor millets (Basara, Kodon, Sawa and Kutki) occupied 11.97 per cent gross cropped area. The other important kharif crops were Jowar and rice. Mixed crops occupied important position in the

Table 5.15 Cropping Pattern of Sample Farms in Chhatarpur and Mandla Districts

Kharif Crops	CHHATARPUR			MANDLA		
	Area (Hect)	% to total area under Kharif Crops	% to Gross Cropped Area	Area (Hect)	% to total area under Kharif Crops	% to Gross Cropped Area
Rice	17.40	11.24	5.12	129.21	72.44	42.49
Jowar	9.11	5.88	2.68	-	-	-
Maize	-	-	-	6.98	3.91	2.29
Kodon	9.41	6.08	2.77	14.43	8.09	4.76
Sawa	8.02	5.18	2.36	0.24	0.14	0.07
Kutki	0.61	0.39	0.18	4.95	2.78	1.63
Basara	22.65	14.64	6.66	-	-	-
Arhar	6.78	4.38	1.99	-	-	-
Urad	28.43	18.38	8.37	1.66	0.93	0.54
Moong	4.46	2.88	1.31	-	-	-
Soyabean	-	-	-	1.12	0.63	0.37
Jowar Kodon	0.81	0.52	0.24	-	-	-
Jowar Moong	22.65	14.63	6.66	-	-	-
Kodon Kutki	-	-	-	2.31	1.29	0.76
Kodon Moong	0.81	0.52	0.24	-	-	-
Kodon Tur	1.21	0.78	0.36	0.51	0.29	0.17
Urad Arhar	2.43	1.57	0.71	-	-	-
Urad Til	3.24	2.09	0.95	-	-	-
Arhar Til	1.62	1.05	0.48	-	-	-
Sugarcane	-	-	-	-	-	-
Ramtil(Jagni)	-	-	-	16.19	9.08	5.32
Sunhemp	0.50	0.32	0.15	0.76	0.42	0.25
Vegetables	1.40	0.91	0.42	-	-	-
Til	13.25	8.56	3.90	-	-	-
Total Kharif	154.79	100.00	45.55	178.36	100.00	58.65

Contd .....

Table 5.15 Contd....

Rabi Crops	CHHATARPUR			MANDLA		
	Area (Hect.)	% to total area under Rabi crops	% to Gross Cropped Area	Area (Hect.)	% to total area under Rabi crops	% to Gross Cropped Area
Wheat	112.14	60.60	33.00	88.95	70.74	29.25
Barley	28.10	15.18	8.27	-	-	-
Gram	30.66	16.56	9.02	4.75	3.78	1.56
Masoor	0.20	0.11	0.06	8.54	6.79	2.81
Batra	-	-	-	2.12	1.69	0.69
Pea	-	-	-	8.00	6.36	2.63
Wheat Barley	0.81	0.44	0.24	-	-	-
Wheat Barley Gram	1.62	0.88	0.48	-	-	-
Gram Batra	1.01	0.55	0.30	-	-	-
Wheat Gram Linseed Sahua	2.43	1.31	0.71	-	-	-
Wheat Gram	-	-	-	1.11	0.88	0.37
Gram Linseed	-	-	-	0.51	0.41	0.17
Sugarcane	-	-	-	3.03	2.41	1.00
Potato	-	-	-	0.04	0.03	0.01
Linseed	3.04	1.64	0.89	5.52	4.39	1.82
Mustard	1.42	0.77	0.42	-	-	-
Rai	-	-	-	2.16	1.72	0.71
Vegetables	3.63	1.96	1.06	1.01	0.80	0.33
Total Rabi Crop	185.06	100.00	54.45	125.74	100.00	41.35
Gross Cropped Area	339.85		100.00	304.10		100.00

cropping pattern of sample farm in this district. In kharif mixed crops occupied 9.64 per cent of gross cropped area while in rabi they occupied only 1.73 per cent area.

In Mandla the most dominating crop was rice (42.49 per cent) followed by wheat (29.25 per cent). Other crops occupying important place in cropping pattern were kodon (4.76 per cent) Masoor (2.81 per cent) pea (2.63 per cent) maize (2.29 per cent) and gram (1.56 per cent). Mixed crops were not so important in Mandla as were in Chhatarpur.

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CHAPTER VI

EXTENT AND REASONS OF FALLOW

6.1 Unculturable Land

In the course of investigation it was found that some unculturable land was also owned by the farmers. Though included in their total holding (i.e. owned land) such land was reported to be barren, stoney, rocky or unfertile and never brought under cultivation. Therefore it was excluded from the operated holding.

The proportion of such land to total owned land was 11.04 per cent in Chhatarpur and 5.48 per cent in Mandla. The average area of such land per holding was 0.33 hect. in Chhatarpur and 0.14 hectare in Mandla. It may be noted that the proportion of unculturable land was 12.03 per cent in Chhatarpur* and 4.78 per cent in Mandla* district.(Table 4.7)

Such land had little economic importance from the crop production point of view. The other uses to which it was put to were threshing floor, grazing ground, supply of fuel wood (from the wild shrubs, bushes or trees) and supply of stone, mud or soil for construction purposes. The poor fertility status of this land was one reason on account of which it was not reclaimed, and the other being that its reclamation or improvement cost was considered to be very high and uneconomic. However, the possibility of some culturable land being included in the above mentioned land on account of wrong reporting can not be ruled out but as the reported area was not put under cultivation at any time it was kept separate from the fallow area under study.

* Refer Table 4.2 page 33
+ Refer Table 4.9 page 4

Table 6.1 Unculturable Land on Selected Farms

Size Group (Hectare)	CHHATARPUR					MANDLA				
	No. of Farms	Total Owned Land (Hect.)	Unculturable Land			No.of Farms	Total Owned Land (Hect.)	Unculturable Land		
			Area (Hect.)	Average Area	Percentage to total Owned Land			Area (Hect.)	Average Area	Percentage to total Owned Land
Below 1 Hect.	18	11.93	-	0.00	0.00	28	15.67	2.86	0.10	18.32
1 - 2 "	27	37.33	4.65	0.17	12.37	28	38.97	2.79	0.09	7.16
2 - 4 "	30	74.29	8.80	0.29	11.86	24	65.06	0.40	0.01	0.61
4 - 8 "	18	98.94	9.60	0.53	9.72	12	62.18	1.62	0.13	2.59
8 and above	7	77.63	10.10	1.44	13.01	8	76.02	6.46	0.81	8.50
All Farms	100	300.12	33.15	0.33	11.04	100.	257.90	14.13	0.14	5.48

6.2 Fallow Land

As already indicated in Chapter III the problem of fallow land in this state is not serious. Having only 3.96 per cent of total reporting area under fallow this state stood eleventh in the country in this respect.

(a) Extent

Fallow land including current fallow and other fallow on sample farms was 10.71 hectares in Chhatarpur and 22.99 hectares in Mandla. Its proportion to total operated area was 3.91 per cent and 9.20 per cent respectively. The average area of fallow land per farm was 0.11 and 0.23 hect. in Chhatarpur and Mandla respectively.

In Chhatarpur the average fallow land increased with the size group. While in the lowest size group there was no fallow land, it was 0.01 hectare in the second group and 0.46 hectare in the largest size group. In Mandla no such tendency was visible. However, it was lowest (0.05 hect.) in the first group and highest 0.81 hectare in the fourth group. (Table 6.2)

(b) Reasons

In Chhatarpur the entire area of 10.71 hectares of fallow land was shared by 18 farmers. When enquired about the reasons for the fallow land 16 farmers i.e. 88.89 per cent reported that they had kept the area for grazing the cattle. Dispute over land was put forth as the reason by 2 farmers (11.11 per cent).

Table 6.2 Fallow Land on the Selected Farms

Size Group (Hectare)	CHHATARPUR					MANDLA				
	No.of Farms	Operated total Area	Fallow Land			No.of Farms	Operated Total Area	Fallow Land		
			Area (Hect.)	Average fallow land	Percengage to total operated Area			Area (Hect.)	Average fallow land	Percentage to total operated Area
Below 1 Hect.	18	14.75	Nil	-	-	28	13.87	1.47	0.05	10.59
1 - 2 "	27	34.33	0.20	0.01	0.58	28	37.80	6.62	0.23	17.51
2 - 4 "	30	68.30	0.90	0.03	1.32	24	67.19	3.59	0.15	5.34
4 - 8 "	18	89.32	6.37	0.35	7.13	12	60.57	9.70	0.81	16.01
8 and above	7	67.53	3.24	0.46	4.79	8	70.37	1.61	0.21	2.28
All Farms	100	274.23	10.71	0.11	3.91	100	249.80	22.99	0.23	9.20

The position in Mandla was some-what serious where the fallow land was more wide-spread as 22.99 hects. of fallow land were distributed on 23 farms.

Reason of fallow was attributed to poor soil by 17 farmers (73.91 per cent) who shared 78.00 per cent of total fallow area.

The other reasons given for the fallow were: weed infestation (affecting 3.30 per cent of total fallow area), grazing 0.87 per cent and insecurity on account of the closeness to forest was attributed for 6.18 per cent of total fallow area. Dispute of the land caused 11.65 per cent of the area to be kept fallow (Table 6.3).

Table 6.3 Fallow land on selected farms on Account of Different Reasons

Reasons	CHHATARPUR				MANDLA			
	No.of farmers		Fallow Area		No.of farmers		Fallow Area	
	No.	%	Area	%	No.	%	Area	%
1. Poor Soil	-	-	-	-	17	73.91	17.93	78.00
2.Meeds Land inpronements	-	-	-	-	-	-	-	-
3.Weed Infested	-	-	-	-	1	4.35	0.76	3.30
4.Grazing	16	88.89	7.17	66.95	1	4.35	0.20	0.87
5.Lack of Resoures	-	-	-	-	-	-	-	-
6.Close to Forest	-	-	-	-	1	4.35	1.42	6.18
7.Dispute over land	2	11.11	3.54	33.05	3	13.04	2.68	11.65
Total	18	100.00	10.71	100.00	23	100.00	22.99	100.00

(c) Remedial Measoures

After the identification of the reasons for keeping the land fallow, the farmers' opinion on its remedial measures was also taken.

Only two categories of remedial measures were suggested. The first category of measures included requirement of Govt. aid in reclamation and land improvement and development of irrigation facilities. Only 15 out of 41 farmers (i.e.36.59 per cent) having fallow land in both the samples of Chhatarpur and Mandla opined in favour of this measure.

Another 18 farmers (43.90 per cent) supported the present utilisation of fallow land as pasture for grazing of cattle. However, they favoured the development and proper management in the form of pasture land but expressed their inability to implement it on account of in security from stray cattle and the financial implication involved.

Remaining 8 farmers (19.51 per cent) offered no suggestion in this regard.

6.3 Seasonal Fallow

Now to the next category of fallow land which has been termed as 'seasonal fallow' it may be recalled that 85 per cent of the total cultivated area in this State is mono-cropped with the result that 28.15 per cent of net area sown remains fallow during kharif and 57.46 per cent during rabi.

(a) Extent

The position on the sample farms revealed that the percentage of seasonal fallow in kharif to the net area sown was 41.25 in Chhatarpur belonging to jowar-wheat crop zone

and 20 25 per cent in Mandla (from rice crop zone). (Tables6.4 and 6.5)

In rabi season the proportion of seasonal fallow was 24.97 per cent in Chhatarpur and 44.34 per cent in Mandla (Tables 6.4 and 6.5)

In Chhatarpur the break-up of net area sown for kharif showed that 58.74 per cent area was sown during kharif and the remaining 41.26 per cent was kept fallow. During rabi 4.79 per cent area remained under standing kharif crops, 70.24 per cent area was sown during rabi and the remaining 24.97 per cent area was kept fallow. Thus only 28.96 per cent area was double cropped (Table 6.4).

The position in Mandla revealed that during Kharif 1.11 per cent area remained under previous standing rabi crops, 78.64 per cent area was sown during kharif and 20.25 per cent area remained fallow (seasonal fallow kharif) In rabi 0.22 per cent area was occupied by perennial kharif crop, 55.44 per cent area was sown under rabi crops and the remaining 44.34 per cent area remained seasonal(rabi) fallow.

Thus 34.08 per cent of the area was double cropped. (Table 6.5)

(b) Reasons for Seasonal Fallow

The reasons for keeping land as seasonal fallow were studied for the two seasons i.e. kharif and rabi separately.

Table 6.4 Distribution of Net Area Sown in Kharif and Rabi, on Sample Farms in District Chhatarpur

(Area in Hectares)

KHARIF \ RABI	Standing Crop (Sown in previous season)	Area Sown in Rabi	Seasonal Fallow Rabi	TOTAL
Standing Crop (Sown in previous Season)	-	-	-	-
Area Sown in Kharif	12.64	76.33 (28.96 %)	65.82	154.79 (58.74 %)
Seasonal Fallow Kharif	-	108.73	-	108.73 (41.26 %)
TOTAL	12.64 (4.79 %)	185.06 (70.24 %)	65.82 (24.97 %)	263.52 (100.00 %) Net Area Sown

Table 6.5 Distribution of Net Area Sown in Kharif and Rabi, on Sample Farms in District Mandla

(Area in Hectares)

KHARIF \ RABI	Standing Crop (Sown in previous season)	Area Sown in Rabi	Seasonal Fallow Rabi	TOTAL
Standing Crop (Sown in previous Season) 6	-	2.52	-	2.52 (1.11 %)
Area Sown in Kharif	0.51	77.29 (34.08 %)	100.56	178.36 (78.64 %)
Seasonal Fallow Kharif	-	45.93	-	45.93 (20.25 %)
TOTAL	0.51 (0.22 %)	125.74 (55.44 %)	100.56 (44.34 %)	226.81 (100.00 %) Net Area Sown

(i) Kharif Fallow

In Chhatarpur the farmers keeping kharif fallow were 65 out of the total sample of 100 farmers. Fifty two farmers (i.e. 80 per cent of the farmers keeping kharif fallow) kept some kharif fallow in order to conserve moisture and prepare land for rabi crops. The area (91.97 hectares) kept fallow on account of this reason formed 84.59 per cent of total fallow in kharif.

The other reasons given by the sample farmers were : (i) Water logging in low lying land by 9.23 per cent farmers, (ii) erratic rainfall - delayed on set of rains by 7.69 per cent farmers and (iii) lack of resources (3.08 per cent farmers). Total area of fallow on account of these reasons was 16.76 hectares which formed 15.41 per cent of total kharif fallow (Table 6.6)

Table 6.6 Reasons for keeping kharif seasonal fallow on selected farms, Chhatarpur district.

Reasons for keeping Seasonal Fallow	Kharif			
	No. of Farmers keeping seasonal fallow		Seasonal Fallow Area	
	No.	%	Area (Hect.)	%
1. Erratic rainfall delayed on set of rains	5	7.69	5.75	5.29
2. Low lying water logged land	6	9.23	9.19	8.45
3. Lack of resources	2	3.08	1.82	1.67
4. To conserve moisture and prepare land for Rabi crops	52	80.00	91.97	84.59
Total	65	100.00	108.73	100.00

In Mandla 19 out of 28 farmer (i.e. 67.28 per cent) kept kharif fallow in order to conserve moisture and prepare land for rabi crops. This fallow area formed 69.72 per cent of total kharif fallow on sample farms.

The other reasons given for this practice were:- (i) lack of resources (14.29 per cent),(ii) Water-logging in the fields (10.71 per cent) and erratic rainfall / continuous rainfall at the sowing time (7.14 per cent). Total area kept fallow on account of these reasons formed 30.28 per cent of total fallow area on sample farms. (Table 6.7)

Table 6.7 Reasons for keeping kharif seasonal fallow on selected farms, Mandla district

Reasons for keeping Seasonal Fallow	Kharif			
	No. of Farmers keeping seasonal fallow		Seasonal Fallow Area	
	NO.	%	Area (Hect.)	%
1. Erratic rainfall- continuous rain at the sowing time	2	7.14	2.98	6.49
2. Waterlogging	3	10.71	4.04	8.79
3. Lack of resources	4	14.29	6.89	15.00
4. To conserve moisture and prepare land for rabi crop	19	67.86	32.02	69.72
Total	28	100.00	45.93	100.00

(ii) Rabi Fallow

The main reason for keeping seasonal fallow in rabi emerged to be the lack of water supply or unirrigated area. In Chhatarpur 51.35 per cent and in Mandla 57.58 per cent of the farmers keeping rabi fallow ascribed this reason for the fallow area in rabi. Total area kept fallow on account of this factor formed 52.06 per cent in Chhatarpur and 57.54 per cent in Mandla - of total rabi fallow in respective districts.

The other reasons for keeping rabi fallow in Chhatarpur - arranged in order of their importance were - risk and uncertainty (24.32 per cent), lack of moisture at the sowing time (16.22 per cent) and lack of resources with the farmer (8.11 per cent). Total land kept fallow on account of these reasons formed 47.97 per cent of total fallow area on sample farms. Their break up is given in Table 6.8.

Table 6.8 Reasons for keeping rabi fallow on selected farms, in Chhatarpur district.

Reasons for keeping Seasonal Fallow	Rabi Fallow			
	No.of Farmers keeping seasonal fallow		Seasonal Fallow Area	
	No.	%	Area(Hect.)	%
1. Lack of moisture in the soil at the sowing time	6	16.22	10.50	15.95
2. Lack of water supply (irrigation)	19	51.35	34.26	52.06
3. Lack of resourdes	3	8.11	2.12	3.23
4. Risk and uncertainty	9	24.32	18.94	28.76
Total	37	100.00	65.82	100.00

In Mandla the reasons - other than lack of water supply or irrigation discussed above - were (i) lack of moisture in the soil at the sowing time (15.15 per cent), (ii) risk and uncertainty (13-64 per cent), (iii) lack of resources (7.57 per cent). One more reason given by 4 farmers (6.06 per cent) was related to soil i.e. cracking of the soil. The area kept fallow on account of this reason was 10.13 per cent of total rabi fallow. Area kept fallow on account of risk and uncertainty was 28.76 per cent and on account of lack of moisture at the sowing time was 15.95 per cent of total rabi fallow. (Table 6.9)

Table 6.9 Reasons for keeping rabi seasonal fallow, on selected farms, in Mandla district

Reasons for keeping Seasonal Fallow	Rabi Fallow			
	No. of Farmers keeping seasonal fallow		Seasonal Fallow Area	
	No.	%	Area (Hect.)	%
1. Lack of moisture in the soil at the sowing time	10	15.15	12.38	12.31
2. Soil cracking	4	6.06	10.19	10.13
3. Lack of Irrigation	38	57.58	57.85	57.54
4. Lack of resources	5	7.57	8.50	8.45
5. Risk and uncertainty of failure of crop	9	13.64	11.64	11.57
Total	66	100.00	100.56	100.00

(c) Relation of Crops and Seasonal Fallow

Examining the relation-ship of different crops grown on the sample farms with the area of seasonal fallow preceding or following those crops it was observed that :

1. Among the kharif crops grown - Jowar in Chhatarpur and Paddy in Mandla were followed by rabi fallow to the extent of 93.80 per cent and 54.72 per cent of their areas respectively. In Chhatarpur 46.41 per cent of total rabi fallow was preceded by kharif Jowar (single or mixed crop). In Mandla 69.95 per cent of total rabi fallow was preceded by rice crop.

2. In Chhatarpur paddy crop preceded 8.01 per cent of the rabi fallow and the proportion of paddy area kept fallow in rabi was 30.29 per cent.

3. In both the districts common minor millet crops (Kodon, Kutki, Sawa) and Basara (grown in Chhatarpur) preceded 21.88 per cent of rabi fallow in Chhatarpur and 13.81 per cent of rabi fallow in Mandla. The per-centage of their own area kept fallow in rabi was 34.45 in Chhatarpur and 63.45 in Mandla.

4. In Mandla the area of niger (Ramtil) crop was kept fallow during rabi to the extent of 62.01 per cent. The share of this fallow area in total rabi fallow was 9.94 per cent.

5. In Chhatarpur sesamum (Til) area was kept fallow to the extent of 52.75 per cent. It formed 10.62 per cent of total rabi fallow (Table 6.10)

Similar relationship of rabi crops and the preceding kharif fallow as observed on sample farms was as discussed below. (Refer table 6.11)

Highest proportion of kharif fallow i.e. 81.23 per cent in Mandla and 56.04 per cent in Chhatarpur preceded the wheat crop. The percentage of this fallow area to total wheat area

Table 6.10 Major Kharif Crops Followed by Rabi Fallow

CHHATARPUR					MANDLA				
Crop (Kharif)		Fallow (Rabi)			Crop (Kharif)		Fallow (Rabi)		
Name of the Crop	Area	Area	% to total Rabi Fallow	% to Kharif crop	Name of the crop	Area	Area	% to total Rabi Fallow	% to Kharif Crop
1. Jowar + Moorg	22.65	22.65	34.41		1. Paddy	129.21	70.70	69.95	54.72
Jowar	9.11	7.09	10.77		2. Minor Millets				
Jowar + Kodon	0.81	0.81	1.23		Kodon	14.43	9.07	8.97	
	32.57	30.55	46.41	93.80	Kutki	4.95	3.55	3.51	
2. Minor Millets					Kodon + Kutki	2.31	1.10	1.09	
Basara	22.65	0.62	0.94		Sawa	0.24	0.24	0.24	
Kodon	9.41	7.80	11.85			21.93	13.96	13.81	63.65
Sawa	8.02	4.56	6.93		3. Niger(Ramtil)	13.43	7.70	7.62	
Kodon Moong	0.81	0.81	1.23			2.76	2.34	2.32	
Kutki	0.61	0.61	0.93			16.19	10.04	9.94	62.01
	41.50	14.40	21.88	34.45	4. Other crops	11.03	5.86	6.30	53.12
3. Til	13.25	6.99	10.62	52.75					
4. Paddy	17.40	5.27	8.01	30.29					
5. Other Crops	50.07	8.70	13.08	17.36					
All Kharif Crops	154.79	65.82	100.00	42.52	All Kharif Crops	178.36	100.56	100.00	56.38

Table 6.11 Major Rabi Crops Preceded by Kharif Fallow

CHHATARPUR					MANDLA				
Crops (Rabi)		Fallow Kharif			Crops(Rabi)		Fallow Kharif		
Crop	Area	Area	% to total Kharif Fallow	% to Rabi Crop	Crop	Area	Area	% to total Kharif Fallow	% to Rabi Crop
1. Wheat	112.14	60.94	56.05	54.34	1. Wheat	88.95	37.31	81.23	41.94
2. Barley	28.10	10.03	9.22	35.69	2. Gram	4.75	2.23	4.85	46.94
3. Gram	30.66	24.61	22.63	80.28	3. Pea	8.00	1.58	3.44	
4. Mixed Crops					4. Linseed	8.54	2.04	4.44	
(Wheat, Barley	2.43	2.43			5. Mixed Crops				
Gram)	1.62	1.62			Wheat, Gram	1.11	0.61		
	1.01	-			Gram Linseed	0.51	0.51		
	0.81	-				1.62	1.12	2.43	
	4.87	4.05	3.72	83.16					
Other Crops	9.29	9.10	8.38	97.95	Other crops	13.88	1.65	3.61	
All Crops	185.06	108.73	100.00	58.75	All Crops	125.74	45.93	100.00	

was 54.34 in Chhatarpur and 41.94 in Mandla.

Gram was the seccnd important rabi crop in this regard in both the districts. In Chhatarpur 22.63 per cent and in Mandla 4.85 per cent of kharif fallow was utilised for sowing gram in the rabi season. (Table 6.11)

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CHAPTER VII

UTILISATION - PROBLEMS AND PROSPECTS

7.1 Farmers' Views

Having examined the extent of fallow land of different categories, the possibilities of their utilisation need now to be explored. In the previous chapter the remedial measures for fallow land proposed by the farmers were discussed. Only two categories of remedial measures were suggested :

1. Government aided programme for reclamation or land improvement and development of irrigation facilities. Thirty six per cent of the farmers having fallow land opined in its favour.

   This measure may be practicable in the cases where considerable area of fallow land exists as one piece, but in most of the cases where the fallow land exists in small fragments only the cultivators' individual efforts (may be backed by Government subsidy) would be fruitful. However, the idea behind this suggestion is very clear, that, under the present situation the fallow land had little utility for crop production.

2. Utilisation of fallow land as pasture or grazing ground - forty four per cent of the farmers supported this view. It is in actual practice also, though proper management and scientific techniques are lacking. No other, alternative use of the fallow land was proposed by the farmers.

7.2 Expert Opinion

Expert opinion on the problem of fallow land in this State collected through an opinion questionnaire mailed to various officials connected with research, extension and administration in the Department of Agriculture and the Agricultural University would clarify the situation better. In all 67 opinion questionnaires were mailed out of which 19 replies (28 per cent) were received.

7.2.1 Alternative Use

With regard to the possibilities of utilising fallow land (current and old fallow) there was a question in the opinion questionnaire - 'Is there any alternative use possible ?

The alternatives suggested in the replies may be classified into following four categories:

1. Utilisation of these land for horticultural purpose i.e. growing of fruit trees was suggested by 10 respondents (52.63 per cent)

2. Utilisation in the form of pasture for grazing of cattle was favoured in 8 replies (42.11 per cent).

3. Social forestory/Agro-forestry was proposed by 6 (31.58 per cent).

4. Utilisation of fallow land for growing of crops was also opined with two different sets of conditions

   (a) Cultivation after providing irrigation facility and land improvement was proposed in 5 replies (26.32 per cent).

(b) Growing short duration varieties of crops particularly during kharif and making suitable alterations in the cropping pattern to accomodate some rabi crop. This view got favour of 3 respondents(15.79 per cent).

The total of the above percentages exceeds one hundred because most of the replies were in favour of more than one alternative use.

7.2.2 Possibility of Double Cropping

On to the problem of seasonal fallow-which is in greater dimensions than current and other fallow in this State - some specific questions were included in the questionnaire to draw opinion regarding possibilities of their minimisation. The first questions was, what are the possibilities of double cropping ?

From the replies to the above question the possibilities and the ways suggested for double cropping were tabulated and categorised as given below:

1. No alternative use possible - Forty two per cent (8 replies) denied any possibility of double cropping in the present situation.

2. Possibility of double cropping agreed and certain changes in cropping suggested - 10 (52 per cent)

   (a) Growing of suitable short duration varieties - 10

   (b) Inter-cropping and mixed cropping - 3

   (c) Adoption of new crop rotations - 5

3. In one reply respondent agreed to the possibility of double cropping but no suggestion was given (5.26 per cent)

Another question concerning this problem was 'Is it not possible to grow a second crop during rabi ?'

The replies to this question have been grouped in three categories :

1. Not possible - 8 (42 per cent)
2. Possible to limited extent - 4 (21 Per cent)
3. Possible if following steps are taken :

(a)	Irrigation is provided	4	= (37 per cent)
(b)	Stray cattle are controlled	2	
(c)	Drainage is improved	1	

7.3 Future Prospects

7.3.1 Utilisation of Fallow

From the foregoing discussion it is quite clear that in Madhya Pradesh the scope of bringing fallow land under cultivation is quite limited. The 'Action Plan for 1981-82' prepared in the 'Productivity Seminar held by the Department of Agriculture Madhya Pradesh expressed that 'as regards the increasing of cropped area by bringing new and old fallows under cultivation the scope seems to be very limited.' The programme for the year 1982-83 suggested in the Plan was - to bring 5 per cent of fallow land under cultivation and another 5 per cent to be utilised for social forestry and horticulture*.

For proper utilisation and management of fallow land it is necessary that land-use planning should be done i.e. 'a balance between agriculture, forestry and pastures must be

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* 'Productivity Seminar Action Plan For 1982-83' Department of Agriculture M.P. Bhopal.

kept in view so that the twin objectives of maximizing current production and of conseving land and water resources might be fulfilled simultaneously*'.

The idea of extension of cultivation on the cultivable waste and fallow land should reconcile to the other requirements of land also. The pattern of agriculture i.e. its coverage and intensification should be decided in accordance with the landscape, topography, soil, climate and water supply.

7.3.2 Double Cropping

The possibilities of utilising seasonal fallow for double cropping are some what better. The 'Action Plan' (quoted above) mentioned that 'we can very well think of using fallows both kharif and rabi for raising crops by adopting dryfarming practices,**.The problems of dry-land farming have been engaging the attention of our farm scientist... while further research is clearly needed, even more urgent is the task of toning up the working of farm extension agencies so as to facilitate the speedy dissemination of the results from the laboratory to the farm level ***,

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* 'Studies in utilisation of Agricultural land', D.S.Chauhan p.196.

The author has given three principles of land-use planning viz:

1. Principle of Multiple Use
2. Principle of Optimum Use
3. Principle of Maximum Production

** 'Productivity Seminar Action Plan for 1982-83'Department of Agriculture M.P. Bhopal.

*** 'Need to Boost Dryland Farming Potential,' S.Gangadharan, The Economic Times, March 14, 1984.

Thus, the seasonal fallow land can be utilised for double cropping provided the dry farming practices and water harvesting technology are adopted. A complementary measure to this would be adoption of short duration varieties and suitable changes in cropping pattern.

7.3.3 Expansion of Irrigation

Expansion of irrigation can provide wide apportunities of not only increasing intensity of land use but intensity of cropping also. The irrigation potential of the State was estimated to 24 million acres (97.10 lakh hectares) by NCAER* and 99.3 lakh hectares by the Central Water Commission+ though the net irrigated area was only 21.39 lakh hectares in 1979.80. It indicates that there is ample scope of expansion of irrigation in this State and considerable agricultural development of this State is lying dormant under the unexploited irrigation potential.

7.7 Measures Suggested

Thus for proper utilisation and management of all available arable land including fallow it is necessary that well planned schemes of regional land use, crop planning with scientific crop rotations should be prepared and implemented. Implementation of such schemes should be backed by strong legal measures, adequate financial support and well organised extension programme.

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* 'Techno-Economic Survey of Madhya Pradesh'. National Council of Applied Economic Research, 1960. p.165.

\+ 'Annual Plan 1978-79, Department of Irrigation Madhya Pradesh (Mimeographed).

Since agricultural land is a scarce factor of production and its scarcity is increasing day by day the proper utilisation of land should be made obligatory on the part of its users*. All types of financial assistance - may be government subsidy or agricultural loan from Cooperative or Commercial banks should be given to those farmers only who adopt the recommended plan and practices of cropping.

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* Realising the dangerous consequences of unplanned expansion of agriculture and exploitation of land the First Five Year Plan had recommended that farmers should conform to the standards of efficiency in the cultivation and management of land. It was realised that all farmers should be obliged to maintain reasonable standards of production and to preserve and develop the fertility of soil. In this context the Committee of the Panel on land Reforms had recommended that 'there should be land management legislation to provide necessary incentives and sanctions for the performance of this obligation. 'The main purpose of land management legislation by itself is to instil a sort of fear in the minds of farmers for punitive action in the case of their failure to adopt improved management practices.*' Some of the States have acquired powers under which they can ask the owners of the waste and fallow lands to bring them under cultivation. In default there of, the government has the right to lease them out to tenants for a number of years. Assam and Madhya Pradesh have increased assessment on waste lands so as to induce the owners to put such lands under the plough ..... In Bombay State (prior to the reorganisation of States of Maharashtra and Gujarat) if a land is improperly cultivated or is lying uncultivated for any two seasons, whatever the reasons, the government can assume management immediately.+

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* 'Economic Problems of Indian Agriculture' By G.D.Agrawal and P.C. Bansil. Vikas Publications (1969) p.103.

+ Ibid p.103-104

To enforce such schemes of land use and crop planning all round efforts would be required. It should not be enforced hurriedly in the wake of any political slogan or the election manifesto rather the plans should be prepared after extensive research and survey of the regions in respect to its topography, soil, climate, agro-economic and socio economic problems.

To enforce such a scheme in the right earnest the administrative and extension machinery should be properly geared. Proper coordination among the departments and institutions related with the agricultural land, irrigation, supply of inputs, agricultural finance, and marketing should be maintained.

The need of trained workers and officials should not be underestimated. Looking to this need the recruitment policy, in all departments related with agricultural land, water, inputs and marketing i.e. Land Revenue, Irrigation, Agriculture, Agricultural finance marketing, cooperation and panchayats should be changed. Only agricultural graduates, agricultural engineers, and workers trained in these disciplines should be appointed in the above mentioned departments.

Contd.....

The results of these legal measures with regard to proper management of land were almost nil.'Both the pace and content of these measures have been affected by social and political pressures and counter pressures. Gaps are left and the laws by their own inherent weakness quite apart from administrative difficulties fail to serve the objectives fully.* Farmer's interest remained confined to his ownership right on the land and whatever interest he took in improving his farming standard was due to other factors and not due to any fear of land management legislation.

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* Ibid p.104.

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CHAPTER VIII

SUMMARY AND CONCLUSIONS

By and large, land constitutes the most important factor of production in agriculture. An ever increasing demand for agricultural products accentuates the scarcity of land. The population pressure on land is increasing and the cultivable land is limited. This necessitates full use of all available cultivable land.

The total potential of culturable land in the country is only 182.39 million hectares i.e. 59.82 per cent of the geographical area. Again about 75 per cent of the net area sown being monocropped vast area of land remains as seasonal fallow during kharif or rabi seasons. However, in view of the high degree of dependence on agricultural land and lower productivity the proper and intensive utilisation of the available cultivable land in the country assumes a great importance.

Looking to the situation a study of fallow land in Madhya Pradesh was taken up by AER.Centre Jabalpur, at the initiation of the Directorate of Economics and Statistics, Ministry of Agriculture, Government of India. The main objectives of the Study were :

1. To study the extent of fallow land in Madhya Pradesh, its nature and spread
2. To study the reasons behind the non-utilising of this land for raising crops
3. To study the possibilities of utilising the fallow land for raising crops under the new technology

To study the problem in the State, two districts - Chhatarpur and Mandla - were selected from two different crop zones - rice zone and jowar-wheat zone where the proportion of 'fallow land' was quite high. The selection of the districts

(One district from each selected crop zone) was also done on the basis of high proportion of fallow land to total cultivable land in the district. In each selected district two tahsils and in each tahsil two villages were selected on the advice of the local officials.

From each selected village a sample of 25 farmers was selected by random method. Thus the total sample comprised 200 farmers. The reference year was 1981-82.

Madhya Pradesh is primarily an agricultural State. Being the largest state in area and cultivated area the cropping intensity of 112 per cent indicates the extensive use of land. The land utilization statistics of the state reveals that about 1.75 million hectares (3.96 per cent) of land remains fallow (categorised as current and old fallow) and most of the area in the State being mono-cropped considerable area remains as seasonal fallow.

Fallow is that category of cultivated land which is kept vacant i.e. unsown for one cropping year or more. In the land use classification 'fallow land is divided under two heads 'current fallow' and 'other fallow'. Fallow land other than current fallow includes all the land which was taken up for cultivation but is temporarily out of cultivation for a period of not less than one year and not more than five years. Current fallow comprises area which is kept fallow during the current year. The term current fallow is used for the area which is not under crops at the time of reporting, but was sown in the previous years. Seasonal Fallow is that part of the net area sown which remains unsown during any crop season of the agricultural year. If that area remains unsown (vacant) during kharif season it is called 'kharif fallow'

and similar unsown or vacant area of rabi is called ' rabi fallow'.

Out of the total 22.86 million hectares (7.50 per cent) of fallow land in the country, Madhya Pradesh shared 1.76 million hectares i.e. 7.68 per cent. Its proportion in the total area of the State was 3.96 per cent.

On the basis of the percentage of area under fallow to total reporting area of the State, Madhya Pradesh stood eleventh having 3.96 per cent area under fallow. The proportion of fallow land in Madhya Pradesh is not very high in relative terms, though absolute area of fallow land in the State is considerable i.e. 1,756 thousand hectares. It is 7.68 per cent of total fallow land in the country.

The absolute area of fallow land was highest in rice zone (924 thousand hectares) sharing 48.13 per cent of total fallow area in the State. Jowar-wheat zone stood second with 432 thousand hectares of fallow area, sharing 22.53 per cent. The proportion of fallow area to the total geographical area (reported area) was highest in rice-wheat crop zone (7.85 per cent) followed by jowar-wheat zone (5.40 per cent) and then rice zone having 5.09 per cent area under fallow.

The proportion of fallow land to total cultivated area was highest in Mandla district (26.32 per cent) and lowest in Indore (1.29 per cent). Eighteen districts had higher proportion of fallow land than the state proportion of 9.43 per cent. The highest acreage of 'old fallow' was in Shahdol district (77.8 thousand hectares i.e. 13.18 per cent of total cultivated area in the district) followed by Mandla

(77.1 thousand hectares which was 13.92 per cent). Other important districts following Shahdol and Mandla, were Sarguja, Bastar and Chhatarpur. With regards to 'current fallow' Mandla stood first with 68.7 thousand hectares (12.40 per cent of total cultivated land) followed by Shahdol, Sarguja, Chhindwara and Chhatarpur.

Barring a few districts of the south east, entire State of Madhya Pradesh comes under Semi Arid Tropical region. Nearly 87 per cent of the total cultivated area in the State is dependent entirely on monsoon and therefore about 85 per cent of the net area sown in the state is monocropped.

The percentage of seasonal fallow during kharif was 28.15 per cent of net area sown while the percentage of seasonal fallow during rabi was 57.46 per cent. The proportion of kharif fallow was highest in wheat crop zone (69.47 per cent) and lowest in rice zone (8.15 per cent). The situation of rabi fallow was just reverse. It was lowest in wheat zone (26.66 per cent) and highest in cotton-jowar zone (72.31 per cent). Rabi fallow was equally high in the rice zone (72.20 per cent of the net area sown). Highest proportion of kharif fallow was in Raisen district (82.00 per cent of net area sown) followed by Vidisha(78.61 per cent) and Sagar (72.44 per cent). All these districts belonged to wheat crop zone of the State. Highest percentage of Rabi fallow was in Bastar (94.89 per cent) followed by Raigarh (94 per cent) and Khargone (92.68 per cent). The first two belonged to the rice zone and the third to cotton-jowar zone.

On the sample farms the average size of owned land was 3.00 hectares in Chhatarpur and 2.58 hectares in Mandla. The proportion of unculturable land in the total owned land was 11.05 per cent in Chhatarpur and 5.48 per cent in Mandla. The proportion of fallow land varied from nil to 6.44 per cent in Chhatarpur while in Mandla it ranged between 2.12 per cent and 16.99 per cent in different size groups.

Land use intensity on sample farms of Chhatarpur was 96.09 per cent and in Mandla 90.80 per cent. In Chhatarpur land use intensity was higher on small farms than on large farms. In Mandla there was no definite relationship.

The gross acre intensity in Chhatarpur was highest in the holding size group of 4-8 hectares (130.46 per cent) and lowest on farms of less than one hectare (124.67 per cent) while in Mandla it was highest in the holding size group of 2-4 hectares (139.81 per cent) and lowest, in the size group of 1-2 hectares (121.62 per cent).

The season acre intensity on sample farms was 133.76 per cent in Chhatarpur and 135.41 per cent in Mandla. The difference between season acre intensity and cropping intensity in Chhatarpur was 4.80 and in Mandla 1.34 indicating that perennial crops were more common in Chhatarpur than Mandla.

In Chhatarpur 65 per cent of the sample farmers had irrigation facilities mostly wells. The proportion of irrigated area on the farms was 42.55 per cent. In Mandla only seven per cent of the sample farms had irrigation and

irrigated area formed 7.47 per cent of total operated area. The percentage of irrigated area on farms having irrigation facilities was 49.98 per cent in Chhatarpur and 50.67 per cent in Mandla.

In Chhatarpur rabi crops dominated by occupying 54.45 per cent of gross cropped area as compared to kharif crops which occupied 45.55 per cent area. The situation in Mandla was reverse where kharif crops occupied 58.65 per cent area as compared to rabi crops which were grown on only 41.35 per cent of gross cropped area. In Chhatarpur the dominating crops were wheat, gram and barley. Mixed crops occupied important position in the cropping pattern in this district. In Mandla the most dominating crop was rice (42.49 per cent) followed by wheat (29.25 per cent). Mixed crops were not so important in Mandla as were in Chhatarpur.

In Chhatarpur the average fallow land increased with the size group. While in the lowest size group there was no fallow land, it was 0.01 hectares in the second group and 0.46 hectares in the largest size group. In Mandla no such tendency was visible. It was lowest (0.05 hectare) in the first group and highest 0.81 hectare in the fourth group.

In Chhatarpur the entire area of 10.71 hectares of fallow land was shared by 18 farmers. Sixteen farmers i.e. 88.89 per cent had kept the area for grazing the cattle. The position in Mandla was some what serious where the fallow land was more wide spread as 22.99 hectares of fallow land was distributed on 23 farms. Reason of fallow

was attributed to poor soil by 17 farmers (73.91 per cent) who shared 78.00 per cent of total fallow area. The other reasons given for the fallow were: weed infestation (affecting 3.30 per cent of total fallow area) grazing 0.87 per cent and insecurity on account of the closeness to forest was attributed for 6.18 per cent of total fallow area. Dispute of the land caused 11.65 per cent of the area to be kept fallow.

Only two categories of remidial measures were suggested. The first category of measures included requirement of Government aid in reclamation and land improvement and development of irrigation facilities. Only 15 out of 41 farmers (i.e.36.59 per cent) having fallow land in both the samples of Chhatarpur and Mandla opined in favour of this measure.

Another 18 farmers (43.90 per cent) supported the present utilisation of fallow land as pasture for grazing of cattle. Remaining 8 farmers (19.51 per cent) offered no suggestion in this regard.

The percentage of seasonal fallow in kharif to the net area sown was 41.25 in Chhatarpur belonging to jowar-wheat crop zone and 20.25 per cent in Mandla (from rice crop zone). In rabi season the proportion of seasonal fallow was 24.97 per cent in Chhatarpur and 44.34 per cent in Mandla.

In Chhatarpur the break-up of net area sown for kharif showed that 58.74 per cent area was sown during kharif and the remaining 41.26 per cent was kept-fallow. During rabi 4.79 per cent area remained under standing kharif crops,

70.24 per cent area was sown during rabi and the remaining 24.97 per cent area was kept fallow. Thus only 28.96 per cent area was double cropped.

The position in Mandla revealed that during kharif 1.11 per cent area remained under previous standing rabi crops, 78.64 per cent area was sown during kharif and 20.25 per cent area remained fallow (seasonal fallow kharif). In rabi 0.22 per cent area was occupied by perennial Kharif crops, 55.44 per cent area was sown under rabi crops and the remaining 44.34 per cent area remained seasonal (rabi) fallow. Thus 34.08 per cent of the area was doubled cropped.

In Chhatarpur the farmers keeping kharif fallow were 65. Fifty two farmers kept kharif fallow in order to conserve moisture and prepare land for rabi crops. The area kept fallow on account of this reason formed 84.59 per cent of total fallow in kharif.

The other reasons given, were : (i) Water logging in low lying land (by 9.23 per cent farmers) (ii) Erratic rainfall - delayed on set of rains (by 7.69 per cent farmers) and (iii) lack of resources (3.08 per cent farmers). Total area of fallow on account of these reasons was 16.76 hectares which formed 15.41 per cent of total kharif fallow.

In Mandla 19 out of 28 farmers (i.e. 67.28 per cent)kept kharif fallow in order to conserve moisture and prepare land for rabi crops. This area formed 69.72 per cent of total kharif fallow on sample farms. The other reasons given were - (i) lack of resources(14.29 per cent), (ii) water logging in the fields (10.71 per cent) and

Among the kharif crops grown-jowar in Chhatarpur and paddy in Mandla were followed by rabi fallow to the extent of 93.80 per cent and 54.72 per cent of their areas respectively. In Chhatarpur 46.41 per cent of total rabi fallow was preceded by kharif jowar (single or mixed crop). In Mandla 69.95 per cent of total rabi fallow was preceded by rice crop. Minor millets preceded 21.88 per cent of rabi fallow in Chhatarpur and 13.81 per cent of rabi fallow in Mandla. In Mandla the area of niger (Ramtil)crop was left fallow during rabi to the extent of 62.01 per cent. In Chhatarpur sesamum (til) area was kept fallow to the extent of 52.75 per cent.

Highest proportion of kharif fallow i.e. 81.23 per cent in Mandla and 56.04 per cent in Chhatarpur preceded the wheat crop. The percentage of this fallow area to total wheat area was 54.34 in Chhatarpur and 41.94 in Mandla. In Chhatarpur 22.63 per cent and in Mandla 4.85 per cent of kharif fallow was utilised for growing gram in the rabi season.

The remedial measures for fallow land proposed by the farmers were of two categories :

1. Government aided programme for reclamation or land improvement and development of irrigation facilities. Thirty six per cent of the farmers having fallow land opined in its favour. This measure may be practicable in the cases where considerable area of fallow land exists as one piece, but in most of the cases where the fallow land exists in small fragments only the cultivators individual efforts (may be backed by Government subsidy) would

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be fruitful. However, the idea behind this suggestion is very clear, that, under the present situation the fallow land had little utility for crop production.

2. Utilisation of fallow land as pasture or grazing ground - forty four per cent of the farmers supported this view. It is in actual practice also though proper management and scientific techniques are lacking. No other, alternative use of the fallow land was proposed by the farmers.

Expert opinion on the problem of fallow land in this this state collected through an opinion questionnaire suggested the following alternatives :

1. Utilisation of these land for horticultural purpose (52.63 per cent).
2. Utilisation in the form of pasture for grazing of cattle (42.11 per cent).
3. Social forestry / Agro-Forestry (31.58 per cent)
4. Utilisation of fallow land for growing of crops was also opined with two different sets of conditions

(a) Cultivation after providing irrigation facility and land improvement (26.32 per cent).

(b) Growing short duration varieties of crops particularly during kharif and making suitable alterations in the cropping pattern to accomodate some rabi crop (15.79 per cent).

With regard to the possibility of double cropping forty two per cent denied any possibility in the present

situation. Others agreed with the possibility under certain conditions e.g.

(a) Growing of suitable short duration varieties

(b) Inter-cropping and mixed cropping

(c) Adoption of new crop rotations

Thus the scope of bringing fallow land under cultivation is quite limited in Madhya Pradesh. However for betterment of the situation following measures may be adopted. For proper utilisation and management of fallow land it is necessary that land use planning should be done. The idea of extension of cultivation on the cultivable waste and fallow land should reconcile to the other requirements of land also. The pattern of agriculture i.e. its coverage and intensification should be decided in accordance with the landscape, topography, soil, climate and water supply.

The seasonal fallow land can be utilised for double cropping provided the dry farming practices and water harvesting technology are adopted. A coplementary measure to this would be adoption of short duration varieties and suitable changes in cropping pattern.

Expansion of irrigation can provide wide apportunities of not only increasing intensity of land use but intensity of cropping also. There is ample scope of irrigation in this state and considerable agricultural development of this state is lying dormant under the unexploited irrigation potential. Thus for proper utilisation and management of all available arable land including

fallow it is necessary that well planned schemes of regional land use, crop planning with scientific crop rotations should be prepared and implemented. Implementation of such schemes should be backed by strong legal measures adequate financial support and well organised extension programme.

Proper utilisation of land should be made obligatory on the part of its users.

Schemes of land use and crop planning should not be hurriedly enforced in the wake of any political slogan or the election manifesto rather the plans should be prepared after extensive research and survey of the regions in respect to its topography, soil, climate, agro-economic and socio-economic problems.

Administrative and extension machinery should be properly geared. Proper coordination among the departments and institutions related with the agricultural land, irrigation, supply of inputs, agricultural finance, and marketing should be maintained.

The need of trained workers and officials should not be underestimated. Only agricultural graduates, agricultural engineers, and workers trained in these disciplines should be appointed in all departments related with agricultural land, water, inputs and marketing.

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