Study No. 101

Possibilities and Constraints in increasing Pulses Production in Madhya Pradesh and the Impact of NFSM on Pulses

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Possibilities and constraints in increasing pulses production in Madhya Pradesh and the impact of NFSM on pulses

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PREFACE

Pulses are the major source of dietary protein in the vegetarian's diet in our country. Besides being a rich source of protein, they maintain soil fertility through biological nitrogen fixation in the soil and play a vital role in furthering sustainable agriculture, looking to the importance of the pulses, Government of India, Ministry of Agriculture initiated many pulse development programmes like NPDP (National Pulse Development Programme), Technical Mission on Oilseeds and Pulses (TMOP), integrated scheme of oilseeds, pulses, oil palm & maize *(I*SOPOM*)* and National Food Security Mission on Pulses (NFSM-Pulses). Madhya Pradesh is a major pulse growing state of the country and gram, tur, urid, lentil, mung are the important pulses being cultivated by the farmers of the state for dietary as well as economic reasons.

The NFSM has been implemented in Madhya Pradesh in 2006 – 07 but effectively it was executed in 2007 – 08. The Ministry of Agriculture, GOI has initiated an evaluation project to know the effect of NFSM on pulse development and pulse productivity in the country and in the states as well.

We express our sincere thanks to Directorate of Economic and Statistics, Ministry of Agriculture, GOI for entrusted this evaluation study entitled *"**Possibilities and constraints in increasing pulses production in Madhya Pradesh and the impact of NFSM on pulses**"* to AER Centre, Jabalpur. I wish to place my gratitude to Dr. C. S. C. Shekhar, IEG, who is Coordinator of this study.

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INTRODUCTION

1.1 Brief introduction of the study

Pulses are the major source of dietary protein in the vegetarian diet in our country. Besides being a rich source of protein, they maintain soil fertility through biological nitrogen fixation in soil and thus play a vital role in furthering sustainable agriculture (Kannaiyan, 1999). At present globally 60 million tonnes of pulses are produced annually from 70 million hectares. The contribution of developing countries like India, China, Brazil, Turkey and Mexico accounts for nearly two third production India is the largest producer with 33 per cent of global area contributing 22 per cent of the world's production. Normally the area under pulses in the country is around 24.38 million hectares with a production of 14.52 million tonnes. The average productivity of the country is about 600 Kg/ha against the average global productivity of 857 Kg/ha. Thus pulses play an important role in food and national security and environmental sustainability. There may be possibility to increased production up to 857 Kg/ha.

Pulses in India have long been considered as the poor man's source of protein. The major pulse crops grown in India are chickpea, pigeon pea, lentil, moongbean, urdbean and field pea. About 90% of the global pigeon pea, 65% of chickpea and 37% of lentil area falls in India, corresponding to 93%, 68% and 32% of the global production, respectively (FAOSTAT 2009). Due to increased population and stagnant production, the net availability of pulses has come down from 60 gm/day/person (1951) to 31 gm/day/person (M.P.) as against the Indian Council of Medical Research recommends 65 gm/day/capita.

Pulses are a wonderful gift of nature as they nourish mankind with highly nutritive food and keep the soil alive and productive. On account of these virtues, pulse crops remained an integral part of the sustainable agriculture production systems of the semi-arid tropics. Pulses occupy 67.8 million hectares of area and contribute 55.2 million tones to the world's food basket. Chickpea dominates with over 40 per cent share followed by pigenopea with 20 per cent. In the developing world facing protein calorie malnutrition and under-nutrition, pulses continue to be the major source of dietary protein. On account of a balanced amino –acid composition of cereal and pulse protein blend, which matches with milk protein, the value of pulses in vegetarian diet cannot be over emphasized. Pulses are also rich source of minerals like calcium, phosphorus, iron, etc. and certain

vitamins. Despite this, pulses are considered secondary to cereal crops and relegated to marginal soils, as they are perceived to be low yielding and less remunerative crops. As a result of this, the growth rate of production of pulses in India, the major pulse growing country in the world is low compared to that of cereals. The slow growth in pulse production compared to enormous increase in human population led to progressive decline in availability of pulses from 70 gram/adult day in 1960-61 to less than 40 grams during the present decade. This has caused great concern among policy makers, administrators and researchers. The present study is an attempt to undertake the task of verifying the above issues. The specific objectives are to identify various factors influencing the supply of pulses and to develop suitable demand relations.

India, owing to its diverse agro climatic conditions, pulses is grown throughout the year. Pulses position in the cropping pattern of India is given table 1.1.

Table 1.1 Pulses position in the cropping pattern of India

S. No.	Periods	TE1952-53	TE1962-63	TE1972-73	TE1982-83	TE1992-93	TE2002-03	TE2007-08
1	Rice	22.50	22.44	22.72	22.81	22.96	23.75	22.89
2	Wheat	7.21	8.61	11.53	13.02	13.01	14.03	14.41
3	Other cereals	29.54	28.77	26.71	23.88	18.81	15.76	15.08
4	Total cereal	59.25	59.81	60.96	59.71	54.78	53.54	52.38
5	Total pulses	14.33	15.47	13.30	13.24	12.56	11.41	12.11
6	Total food grains	73.58	75.29	74.26	72.95	67.34	64.95	64.49
7	Total oilseeds	8.34	9.42	10.08	10.39	13.60	12.15	14.11
8	Cotton	4.67	5.01	4.68	4.55	4.09	4.60	4.75
9	Other crops	13.41	10.28	10.98	12.11	14.97	18.3	16.65
10	GCA	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Agricultural Statistics at a glance, 2009, Government of India, Ministry of Agriculture, India
Note: * TE – triennium ending

The share of the total pulses in the gross cropped area (GCA) was 14.33 percent during triennium ending (TE) 1952-53 and with fluctuations in between the years; it remained to around 12 percent during TE 2007 – 08. The contribution of food grains in the GCA has reduced significantly between these two periods, i.e. by 9 percent. This was mainly due to decline in the share of area under cereals (around 7%).

This table indicated that area and production of pulses increased between TE 1952-53 and TE 1962-63.but during the last four and half decades, i.e. between 1962-63 and 2007-08, pulses area has decreased by 3.95 percent as compared to 7.80 increases in the case of cereals.

Table 1.2: Area, production and yield of pulses and cereals in India from 1950-51 to 2007-08.

S.No.	Year	Area (million hectares)		Production (million tonnes)		Yield (Kg. /ha.)	
		Cereals	Pulses	Cereals	Pulses	Cereals	Pulses
1	TE1952-53	79.55	19.24	45.19	8.67	576	451
2	TE1962-63	92.86	24.02	69.63	12.00	750	499
3	TE1972-73	100.20	21.87	92.60	10.94	924	500
4	TE1982-83	103.92	23.04	119.47	11.33	1150	492
5	TE1989-90	102.10	22.61	147.88	12.56	1446	555
6	TE1992-93	101.54	22.50	188.13	13.77	1852	612
7	TE1999-00	101.10	23.19	161.72	13.03	1600	562
8	TE2002-03	98.28	20.80	182.96	11.86	1859	570
9	TE2007-08	100.11	23.07	204.77	14.12	2046	612

Source: *Agricultural Statistics at a glance 2009, Ministry of Agriculture, Govt. of India.*

The increment in the pulses production has been only 17.67percent as compared about to 194 percent in case of cereals. Yields too have shown a similar trend with only 23 percent increase in pulses as compared to 172 percent in cereals. It reflects the stagnant condition of pulses production.

Though India is a major pulses growing country in the world it has faced the problem of supply and demand gap in pulses since mid seventies. Depending on the domestic short fall in pulses production, India's net import of pulses have ranged from 1 to 3 million tonnes while exports are one tenth of the volume of imports. Following table gives supply and consumption of pulses in India.

Table 1.3: Supply and consumption of pulses in India.

(Million tonnes)

S. No.	Years	Production	Imports	Exports	Total consumption
1	2000-01	11.1	0.4	0.2	11.3
2	2001-02	13.4	2.2	0.2	15.4
3	2002-03	11.1	2.0	0.2	12.9
4	2003-04	14.9	1.7	0.2	16.4
5	2004-05	13.1	1.3	0.3	14.1
6	2005-06	13.1	1.6	0.4	14.3
7	2006-07	14.2	3.7	0.4	17.5
8	2007-08	14.8	2.8	0.2	17.4
9	2008-09	14.2	2.3	0.1	16.4

Source: Agricultural statistics at a glance, 2009, GOI, MoA, India.

The growth in production and productivity of pulses has lagged behind the population growth rate which has resulted in decline in per capita availability of pulses from 61 grams in 1951 to 36 grams in 2007 (42 gram 2008, provisional). The quantity of

pulses intake recommended by the Indian council of medical research is about 65 grams per day.

Table 1.4: per capita net availability of food grains in India.

(Gram/day)

S.No.	Year	Rice	Wheat	Cereals	Gram	Pulses	Food grains
1	1951	158.9	65.7	334.2	22.5	60.7	394.9
2	1961	201.1	79.1	399.7	30.2	69.0	468.7
3	1971	192.6	103.6	417.6	20.0	51.2	468.8
4	1981	197.8	129.6	417.3	13.4	37.5	454.8
5	1991	221.7	166.8	468.5	13.4	41.6	510.1
6	2001	190.5	135.8	386.2	8.0	30.0	416.2
7	2002	228.7	166.6	458.7	10.7	35.4	494.1
8	2003	181.4	180.4	408.5	8.5	29.1	437.6
9	2004	195.4	162.2	426.9	11.2	35.8	462.7
10	2005	177.3	154.3	390.9	10.6	31.5	422.4
11	2006	198.0	154.3	412.8	10.7	32.5	445.3
12	2007	194.0	157.8	407.9	11.9	35.5	443.4
13	2008(P)	175.4	145.1	374.6	10.6	41.8	416.4

Source: Source: Agricultural statistics at a glance, 2009, GOI, MoA, India. (P) Provisional

The demand and supply gap is also reflected in the higher prices of pulses in recent years. The recent price hike is the result of the simultaneous occurrence of lower stock level and less production both in domestic and global markets and to some extent speculative activity in the commodity future markets.[1]

Looking into the importance of pulses, government has initiated many development programmes for pulses.

[2]to enhance adoption of improved technology, a centrally sponsored National Pulses Development Project (NPDP) is in operation since the Eight Plan (1985-89). Programme Implementation, coordination, policy formulation, feedback mechanisms and monitoring etc is ensured by the directorate of Pulses Development. To provide further impetus, the pulses sector has been brought under the ambit of the technology mission on Oilseed and pulses (TMOP) since 1990. During the tenth five year plan, it was imposed to implement the integrated scheme of oilseeds, pulses, oil palm and maize (ISOPOM) after merging four centrally sponsored ongoing schemes on oilseed, pulses, palm oil and maize to make the programme more integrated and financially sound with major emphasis on seed production, distribution and adoption of improved technology.

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[1] and [2] Reddy A. Amarender “Pulses production technology: status and way forward,” Economic and political weekly, Dec. 26, 2009.

Considering the importance of pulses in food security, the national food security mission (NFSM) was launched during the eleventh five year plan (2008-12) targeting important food grain crops rice, wheat, pulses. The primary objective of the pulses component of the mission is to increase production of pulses by 2 million tonnes through increase in area and productivity. The mission targets an area of 17 million hectares under pulses in 171 identified districts. Close to 4.05 million hectares was to be added to the area under cultivation by 2011-12 through the utilization of rice fallow and inter cropping with wider spaced crops.

Despite all these incentives programmes, production of pulses have remained almost stagnant or registered slight increase in between the years. Since last year, the prices of potatoes, sugar, pulses and oils in the country have increased by 40-100 percent. A shortage of pulses can have devastating long term effects on our national nutritional standards. Indians will suffers the most if the country does not find a way out of the pulses crises, because other societies do not depend as much on pulses for proteins. Dr.Ashok Ganguly in a speech said almost 30 years ago, "pulses are such an important part of the diet that unless major steps are taken, we will contribute to calorie malnutrition as well as amino acid deficiencies"[3]. This stands true today also.

Looking into the importance of pulses in diet, in increasing soil fertility and stagnation in its production, it becomes necessary to find out constraints and outline the prospects for pulses production in the country. Keeping in this view, the Ministry of agriculture, Govt. of India has entrusted the Agro – Economic Research Centre, , Jabalpur a project "**Possibilities and constraints in increasing Pulses Production in Madhya Pradesh and the Impact of National Food Security Mission on Pulses"** with the following objectives.

[3] R Gopalakrishnan, the Economic Times, Ahmedabad February 1, 2010.

1.2 OBJECTIVES

1. Analyze returns from cultivation of pulses *vis-a-vis* competing crops.
2. Analyze the other major problems and prospects for pulses cultivation.
3. Assess the impact, if any, of NFSM Pulses.

1.3 METHODOLOGY

The study is based on both secondary and primary data. The methodology and sample design followed for the study is as suggested by the coordinator Centre.

A. Secondary data:

The secondary data was collected from the official publications and government offices of the state from 1997-98 to 07-08. The data collected include:

1. Area, production and yield of major pulses and other major crops grown in the state.
2. Gross Cropped Area (GCA), net sown area (NSA), gross irrigated area (GIA), net irrigated area (NIA), area irrigated under major pulses, area under improved varieties (IVs), fertilizer consumption etc.

The growth rates have been worked out by fitting a semi log trend using above data and presented for the period 1997-98 to 07-08. The average of 1997-98 to 1999-2000 is taken as a base year for calculating compound growth rates.

B. Primary data:

(I) Selection of districts

The reference year for the primary data survey was from 2006-07 to 2008-09. As per study design one NFSM district and Non – NFSM district from the state were selected. The NFSM has been implemented in 20 district of Madhya Pradesh during 2006-07 to 2008-09. List of the districts under NFSM and non-NFSM is given in below table.

Table1.5: Districts covered under NFSM and non-NFSM in Madhya Pradesh during 2006-07 to 2008-09.

Sr. No.	NFSM district	Sr. No.	Non-NFSM district
1	Vidisha	1	Sehore
2	Sagar	2	Ashoknagar
3	Shajapur	3	Hoshangabad
4	Narsinghpur	4	Datia
5	Rajgarh	5	Indore
6	Raisen	6	Ratlam
7	Ujjain	7	Bhopal
8	Damoh	8	Harda
9	Chhatarpur	9	Dhar
10	Dewas	10	Khandwa
11	Jabalpur	11	Betul
12	Panna	12	Mandsaur
13	Shivpuri	13	Khargone
14	Satna	14	Gwalior
15	Guna	15	Morena
16	Tikamgarh	16	Katni
17	Seoni	17	Bhind
18	Chhindwara	18	Neemach
19	Jhabua	19	Sheopur
20	Rewa	20	Badwani
		21	Burhanpur
		22	Sidhi
		23	Sahadol
		24	Umaria
		25	Balaghat
		26	Mandla
		27	Anuppur
		28	Dindori

The selection of the districts for field work was based on area under pulses and the discussion carried out with the officials of state government at Bhopal. Accordingly, Vidisha was selected as NFSM district and Sehore as Non-NFSM district. Vidisha has on an average

(II) Selection of Villages

On the basis of the discussion with district level officers at district Agricultural offices of the Vidisha and Sehore, sample village were selected. In NFSM district Vidisha a number of districts were selected due to non-availability of required number of beneficiaries in one or two pillages and the villages selected were Gamakar, Rupethi, Madnai, Kurwai, Mandibamora etc and in non-NSFM district Sehore, Pipliya meera, Chanderi and Bhagwanpura villages were selected for field survey. These villages have large number of pulses growers.

(III) Selection of sample farmers

For the selection of sample farmers all the farmers of selected villages who had grown pulses during the reference years of the study were classified into four size group such as marginal (0-1 hectares), small (1-2 hectares), medium (2-4 hectares) and large (above 4 hectares) including SC, ST, OBC and women farmers. From each size group of pulses growers, numbers of farmers were selected at randomly and 50 sample pulses growers were selected from each NFSM district Vidisha and non-NFSM district Sehore. Thus, altogether 100 farmers were selected for the data collection.

For profitability analysis, the method used to calculate return on pulses and other crops is as below.

Gross return = value of main product (production*price) + value of by product

Net returns =gross returns /paid out costs

Value of marketed surplus = quantity sold* price

Gross returns/ha =gross returns/area sown under the crop

Gross returns/qtl = gross returns/production of the crop.

(IV) Limitations of the study:

The present study based on the primary and secondary data; the most important limitation of the study is related to the pertaining of data. This study pertains to the primary data collected for paddy of the agriculture year 2006-07. Moreover, the paddy growers provided the information based on their recall memory. Thus, there is a possibility of certain memory bias to enter in the presentation of data. Therefore, considerable care should be taken while generalizing the applicability of the results of this study to other areas.

CHAPTER II

PULSES SECTOR IN THE STATE AND THE DISTRICT

This chapter is divided in two sections

A. Pulses sector in the state and the districts

B. Profile of the selected districts

Area, production and yield is an average of five years i.e. 2004-05 to 2008-09 unless otherwise is mentioned and compound annual growth rate is calculated for the period from 1997-98 to 2007-08 for area, production, yield and irrigated area.

A. Pulses sector in the state and districts.

2.1 Profile of the state

The total geographical area of the state was found to be 307.56 lakh ha in which 49.01 per cent land was found to be under cultivation and 11.02 per cent land not available for cultivation. The 4.42 per cent of total land was classified under cultivable waste land, while 3.38 per cent of total in fallow land. The cropping intensity of the state was found to be 130.76 per cent

(Table2.1)

Table2.1: Land use classification of Madhya Pradesh.

S. No.	Particulars	Area (lakh ha)	Percentage to geographical area
1	Geographical Area	307.56	100.00
2	Forest	85.89	27.93
3	Area not available for cultivation	33.89	11.02
4	Other non-agricultural land (excluding fallow land)	13.58	4.42
5	Cultivable waste land	11.61	3.77
6	Fallow land	11.85	3.85
7	Net area sown	150.74	49.01
8	Double cropped area	46.37	15.08
9	Gross area sown	197.11	64.09
10	**Cropping intensity (%)**	**130.76**	

2.1.1 Irrigation status

Wells (39.93%), tube wells (25.42%), canals (18.31%) and tanks (2.35%) were found the major sources of irrigation in M.P. the state had 5681thousand ha area under irrigation. The irrigation intensity of the state was found to be only 103.47 per cent and 37.69 per cent of the net cropped area of the state was found under irrigation (Table2.2).

Table 2.2: Irrigation status of Madhya Pradesh

(000'ha)

S.No.	Source	Net irrigated area	Percentage to total	Gross irrigated area	Percentage to total
1	Canal	1030	18.13	1076	18.31
2	Tanks	134	2.36	138	2.35
3	Tube well	1449	25.51	1494	25.42
4	Well	2246	39.54	2347	39. 93
5	Others	822	14.47	823	14.00
6	Total	5681	100.00	5878	100.00
7	Percentage to net area sown	37.69			
8	Irrigation intensity	103.47			

2.1.2 Cropping pattern:

Madhya Pradesh had rich diversity and occupied nearly all the cereals (38.33%), pulses (21.38%), oilseeds (30.37%), fibers (3.09%), fruits & vegetables (1.23%), spices (1.06%) in his total food and non food basket (19710thousand ha), the wheat (18.66%), paddy (8.43%), jowar (2.87%), maize (4.25%) to be found main cereals (7555thousand ha)crops of the state. The chickpea (12.53%), tur (1.59%), and lentil (2.87%), peas (1.08%) were found to be main pulses crop of the state. Madhya Pradesh, known for soybean and occupied 22.63 per cent of the state food and non food crops area of the state. Apart from soybean, seasamum, linseed, groundnut, mustard and rapeseed were found to be the other oilseeds grown by the cultivators in the state. (Table2.3)

Table2.3: Cropping pattern of Madhya Pradesh **(000'ha).**

S. No.	Crops	Area	Percentage to total cropped Area	Yields (kg/ha)
1	Wheat	3785	18.66	1638
2	Paddy	1711	8.43	990
3	Jowar	583	2.87	1041
4	Maize	863	4.25	1446
5	Other cereals	613	3.02	--
6	**Total cereals**	**7555**	**37.24**	--
7	Gram	2541	12.53	936
8	Tur	323	1.59	749
9	Lentil	582	2.87	503
10	Peas	219	1.08	475
11	Torea	48	0.24	667
12	Urid	483	2.38	354
13	Mung	77	0.38	325
14	Kulthi	27	0.13	296
15	Other pulses	32	0.16	
16	**Total pulses**	**4332**	**21.36**	**752**
17	**Total food grains**	**11887**	**58.60**	**1135**
18	Sugarcane	52	0.26	4308

19	Total spices	208	1.03	--
20	Total fibers	609	3.00	--
21	Total fruit & vegetable	243	1.20	--
22	**Total food crops**	**12999**	**64.08**	**--**
23	Sesamum	185	0.91	395
24	Linseeds	132	0.65	402
25	Groundnut	208	1.03	1111
26	Rapeseed & mustard	831	4.10	1030
27	Soybean	4590	22.63	1049
28	Other oilseeds	111	0.55	0
29	**Total oilseeds**	**6057**	**29.86**	**1000**
30	Cotton	603	2.97	1176
31	Total medicinal & narcotics	16	0.08	--
32	Fodder crops	588	2.90	--
33	Other miscellaneous crops	22	0.11	--
34	**Total non-food crops**	**7286**	**35.92**	**--**
35	**Total food & nonfood crops**	**20285**	**100.00**	**--**

2.1.3 Area of food and non-food crops

Table 2.4 indicated that 37.24 percent area was covered under total cereals followed by29.86 by oil seeds and 21.36 percent by pulses. Altogether total food crops covered 58.60 and total non- food covered 35.92 percent (Table 2.4)

Table2.4: Area of food and non food crops of Madhya Pradesh (000'ha).

S.No.	Particulars	Area	% to Total
1	**Total cereals**	7,555	37.24
2	**Total pulses**	4,332	21.36
3	**Total oilseeds**	6,057	29.86
4	**Total food crops**	11,887	58.60
5	**Total non food crops**	7,286	35.92
6	**Total**	20,285	100.00

2.2: Agro – climatic zones of Madhya Pradesh

2.2.1Agro – climatic zones

The State is divided in the following 11 Agro Climatic Zones: (1) Chhattisgarh plains (Balaghat district falls in this zone) (2) Northern hill region of Chhattisgarh (Districts of Shahdol, Mandla, Dindori, Anuppur, Umaria and part of Sidhi fall in zone) (3) Kymore plateau and Satpura hills (4) Central Narmada Valley (5) Vindhya Plateau (6) Gird region (7) Bundel Khand (8) Satpura Plateau (9) Malwa Plateau (10) Nimar Plains (11) Jhabua hills. Agro ecologically the state falls in three

zones namely, Zone –VII (Eastern Plateau and hills Zone), Zone VIII (Central plateau and hills Zone) and Zone IX (Western Plateau and hills Zone).

Table2.5: Area under important crops in the state

(Average of last five years 2003-04 to 2007-08)

Crops	Area under the crop	Percentage of area to GCA
Rice	1689	4.36
Wheat	4090.4	10.57
Sugarcane	55.2	0.14
Cotton	604	1.56
Pulses	4410.8	11.40
Other major crops	13925.2	35.98
Total	**38699.8**	**100.00**

The above table has brought out fact that wheat has remained the most important crop of Madhya Pradesh followed by rice, cotton and other major crops. Pulses are also an important crop as its contribution in the GCA was on average 11.40 percent during the 2003 to 2008.

Table 2.6: Compound annual growth rate (CAGR) over 1997 – 2008 of A, P, Y of important crops in the states.

Area:-000'hectare, production:-000'tonnes, yield:-kg. /hectare

Crops	Area under the crop	Production	Yield
Rice	1.524	0.760	-0.752
Wheat	-0.718	-0.447	0.273
Sugarcane	5.431	6.490	1.004
Cotton	2.746	8.874	5.965
Pulses	1.024	-0.030	-1.046
Other major crops	0.281	1.042	0.759
Total	**10.288**	**16.689**	**6.203**

Table 2.7: CAGR over 1997 – 2008 of important variables in the state

Area:-000'hectare, production:-000'tonnes, yield:-kg. /hectare

Year	NSA	GCA	NIA	GIA	NIA/NSA	GIA/GCA	FERT. Consum.	Fert. Cons. per hac.
1997-98	199.4	260.7	5232	5405	20.07	20.73	975.90	47.90
1998-99	199.54	261.25	5224	5367	20.00	20.54	986.30	48.40
1999-00	150.7	204.18	5514	5668	27.01	27.76	943.50	46.30
2000-01	147.66	179.73	5661	5828	31.50	32.43	715.20	35.00
2001-02	149.62	191.46	4135	4285	21.60	22.38	772.50	37.90
2002-03	146.2	181.81	4735	4899	26.04	26.95	704.70	38.80
2003-04	150.48	198.91	4494	4631	22.59	23.28	983.40	49.40
2004-05	150.78	203.05	5631	5776	27.73	28.45	1066.30	56.50
2005-06	150.74	197.1	6042	6193	30.65	31.42	940.80	52.10
2006-07	148.38	202.16	5682	5878	28.11	29.08	1205.10	62.70
2007-08	147.9	205.19	6418	6567	31.28	32.00	1469.80	76.50
CAGR	**-2.363**	**-1.843**	**1.562**	**1.523**	**3.467**	**3.431**	**3.591**	**4.606**

2.3 Position of Madhya Pradesh in pulses production

Presently in India, 23.41 million hectares area is under pulses, production of pulses is 14.48 million tonnes with the average yield of 619kg/ha.

Table2.8: Major pulses producing states in India (average: 2006-07 to 2007-08)

(Area in million hectares, production in million tonnes, yields in kg/ha.)

S.No.	State	Area	% to all India	Production	% to all India	Yield
1	Madhya Pradesh	4.07	17.39	2.83	19.51	694
2	Maharashtra	3.95	16.85	2.66	18.37	674
3	Rajasthan	3.54	15.12	1.52	10.46	428
4	Uttar Pradesh (UP)	2.44	10.42	1.78	12.29	730
5	Karnataka	2.38	10.15	1.08	7.46	455
6	Andhra Pradesh (AP)	2.05	8.74	1.53	10.53	746
7	Gujarat	0.94	4.02	0.67	4.59	707
8	Chhattisgarh	0.92	3.91	0.52	3.56	563
9	Orissa	0.83	3.52	0.37	2.52	442
10	Bihar	0.61	2.61	0.47	3.25	770
11	Others	1.71	7.28	1.08	7.46	633
	All India	23.41	100	14.48	100	619

Source: Agricultural statistics at a glance, 2009, GOI, MoA, India

The above table indicated that the estimated share of different states in the total pulses area and production during TE 2007-08 has shown that Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh and Karnataka contributed about 70 percent to the total pulses area and about 68 percent to the total production. Madhya Pradesh acquired first position in pulses area and production also

It can be observed from the table mentioned below that gram alone occupied 61.54 percent of the total area under pulses followed by urid 12.44 and lentil 12.30 the other pulses shared the rest of the area(Table 2.9)

Table 2.9 Area under important pulses in the state

(Average of last five years 2003-04 to 2007-08)

Pulses Crops	**Area under the crop**	**Percentage of area to GCA**
Tur	313.8	7.27
Gram	2655.6	61.54
Lentil	530.6	12.30
Urid (Rabi)	537	12.44
Moong (Rabi)	79.8	1.85
Peas	198.2	4.59
Total	**4315**	**100.00**

2.4 Area, production, yield and irrigated area under pulses

Gram

Gram is the major rabi pulse crop grown in Madhya Pradesh. It was cultivated in the area of 2414 thousand hectares during 1997-98 which increased to 2662 thousand hectares during 2007-08. No definite trend in area, production and yield of this crop could be noticed over the study period. Overall production increased significantly at the rate of 2.264 percent in the state. Average yield varied between 694 kg/ha to 988 kg/ha during the same period. The growth of Gram yield (1.425%) and moderate growth was registered by area of gram (0.826%) (Table 2.10).

Table 2.10 Area, production, yield and irrigated area under pulses: pulse crop: gram

Area:-000'hectare, production:-000'tonnes, yield:-kg. /hectare

Year	Area	Production	Yield	Irrigated area	Area under improved varieties
1997-98	2414	2367	981	NA	NA
1998-99	2580	2515	975	NA	NA
1999-00	2575	2536	985	NA	NA
2000-01	1978	1620	820	NA	NA
2001-02	2554	2408	944	NA	NA
2002-03	2471	1713	694	NA	NA
2003-04	2791	2585	927	NA	NA
2004-05	2693	2475	920	NA	NA
2005-06	2541	2378	937	NA	NA
2006-07	2591	2557	988	NA	NA
2007-08	2662	1926	724	NA	NA
CAGR	**0.826**	**2.264**	**1.425**	**NA**	**NA**

Tur

Tur is a kharif pulse crop of the state. The area under tur cultivation decreased significantly from 304 thousand hectares in 1997-98 to 304 thousand hectare in 2007-08. The area; production and yield have shown negative growth at the state level. Area has decreased at the rate of 0.252 per cent and yield at the rate of 0.597 per cent resulting decreased in production at the rate of 1.786 per cent during the study period (Table2.11).

Table 2.11 Area, production, yield and irrigated area: Tur

Area:-000'hectare, production:-000'tonnes, yield:-kg. /hectare

Year	Area	Production	Yield	Irrigated area	Area under improved varieties
1997-98	323	228	706	NA	NA
98-99	321	293	713	NA	NA
99-00	311	270	870	NA	NA
00-01	313	210	668	NA	NA
01-02	305	251	818	NA	NA
02-03	304	188	614	NA	NA
03-04	315	256	809	NA	NA
04-05	318	248	775	NA	NA
05-06	323	242	744	NA	NA
06-07	309	213	691	NA	NA
07-08	304	197	802	NA	NA
CAGR	**-0.252**	**-1.786**	**-0.597**	**NA**	**NA**

Lentil

Lentil is also a Rabi pulse crop like gram of the state. The area under lentil cultivation increased significantly from 463 thousand hectares in 1997-98 to 522 thousand hectare in 2007-08. The area and production of lentil have shown positive growth at the state level. However the yield has decreased at the rate of 0.012 per cent over the same period (Table 2.11).

Table 2.12 Area, production, yield and irrigated area: Lentil

Area:-000'hectare, production:-000'tonnes, yield:-kg. /hectare

Year	Area	Production	Yield	Irrigated area	Area under improved varieties
1997-98	463	203	438.44	NA	NA
1998-99	496	240	483.87	NA	NA
1999-2000	507	274	539	NA	NA
2000-01	489	207	422	NA	NA
2001-02	500	240	481	NA	NA
2002-03	467	181	387	NA	NA
2003-04	479	240	501	NA	NA
2004-05	530	263	496	NA	NA
2005-06	582	293	503	NA	NA
2006-07	540	262	485	NA	NA
2007-08	522	221	423	NA	NA
CAGR	**1.347**	**1.332**	**-0.012**	**NA**	**NA**

2.5 Total pulses

Overall, the area under total pulses increased from 4020 thousand hectares in 1997-98 to 4398 thousand hectare in 2007-08 whereas the production and yield recorded a decrease trend. The production and yield have shown negative growth at the state level. Area has increased at the rate of 1.024 per cent and production and yield decreased at the rate of 0.030 per cent and 1.046 percent per annum over the period (Table 2.12).

Table 2.13 Area, Production, Yield and Irrigated area: Total Pulses

Area:-000'hectare, production:-000'tonnes, yield:-kg. /hectare

Year	Area	Production	Yield	Irrigated area	Area under improved varieties
1997-98	4020	3081	766.42	NA	NA
98-99	4222	3374	799.15	NA	NA
99-00	4226	3427	811	NA	NA
00-01	3554	2275	640	NA	NA
01-02	4170	3224	773	NA	NA
02-03	4137	2376	574	NA	NA
03-04	4585	3488	761	NA	NA
04-05	4472	3351	749	NA	NA
05-06	4332	3259	752	NA	NA
06-07	4267	3351	785	NA	NA
07-08	4398	2674	608	NA	NA
CAGR	**1.024**	**-0.030**	**-1.046**	**NA**	**NA**

2.6: PROFILE OF NFSM DISTRICT VIDISHA

Vidisha district situated at 23^0.20' to 24^0.22' north longitude and 77^0.16' to 78^0.18' east latitude in the global of the earth. It is situated 428.96 M heights from MSL. There are 7 tehsils namely Vidisha, Gyaraspur, Basoda, Nateran, Kurvai, sironj, Lateri and 7 developed blocks namely vidisha, Gyaraspur, Basoda, Nateran, Kurvai, sironj, Lateri present in the district. The district having 1533 village comprises in 580 village panchayat. The number of electrify villages are 98.30 percent in the village reveals tha the whole district have electricity facilities. The total geographical area of the district is of 7971 sq km.

S. No	Particular	Figures
1	Geographical area (sq. km)	7371
2	Height from mean sea level	428.96
3	North longitude	23^0.20' to 24^0.22'
4	East latitude	77^0.16' to 78^0.18'
5	Number of tehsil	7
6	Number of Blocks	7
7	Number of Villages	1533
8	Number of Gram panchayat	580
9	Number of Electrified village	1507
10	Percentage of Electrified village to total villages	98.30

2.6.1: population of Vidisha District

As per the 2001 census the total population of the district was 12.15 lakh, out of which the percentage of male and female was 53.33 percent and 46.67 percent respectively. Vidisha district is a rural background district as 78.57 percent population of the district residing in rural area the percentage of schedule caste and schedule tribes was 19.85 and 4.88 percent respectively. The total number of farmers has 11.86 percent to the total population of the district. The 37.19 percent

of the population were found engaged in the works, while 62.81 percent were under non worker category.

Table 2.14: population parameters of Vidisha district (Census 2001)

S.No.	Particulars	Numbers	% to total
1	Total Population	1214860	100.00
A	Male	647840	53.33
B	Female	567020	46.67
2	Sex Ratio per thousand male	875	
3	Rural population	954490	78.57
A	Male	509861	53.42
B	Female	444629	46.58
4	Urban population	260367	21.43
A	Male	137977	52.99
B	Female	122390	47.01
5	Population of Schedule Caste	241131	19.85
A	Male	129018	53.51
B	Female	112113	46.49
6	Population of Schedule Tribes	59323	4.88
A	Male	30960	52.19
B	Female	28363	47.81
7	Number of literate person	608083	50.05
8	Number of Farmers	144055	11.86
A	Male	129297	89.76
B	Female	14758	10.24
9	Agriculture Labour	100508	8.27
A	Male	74861	74.48
B	Female	25647	25.52
10	Home industries	8435	0.69
A	Male	5691	67.47
B	Female	2744	32.53
11	Other Workers	93223	7.67
A	Male	81601	87.53
B	Female	11622	12.47
12	Total main Workers	346221	28.50
A	Male	291450	84.18
B	Female	54771	15.82
13	Marginal Workers	105566	8.69
A	Male	39941	37.84
B	Female	65625	62.16
14	Total Workers	451787	37.19
A	Male	331391	73.35
B	Female	120396	26.65
15	Non Workers	763070	62.81
A	Male	316447	41.47
B	Female	446623	58.53

2.6.2: Land use pattern of the district

The total geographical area of the district was found to be 730197 ha., out of which 14.86 per cent of the total land was under forest area (2006). The 72.73% of land was comes under net area sown, while only 6.48% of land was under nonagricultural uses. The cropping intensity of the district was found to be 124.83% (table 2.13)

Table2.15: Land use classification of Vidisha district

s. no.	Particulars	Area (ha)	%to Geographical Area
1	Geographical Area	730197	100.00
2	Area under Forest	108580	14.86
3	Area not available for cultivation	47314	6.48
4	Area under other non-agricultural land (excluding fallow land)	19460	2.67
5	Area under cultivable waste land	17405	2.38
6	Fallow land	6367	0.87
7	Net area sown	531071	72.73
8	Double cropped area	131859	
9	Gross area sown	662930	
10	Cropping intensity (%)		124.83

2.6.3: Irrigation status of Vidisha district

The Vidisha district had 45.78 per cent of net irrigated area to net cultivated area. The 16.16 per cent, 15.90 per cent and 1.75 per cent of total net irrigated area was found to be irrigated by wells, canals and tanks while, 41.25 per cent was irrigated by tube well. The irrigated area by other sources (24.92%) such as stop dams, nalas also found the major source of irrigation in the area (Table 2.14).

Table 2.16: Irrigation status of Vidisha district

S.No.	Particulars	Numbers	Area (ha)	% to Total
1	Canal Govt/Private	11	38656	15.90
2	Tube well	12193	100295	41.25
3	Well	11822	39305	16.16
4	Tank	23	4256	1.75
5	Other sources	-	60638	24.94
6	Net irrigated area by all sources	-	243150	100.00
7	% of net irrigated area to net cultivated area		45.78	

2.6.4: Cropping pattern of the district

The Vidisha district had 662894 ha of land under total food and non-food crops. Out of which total food grains (78.10%) possess the highest area. The district is pre dominantly pulse growing district, contributed 45.29 per cent area to total food and non-food crops. In pulse group chickpea (64.59%) had occupied, the highest area apart from pulses, cereals contributed 32.81 per cent area to total food and non-food crops. In cereals, wheat (31.06%) had occupied maximum area under cultivation followed maize (0.85%), jowar (0.68%) and paddy (0.09%). Soybean, a oilseed crops also grown in kharif season by the cultivators, contributing 18.77 per cent to total food and non-food crops. On non-food crops only fodder was found to be grown by the cultivators (Table 2.15)

Table 2.17: Cropping pattern of Vidisha district.

S.No.	Crops	Area (ha)	% to total
1	Wheat	206566	31.06
2	Paddy	619	0.09
3	Jowar	4556	0.68
4	Maize	5774	0.87
5	Other cereals	721	0.11
A	Total cereals	218236	32.81
6	Chickpea	194560	29.25
7	Pegion pea	916	0.14
8	Black gram	19231	2.89
9	Other pulses	86508	13.01
B	Total pulses	301215	45.29
C	Total food grains	519451	78.10
10	Sugarcane	274	0.04
11	Total Fruits	263	0.04
12	Total Vegetable	1818	0.27
13	Total Spices	4431	0.67
D	Total food crops	526237	79.12
14	Cotton	7	0.00
15	Other fibers	32	0.00
16	Total fibers	39	0.01
17	Seasame	213	0.03
18	Linseed	329	0.05
19	Groundnut	684	0.10
20	Rapeseed & Musterd	923	0.14
21	Soybean	124862	18.77
22	Other Oilseed	2173	0.33
E	Total Oilseed	129262	19.43
23	Tobacco	0	0.00
24	Other medicinal & Narcotics	3	0.00
25	Total Medicinal & Narcotics	11	0.00
26	Fodder crops	9603	1.44
27	Other Miscellaneous Crops	5	0.00
F	Total Non-food crops	138884	20.88
G	Total food & non-food crops	665121	100.00

2.6.5: size of holding of the district

As regards to yield per ha of different crops grown in the district maize (1160Kg/ha) gave highest yield to cultivators followed by Paddy (1969kg/ha), wheat (811kg/ha), soybean (789kg/ha), jowar (702kg/ha), pigeon pea (655kg/ha) and chickpea (689kg/ha), while, the production of wheat (167.5 thousand tonnes) was found to be the highest in the district followed by chick pea (132.9 thousand tonnes) and soybean (985 thousand tonnes). Others crops contributing negligible production in the district. (Table).

There were 140351 number of land holdings present in the district in which small land holdings (24.67%) was found maximum followed by semi medium (23.71%), marginal (22.82%), medium (21.54%) and large (7.86%). These holdings occupied 540066 ha of land. The large size (35.97%) holdings occupied the highest area followed by medium (34.89%), semi medium (17.09%), small (9.08%) and marginal (2.98%) in the district. The average size of holdings of the district was of 3.85 ha. The average size of

marginal holding was of 0.50 ha, while the average size of small, medium, semi medium and large size was of 1.42 ha, 2.85 ha, 6.23 ha and 17.61 ha respectively (Table 2.16)

Table 2.18: Size of holdings in Vidisha district

(Hectare)

S.No.	Particulars	Number	Area	Average size of Holding (ha)
1	Marginal Farmers (below 1 ha)	32026	16089	
2	% to Total	22.82	2.98	0.50
3	Small Farmers (1.01 to 2.00 ha)	34629	49011	1.42
4	% to Total	24.67	9.08	
5	Semi Medium Farmers (2.01to 4.00ha)	32374	92284	2.85
6	% to Total	23.07	17.09	
7	Medium Farmers (4.01 to 10.00ha)	30226	188411	6.23
8	% to Total	21.54	34.89	
9	Large Farmers (10.1 & Above)	11033	194271	17.61
10	% to Total	786	35.97	
	Total	140351	540066	3.85
		100.00	100.00	

Agriculture census 2001

As regards to live stock population of milch and drought animals, it is clear from the table {2.17}that there were 133305 animals were found to be present in the district, in which percentage of cow (55%) was found more followed by buffaloes (20%) and goats (22.17%). The percentages of female buffaloes (54.98%) were found more as compared to male buffaloes (2.38%). In cows male, female and calves were found to be in same percentage.

2.7: PROFILE OF THE NON-NFSM DISTRICT: SEHORE

Sehore is a city and a municipality in Sehore district in the Indian state of Madhya Pradesh. It is district headquarters of Sehore district and is located on the Bhopal - Indore highway, 37 km away from Bhopal. Some inscription on rocks discovered in the vicinity of modern Sehore its name as Sidhapur and Sidrapur. The location Sehore in the foothills of the Vindhyachal Mountains lends credence to this belief.

Sehore is 37km away from the state capital of Bhopal towards south-west and on Bhopal Indore highway. It's height from the sea level is 1500(ft) to 2000(ft).

Sehore is situated on the western railway line from Bhopal to Ratlam. Sehore is surrounded by six districts Bhopal, Raisen, Hoshangabad, Dewas, Shajapur and Rajgarh.

Sehore district extends between the parallels of latitude 22°31´to23°40´ north and between meridians of longitude 76°22´ and

78°08´ east. Sehore is located at 23°12´ N 77°05´E /23°2´N 77°.08´E. It has on average elevation of 502 meter (1646 feets).

S.No.	Particulars	Figures
1	Geographical area (sq.km.)	656368
2	Height from mean sea level (m)	457.19
3	North longitude	$22^0$31to$23^0$40
4	East latitude	$76^0$22to$78^0$88
5	Number of tehsil	5
6	Number of blocks	5
7	Number of villages	1076
8	Number of gram- panchayat	658
9	Number of electrified villages	1007
10	Percentage of electrified villages to total villages	93.58

2.7.1: Population of Sehore district

As of 2001 India census Sehore had a population of 90,930. Males constitute 52% of the population and females 48%. Sehore has an average literacy rate of 68%, higher than the national average of 59.5%: male literacy is 75%, and female literacy is 61%. In Sehore, 14% of the population is under 6 years of age. (Table 3.2)

Table 2.19: Population parameter of Sehore district

S.No.	Particulars	Numbers	Percentage to total
1	Total population	1078912	100
A	Male	565137	52.38
B	Female	513775	47.61
2	Sex ratio per thousand male		
3	Rural population	885172	82.04
A	Male	463139	42.92
B	Female	422033	39.11
4	Urban population	193740	17.95
A	Male	101998	9.45
B	Female	91742	8.50
5	Population of schedule caste	221077	20.49
A	Male	115754	10.72
B	Female	105323	9.76
6	Population of schedule tribes	116122	10.76
A	Male	59751	5.53
B	Female	56371	5.22
7	Number of literate persons	607953	
8	Number of farmers	164367	15.23
A	Male	119950	11.11
B	Female	44417	4.11
9	Agriculture labour	70630	6.54
A	Male	48383	4.48
B	Female	22247	2.06
10	Home industry	5407	0.05
A	Male	4371	0.04
B	Female	1036	0.09
11	Other workers	68029	6.30
A	Male	60749	5.63
B	Female	7280	0.67
12	Total main workers	308433	28.58
A	Male	233453	21.63
B	Female	74 980	6.94
13	Marginal workers	143009	13.25
A	Male	42598	3.94
B	Female	100411	9.30
14	Total workers	451442	41.84
A	Male	276051	25.58
B	Female	175391	16.25
15	None workers	627470	58.15
A	Male	289086	26.79
B	Female	338384	31.36

2.7.2: Land use pattern on of Sehore district

The total geographical area of the Sehore district was 656368 ha out of which 26.32% of the total land was found under forest area . The 58.84%of land was comes under net sown area, while only 7.04% of land was comes under non agriculture uses. The cropping intensity of the district was found to be 162.81per cent.

Table 2.20: Land use pattern of Sehore district (ha)

S.No.	Particulars	Area	% to total
1	Geographical area	656368	100
2	Area under forest	172776	26.32
3	Area not available for cultivation	46233	7.04
4	Area under other none agricultural land (excluding fallow land)	31287	4.76
5	Area under cultivable waste land	12159	1.85
6	Fallow land	7668	1.16
7	Net area sown	386245	58.84
8	Double cropped area	242624	
9	Gross area sown	628869	
10	Cropping intensity (%)	162.81	

2.7.3: Irrigation status of Sehore district

The Sehore district had 49.16 percent of net irrigated area to net cultivated area. The 32.30 percent, 44.60percent and 2.85 percent well, total net irrigated area by all resources was 189901ha out of which 32.23 percent was irrigated by tube well, canals and tanks respectively.

Table 2.21: Irrigation status of Sehore district

S.No.	Particulars	Number	Area (ha)	Percentage to geographical area
1	Canal govt./ private	94	38417	20.23
2	Tube well	21652	61357	32.30
3	Well	35517	84704	44.60
4	Tank	64	5423	2.85
5	Other sources	-	-	-
6	Net irrigated area by all sources	-	189901	100.00
7	% of net irrigated area to net cultivated area		49.16	

2.7.4: Cropping pattern of Sehore district

Sehore district had 628869 ha of land under total food and non-food crops. Out of total food grain49.31% possesses the highest area. The district is pre-dominantly pulse growing district, contributed 20.35% area to total food and non-food crops. In pulse group chick pea 18.45% had occupied. The highest area apart from pulses, cereals contributed 27.73%

area to total food and non-food crops. in cereals, wheat 24.33% had occupied maximum area under cultivation followed maize 2.27% jowar 0.36% and paddy 0.73% soybean a oilseed crops also grown in kharif season by the cultivators, contributing 44.93% to total food and non-food crops. In non-food crops only fodder was found to be grown by the cultivators. (Table 2.22)

Table 2.22: Cropping pattern of Sehore district (ha)

S.No.	Crops	Area	Percentage to total
1	Wheat	153062	24.33
2	Paddy	4645	0.73
3	Jowar	2311	0.36
4	Maize	14335	2.27
5	Other cereals	76	0.01
A	Total cereals	174429	27.73
6	Chickpea	116087	18.45
7	Pigeon pea	5586	0.88
8	Black gram	760	0.12
9	Other pulses	5551	0.88
B	Total pulses	127984	20.35
10	Sugarcane	2245	0.35
11	Total fruits	76	0.01
12	Total vegetables	2562	0.40
13	Total spices	2813	0.44
C	Total food grain	310109	49.31
14	Cotton	93	0.01
15	Other fiber	32	5.08
16	Total fibers	125	0.01
17	Sesame	108	0.01
18	Linseed	279	0.04
19	Groundnut	483	0.07
20	Rapeseed & mustard	57	9.06
21	Soybean	282554	44.93
22	Other oilseed	-	-
D	Total oilseed	283481	45.07
E	Total food crops	310109	49.31
23	Tobacco	-	-
24	Other medicinal & narcotics	-	-
25	Total medicinal & narcotics	-	-
26	Fodder crops	35149	5.58
27	Other miscellaneous crops	5	7.95
F	Total non-food crops	318760	50.68
G	Total food & none food crops	628869	100

2.7.5: Size of holdings of Sehore district (ha)

There were 149475 number of land holding present in the district in which small land holding (29.50%) was found maximum followed by semi medium (25.33%) marginal (25.04%) medium (17.44%) and large (2.67%) . these holdings occupied 405313 ha. of land.

The average size of land holding of the district was found to be 2.71 ha the average size of marginal holding was of 0.54 ha while the average size of small, medium, semi medium, and large size respectively was of 1.47, 2.74, 5.90 and 15.74 hectares. (Table 2.23)

Table 2.23: Size of holdings of Sehore district (ha)

S. No.	Particulars	Number	Area	Average size of holding
1	Marginal farmers (below 1 ha)	37440	20313	0.54
2	Percentage to total	25.04	5.01	
3	Small farmers(1.01 to 2.00 ha)	44097	65028	1.47
4	Percentage to total	29.50	16.04	
5	Semi medium farmers(2.01 to 4.00)	37866	103738	2.74
6	Percentage to total	25.33	25.59	
7	Medium farmers (4.01 to 10.00 ha)	26075	153736	5.90
8	Percentage to total	17.44	37.93	
9	Large farmers(10.1 & above)	3997	62894	15.74
10	Percentage to total	2.67	15.515	
11	Total	149475	405313	2.71

Annexure – 1

CAGR of Area, Production & yield of Major pulse Crops in Non-NFSM district Sehore From 1997-98 to 2007-08.

Pulse Crops	Area	Production	Yield	Irrigated area
Tur	**-2.981**	**-2.601**	**0.369**	NA
Urad Kharif	**N**	**4.510**	**1.913**	NA
Moong Kharif	**N**	**N**	**1.763**	NA
Total pulses Kharif	**-2.953**	**-2.521**	**0.440**	NA
Gram	**2.950**	**1.390**	**-1.056**	NA
Peas	**2.070**	**3.564**	**2.138**	NA
Lentil	**-3.401**	**-3.917**	**-0.473**	NA
Teora	**-12.182**	**-0.486**	**3.191**	NA
Total Pulse Rabi	**2.496**	**1.527**	**-0.943**	NA
Total Pulse Kharif & Rabi	**2.061**	**1.314**	**-0.732**	NA

N = Negligible

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CHAPTER III

DEMOGRAPHIC PROFILE AND CROPPING PATTERN OF THE SELECTED HOUSEHOLDS

This chapter deals with the socio economic profile of the sampled households of selected NFSM districts Vidisha and non NFSM district Sehore. Since the socio economic characteristics have a definite and decisive influence over various decision making process related to agriculture practices and profitability.

The information related to size of family, education level of the head of household and adult population, caste composition, land use pattern, cropping system and cropping pattern, area irrigated and various sources of irrigation, etc. has been analysed and discussed for various categories of the selected farmers of both the selected districts.

3.1 General overview of the selected farmers of NFSM district Vidisha

3.1.1 Family size

The population of 50 selected household of Vidisha district was 309. Of this, the population of adult male and female was almost equal in number. The total population of children was 116 (Table 3.1).

The average household population was more than six members per household. Among the various categories, large farmers had highest average population (6.77 no.per household) and lowest was in marginal category (5.5 no. per household).

Table 3.1 Demographic profile: NFSM District Vidisha

(Number)

	Adults			Children	Total	
	Males	Females	Total		No.	Per family
Marginal	16	15	31	24	55	5.5
Small	20	18	38	28	66	6.0
Medium	28	30	58	42	100	6.0
Large	32	34	66	22	88	6.77
Total	96	97	193	116	309	6.18

3.1.2 Education profile of the family

Average education level of the selected farmers observed to be very high. Eighty six per cent were either literate or attained education up to secondary and above level. Of this, more than three forth i.e. 76.00 per cent were educated up to higher secondary and above level and 10.00 per cent up to primary level. Remaining 14.00 per cent received no education. The same level of educational standard has been observed among all the categories as well. Among various categories, large categories showed highest number of their head of household received education up to secondary and above level (92.00 per cent) as compared to 87.00 82.00 and 80.00 per cent for medium, small and marginal categories respectively (Table 3.2).

Table 3.2 Education Profile and percentage distribution of the head of households

(No of Households)

	Illiterates	Primary	Secondary and above	Total
Marginal	2	3	5	10
%	(20.00)	(30.00)	(50.00)	(100.00)
Small	2	1	8	11
%	(18.00)	(9.00)	(73.00)	(100.00)
Medium	2	--	14	16
%	(13.00)		(87.00)	(100.00)
Large	1	1	11	13
%	(8.00)	(8.00)	(84.00)	(100.00)
Total	7	5	38	50
%	(14.00)	(10.00)	(76.00)	(100.00)

Figures given in parenthesis are percentage to total

The education profile of adult members of selected households of NFSM district Vidisha indicated the same trend as found in the above table. Of the total adult population, 83.00 per cent were educated up to secondary and beyond that level and only 17.00 per cent turned out to be illiterates.

Among various categories, adult population of medium category reported highest percentage of level of education (86.00%) i.e. secondary and above, as compared to their counter parts in other categories (Table 3.3).

Table 3.3 Education profile of the adult population NFSM District, Vidisha

(Population**)**

	Illiterates	**Primary**	**Secondary and above**	**Total**
Marginal	10	13	8	31
%	(32.00)	(42.00)	(26.00)	(100.00)
Small	6	10	22	38
%	(16.00)	(26.00)	(58.00)	(100.00)
Medium	12	18	32	58
%	(14.00)	(31.00)	(55.00)	(100.00)
Large	8	11	47	66
%	(12.00)	(17.00)	(71.00)	(100.00)
Total	32	52	109	193
%	(17.00)	(27.00)	(56.00)	(100.00)

Figures given in parenthesis are percentage to total

3.1.3 Caste composition

It was observed from distribution of selected households under different caste composition that 64 per cent households belonged to Other Backward Caste group and a sizable 22 percent belonged to general category. The share of Scheduled Caste and Scheduled Tribe was very small and only 6.00 per cent households were belonged to scheduled caste group and 2.00 per cent belonged to scheduled tribes (ST) group. The remaining households belonged to other caste group (6.00 per cent). This clearly indicates that agriculture was mostly in the hands of the farmers belonging to Other Backward Caste community (Table 3.4).

Table 3.4 Caste composition: NFSM district, Vidisha

(No of Households)

	SC	**ST**	**OBC**	**Others**	**General**	**Total**
Marginal	2	1	7	--	-	10
%	(20.00)	(10.00)	(70.00)			(100.00)
Small	1	0	8	2	-	11
%	(09.00)	0	(73.00)	(18.00)		(100.00)
Medium	--	--	10	1	5	16
%			(63.00)	6.00	(31.00)	(100.00)
Large	--	--	13	0	6	13
%			(100.00)	0.00	(46.00)	(100.00)
Total	3	1	32	3	11	50
%	(06.00)	(2.00)	(64.00)	6.00	(22.00)	(100.00)

Figures given in parenthesis are percentage to total

Category wise the share of OBC group in total households of marginal size group was 70.00 per cent. The share of SC and ST was 20.00 and 10.00 per cent respectively. There was no households belonged to other caste group. Among small farmers OBC were 73.00 per cent and 9.00 and 18.00 per cent were belonged to SC and other group respectively. In medium and large size categories, OBC contributed 94.00 and 100.00 per cent respectively. There were no scheduled tribe farmers in these groups.

3.2 General overview of selected farmers of Non NFSM district Sehore

3.2.1 Demographic profile

In the case of non NFSM district Sehore the average family had nearly 6 members per household with 67 per cent adult and 33 per cent children population. Of the total population, 118 were male and 102 were female. The numbers of children were 108. The sex ratio was in favor of male members. However, unlike Vidisha district the category wise population had no direct relationship with the size of land holding (Table 3.5).

Table 3.5 Demographic profile: non-NFSM District, Sehore

	Adults			Children	Total	
	Males	Females	Total			
Marginal	20	19	39	21	60	(6.0)
Small	26	27	53	22	75	(5.76)
Medium	32	28	60	30	90	(5.33)
Large	39	28	67	35	102	(5.80)
Total	117	102	219	108	327	(6.04)

3.2.2 Education status of head of households

The education status of head of households, presented in the table 3.5 showed that 82.00 per cent of the heads of household having some level of education, of this, 30.00 per cent attained education up to primary level and 52.00 per cent attained education up to secondary level and even beyond that level. Remaining 14.00 per cent household turned out to be illiterate or received no formal education (Table 3.6).

Table 3.6 Education Profile and percentage distribution of the head of households, Sehore

(No of households)

	Illiterate	Primary	Secondary and above	Total
Marginal	3	4	3	10
	(30.00)	(40.00)	(30.00)	(100.00)
Small	3	6	4	13
	(23.07)	(46.15)	(30.78)	(100.00)
Medium	1	3	11	15
	(6.66)	(20.00)	(73.34)	(100.00)
Large	2	2	8	12
	(16.67)	(16.67)	(66.66)	(100.00)
Total	9	15	26	50
	(18.00)	(30.00)	(52.00)	(100.00)

Figures given in parenthesis are percentage to total

Among the categories, highest literacy was found in the medium farmer's category and as high as 87 per cent heads of households were educated. The other categories have also showed the higher level of education status.(Table 3.6)

As far level of education of adult population, the medium and large size categories reported higher number of adult populations attained either secondary or above level of education as compared to their counter parts in marginal and small categories, whereas the higher number of heads of households reported education of households level up to primary level 35.00 percent and 36.00 per cent respectively) (Table 3.7).

Table 3.7: Education profile of the adult population: non- NFSM district, Sehore

(Number**)**

	Illiterates	Primary	Secondary and above	Total
Marginal	25	23	17	65
%	(28)	35	(27)	(100)
Small	17	26	30	73
%	(23)	36	(41)	(100)
Medium	11	15	41	67
%	(16)	22	(62)	(100)
Large	11	34	74	119
%	(9)	29	(62)	(100)
Total	64	98	162	324
%	(20)	30	(50)	(100)

Figures given in parenthesis are percentage to total

3.2.3 Caste composition non–NFSM district Sehore.

The caste composition of households of selected non NFSM district Sehore indicated that farmers were mostly belonged to OBC group and shared 58.00 per cent of the total farmers followed by others 22.00 per cent; schedule caste 14.00 per cent and 6.00 percent belonged to general category. None of the selected farmers belonged to any Schedule Tribe group.

Among various categories of sampled farmers of Sehore district. The proportion of farmers belonging to OBC was 50.00, 46.00, 67.00 and 66.00 per cent for marginal, small, medium and large size farmers respectively. No schedule caste farmer was found in medium and large size group (Table 3.8).

Table 3.8: Caste composition Non-NFSM district, Sehore

(No of Households)

	SC	ST	OBC	General	Others	Total
Marginal	4	0	5	-	1	10
%	40.00	0	50.00		10.00	100
Small	3	0	6	1	3	13
%	23.00	0	46.00	8.00	23.00	100
Medium	0	0	10	-	5	15
%	0	0	67.00		33.00	100
Large	0	0	8	2	2	12
%	0	0	66.00	17.00	17.00	100
Total	7	0	29	3	11	50
%	14.00	0	58.00	6.00	22.00	100

Figures given in parenthesis are percentage to total

3.3 Land holdings, area irrigated and cropping pattern, NFSM District Vidisha

The extent of area irrigated cropping pattern and sources of irrigation of the selected farm belonging to both NFSM and non NFSM have been given as Table 3.9.

Table3.9 Land holding and irrigation, selected farmers, NFSM district Vidisha

(Area irrigated)

	Irrigated					Unirrigated	Total
	Canal	Tube well	Tank	Others	Total		
Marginal	-	03.04	-	03.57	06.61	02.21	8.82
%	-	46.47	-	54.00	74.95	25.05	100.00
Small	-	6.63	-	05.75	12.38	04.75	17.13
%	-	53.55	-	46.45	72.27	27.73	100.00
Medium	-	27.20	-	17.10	44.30	08.30	52.60
%	-	61.40	-	38.60	84.22	15.78	100.00
Large	-	68.12	10.09	16.00	94.21	23.50	117.71
%	-	72.31	10.71	16.98	80.04	19.96	100.00
Total	-	104.11	10.09	42.42	157.50	38.76	196.26
%	-	66.67	6.40	26.93	80.25	19.75	100.00

Figures given in parenthesis are percentage to total

In the NFSM district Vidisha the total holding area was 196.26 hectares. Of this, 8.82 hectare belonged to marginal 17.13 hectare belonged to small 52.60 hectares belonged to medium and 117.71 hectares belonged to large size group.

The table also revealed that overall 80.25 per cent area of selected farmers was under irrigation and un- irrigated area was 19.75 per cent.

For different sources of irrigation, highest area, 66.67 percent, was irrigated by tube wells and the other sources together contributed 26.93 per cent to total irrigated area. The area irrigated by community tanks was 6.40 per cent of the total irrigated area.

3.3.1 Cropping pattern of selected farmers, NFSM district Vidisha

The information on average area (average of 2006-07 to 2008-09) allocated to different crops grown under different seasons by the farmers of NFSM district Vidisha has been given in the following tables.

The cropping pattern of the Vidisha district was predominantly soybean pulse wheat pulse based. Soybean was dominant in kharif season and wheat/gram in rabi season. Other pulses also found place in the cropping pattern of the farmers of the Vidisha district.

Cropping pattern of selected farmers showed that soybean occupied 45.38 per cent of the gross cropped area followed by the wheat 29.35 per cent pulses including Tur, gram, urid and lentil, together occupied 17.48 per cent. The remaining area was occupied by other small crops which are grown mostly for home consumption only and some small area was allocated to vegetable crops like potato, okra etc. (Tale 3.10).

Table 3.10 Cropping pattern-over all seasons: NFSM district Vidisha

(Average of 2006-07, 2007-08, 2008-09**)**

	Area sown				
	Soybean	**Wheat**	**Other major crops**	**Pulses**	**Total**
Marginal	6.81	4.70	2.53	4.31	18.35
Small	14.13	10.13	4.61	5.99	34.86
Medium	47.50	29.60	7.40	20.70	105.20
Large	110.00	71.00	16.11	37.71	234.82
Total	178.44	115.43	30.65	68.71	393.23
	Percentage of total area sown (%)				
	Soybean	**Wheat**	**Other major crops**	**Pulses**	**Total**
Marginal	37.11	25.61	13.79	23.49	100.00
Small	40.53	29.06	13.23	17.18	100.00
Medium	45.15	28.14	7.03	19.68	100.00
Large	46.84	30.24	6.86	16.06	100.00
Total	45.38	29.35	7.79	17.48	100.00

During the course of study it has been observed that farmer had shifted their area under pulse crops to credit crops like soybean because of uncertain whether conditions and pest problems.

3.3.2 Cropping pattern season wise

The season wise 3 year average cropping pattern of selected farmer is given in the table 3.11.

In the selected NFSM district Vidisha the cropping pattern was predominantly based on soybean crop which alone occupied 94.48 per cent area of total net cultivated area under kharif season and remaining 3.87 per cent area was occupied by kharif pulses like tur and urid. The other crop occupied only a meager 1.65 per cent area. The heavy dependence of soybean might be because this crop gives high return to farmers as compared to other crops and therefore considered as cash crop also.

Similarly, in rabi season the cropping pattern of selected farmers was seen to be in favour of wheat and pulses especially gram pulse. Of the total cultivated area, 63.50 per cent area was covered by wheat crop alone. The pulses, comprising gram, mung, urid and lentil together contributed 33.78 per cent of the total net cultivated area during rabi season. The share of other major crop was only 2.72 per cent.

In summer or zaid season some of the farmers took vegetable crops like potato, lady finger and bottle guard.

Table 3.11: Cropping pattern season wise: NFSM district Vidisha

(Average of 2006-07, 2007-08, 2008-09**)**

	Kharif				
	Soybean	**Wheat**	**Other major crops**	**Pulses**	**Total**
Marginal	6.81	-	0.59	1.02	8.42
Small	14.13	-	0.61	1.39	16.13
Medium	47.50	-	1.20	1.90	50.6
Large	110.00	-	0.71	3.00	113.71
Total	178.44	-	3.11	7.31	188.86
RABI					
	Rice	**Wheat**	**Other major crops**	**Pulses**	**Total**
Marginal	-	4.70	0.33	3.29	8.32
Small	-	10.13	0.40	4.60	15.13
Medium	-	29.60	1.20	18.80	49.60
Large	-	71.00	3.00	34.71	108.71
Total	-	115.43	4.93	61.40	181.76
ZAID					
	Rice	**Wheat**	**Other major crops**	**Pulses**	**Total**
Marginal	-	-	1.61	-	1.61
Small	-	-	3.60	-	3.60
Medium	-	-	5.00	-	5.00
Large	-	-	12.40	-	12.40
Total	-	-	22.61	-	22.61

3.4 Land holdings and area irrigated, non- NFSM district Sehore

In non NFSM district Sehore, over 72.14 per cent area was irrigated and remaining 27.86 per cent was rain fed or un – irrigated and of this irrigated area 81.60 per cent was irrigated by tube well alone and 18.40 per cent was irrigated either by wells or rivers/ rive lutes. None of the area was irrigated by tank or canal (Table 3.12).

Table 3.12: Land holdings, irrigation and cropping pattern non-NFSM district Sehore

(Area irrigated**)**

	Irrigated					Unirrigated	Total
	Canal	Tube well	Tank	Others	Total		
Marginal	-	3.77	-	2.0	5.77	1.21	6.58
%	-	65.84	-	34.66	81.61	18.39	100
Small	-	12.81	-	1.00	12.81	6.01	18.82
%		92.76	-	7.24	68.07	31.93	100
Medium	-	23.80	-	6.06	29.86	8.40	38.26
%		79.70	-	20.30	78.04	21.96	100
Large	-	52.10	-	11.80	63.90	27.60	91.50
%		81.53	-	18.47	69.84	30.16	100
Total	-	92.48	-	30.86	111.94	43.22	155.16
%		81.60	-	18.40	72.14	27.86	100

Among different categories, marginal farmers reported highest area under irrigation though the total area was small, medium and large farmers had 73.38, 78.04 and 69.84 per cent area under irrigation respectively and that is too mostly by tube wells.

3.5 Cropping pattern of Farmers selected from non NFSM district Sehore

The information on average area (average of 2006-07 to 2008-09) allocated to different crops grown under different seasons by the farmers of Non NFSM district Sehore is given in the following tables.

The selected farmers of non NFSM district Sehore revealed that the cropping pattern was mostly based on soybean pulse & wheat pulses during kharif and rabi season respectively.

Soybean & wheat accounted for 40 per cent and 36.66 per cent of gross cultivated area respectively. The rest, 23.34 per cent area was under pulse crop (19.06 per cen)t and other crops(4.28 per cen)t together (Table 3.13).

Table 3.13: Cropping pattern-over all seasons: non-NFSM district Sehore

(Average of 2006-07, 2007-08, 2008-09**)**

	AREA SOWN				
	Soybean	**Wheat**	**Other major crops**	**Pulses**	**Total**
Marginal	6.02	4.92	0.87	1.84	13.65
Small	17.04	12.02	2.16	5.38	36.60
Medium	26.90	26.00	4.31	17.70	74.91
Large	70.00	67.00	5.51	32.25	174.76
Total	119.96	109.94	12.85	57.17	299.92
	PERCENTAGEOF TOTAL AREA SOWN				
	Soybean	**Wheat**	**Other major crops**	**Pulses**	**Total**
Marginal	44.10	36.04	6.38	13.48	100
Small	46.56	32.84	5.90	14.70	100
Medium	35.91	34.71	5.75	23.63	100
Large	40.05	38.34	3.16	18.45	100
Total	40.00	36.66	4.28	19.06	100

In kharif season soybean alone contributed 80.56 per cent to total net cultivated area leaving 15.04 per cent for pulses and 4.40 per cent for other crops only. The similar situation was also observed in rabi season where wheat alone accounted for 74.69 per cent of net cultivated area. Pulse also contributed significantly as 23.62 per cent area was covered by these crops. The other crops occupied very negligible area (1.69 per cent).

In summer season, some of the farmer had taken vegetable crops because of the availability of irrigation facilities (Table3.14).

Table 3.14 Cropping pattern season wise: non- NFSM district Sehore

(Average of 2006-07, 2007-08, 2008-09**)**

	KHARIF				
	Soybean	**Wheat**	**Other major crops**	**Pulses**	**Total**
Marginal	6.02	-	0.10	0.47	6.59
Small	17.04	-	0.76	1.03	18.83
Medium	26.90	-	2.06	8.45	37.41
Large	70.00	-	3.62	12.45	86.07
Total	119.96	-	6.54	22.40	148.90
	RABI				
	Rice	**Wheat**	**Other major crops**	**Pulses**	**Total**
Marginal	-	4.92	0.30	1.37	6.59
Small	-	12.02	0.48	4.35	16.85
Medium	-	26.00	0.77	9.25	36.01
Large	-	67.00	0.94	19.80	87.74
Total	-	109.94	2.49	34.77	147.20
	ZAID				
	Rice	**Wheat**	**Other major crops**	**Pulses**	**Total**
Marginal	-	-	0.47	-	0.47
Small	-	-	0.92	-	0.92
Medium	-	-	1.49	-	1.49
Large	-	-	0.94	-	0.94
Total	-	-	3.82	-	3.82

As for various categories of selected households, farmers belonging to different categories showed higher proportion of area allocation under pulse in rabi season compared to area allocated in kharif season. This might be because they preferred soybean crop over other crops

Thus soybean in kharif and wheat and pulses in Rabi were the major dominating crops in cropping pattern of the selected farmers.

3.6 Area under Pulses in NFSM and non NFSM districts
NFSM district, Vidisha

The triennium average (Average of 2006-07, 2007-08 and 2008-09) of different pulse crops during kharif and rabi season across various categories has been given in the following section.

In NFSM district Vidisha, the triennium average area under pulses was estimated at 68.71 hectares. Of this area 7.31 hectares (10.69%) in kharif and 61.40 (89.36%) hectares in Rabi season (Table 3.15).

Table 3.15 Area under pulses: NFSM, District Vidisha

(Average of 2006-07, 2007-08, 2008-09**)**

	Area sown (ha)				
	Arhar	**Urid**	**Gram**	**Lentil**	**Total**
Marginal	0.21	0.81	2.68	0.61	4.31
Small	0.19	1.20	4.00	0.60	5.99
Medium	1.80	1.10	16.00	2.80	20.70
Large	1.00	2.00	30.41	4.30	37.71
Total	2.20	5.11	53.09	8.31	68.71
Percentage					
Marginal	4.87	18.79	62.19	14.15	100.00
Small	3.17	20.03	66.78	10.02	100.00
Medium	3.86	5.31	77.30	13.53	100.00
Large	2.65	5.30	80.65	11.40	100.00
Total	3.20	7.44	77.27	12.09	100.00

Note : Total area in this table should match with that of previous tables.

The major pulse crops were tur and urid in kharif season and gram and lentil in rabi season. During kharif season, urid occupied 69.90 per cent in net sown area under pulses and the remaining 30.10 per cent was occupied by tur crop. In rabi season, gram was the major pulse crop which occupied 86.47 per cent area of the total pulse area in rabi season the rest 13.53 per cent area was occupied by lentil crop. Overall, gram was the only major pulse crop which accounted for 77.27 per cent of total pulse area. The other pulses lentil, urid and tur

occupied 12.09, 7.44 and 3.2 per cent area of gross cropped area under pulses(68.71 hectares) respectively during triennium year ending 2009 (Table 3.16).

Table 3.16 Area under pulses: NFSM district Vidisha

(Average of 2006-07, 2007-08, 2008-09**)**

Category	Kharif			Rabi		
	Arhar (ha.)	Urid (ha.)	Total	Gram(ha)	Lentil (ha.)	Total
Marginal	0.21	0.81	1.02	2.68	0.61	3.29
%	20.59	79.41	100.00	81.46	18.54	100.00
Small	0.19	1.20	1.39	4.00	0.60	4.60
%	13.67	86.33	100.00	86.96	13.04	100.00
Medium	1.80	1.10	1.90	16.00	2.80	18.80
%	42.11	57.89	100.00	85.11	14.89	100.00
Large	1.00	2.00	3.00	30.41	4.30	34.71
%	33.33	66.67	100.00	87.61	12.39	100.00
Total	2.20	5.11	7.31	53.09	8.31	61.40
	30.10	69.90	100.00	86.47	13.53	100.00

Among various categories of marginal small, medium and large farmers, gram occupied 62.32, 66.78, 77.30 and 87.31 per cent area of their gross area under pulse respectively. The next important pulse was lentil which accounted for 14.18, 10.02, 13.53 and 11.40 percentage area of their gross cropped area under pulses for marginal, small, medium and large farmers respectively.

3.6.1 Share of different size group in pulse farming: NFSM district Vidisha

The percent wise share of different category in pulse farming in NFSM district Vidisha revealed that the maximum share in pulse cultivation was of large farm category which was nearly 55 percent followed by medium(30.13%), small(8.72%) and marginal (6.27%). Thus area under pulses was more on large and medium farms as compared to marginal and small farms.

Table 3.17 Share of different size group in pulse farming: NFSM district Vidisha

	Total area under pulses (ha.)	% Share to total
Marginal	4.31	6.27
Small	5.99	8.72
Medium	20.70	30.13
Large	37.71	54.88
Total	68.71	100.00

Non NFSM district Sehore

In non NFSM district Sehore, the average area (average of 2006-09) under pulses was registered at 57.17 hectares of this 60.78% pulse area was in khaif and 39.22% was in rabi season (Table 3.18).

Table 3.18 Area under pulses: non NFSM district, Sehore

(Average of 2006-07, 2007-08, 2008-09**)**

Category	Kharif			Rabi		
	Tur (ha.)	Mung (ha.)	Total	Gram(ha)	Lentil (ha.)	Total
Marginal	0.47	--	0.47	1.03	0.34	1.37
%	100.00	--	100.00	75.18	24.82	100.00
Small	1.04	--	1.04	3.34	1.00	4.34
%	100.00	--	100.00	76.96	23.04	100.00
Medium	4.29	4.17	8.46	6.15	3.09	9.24
%	50.71	49.29	100.00	66.56	33.44	100.00
Large	6.45	6.00	12.45	16.00	3.80	19.80
%	51.81	48.19	100.00	80.80	19.20	100.00
Total	12.25	10.17	22.42	26.52	8.23	34.75
	54.64	45.36	100.00	76.32	23.68	100.00

In selected households of non NFSM district Sehore, tur and mung were the main pulses of kharif and gram and lentil were the main pulse crops of rabi season. These pulse crops together occupied 19.06 percentage area of the gross cropped area (GCA).

Among various categories, marginal small medium and large size farmer's allocated maximum area to gram as compared to moong tur and lentil and of the total area allocated to pulses, gram alone shared 55.98 percent, 62.17 percent, 34.74 and 49.60 per cent area for marginal, small, medium and large size households respectively.

3.7 Share of different size group in pulse farming: non NFSM district Sehore

The table 3.19 indicated that there was a direct relationship between share of different size group in pulse farming and it can be seen that as the land holding increases the share in pulse farming also increase. In the non NFSM district Sehore, the share of marginal, small, medium and large category in total area under pulses was estimated at 3.22 percent, 9.41percent, 30.96 percent and 56.41 per cent respectively.(Table 3.19)

Table 3.19 Share of different size group in pulse farming: non NFSM district Sehore

	Total area under pulses (ha.)	% Share to total
Marginal	1.84	3.22
Small	5.38	9.41
Medium	17.70	30.96
Large	32.25	56.41
Total	57.17	100.00

3.8 Irrigated area under pulse: NFSM and non NFSM district

As mentioned in the earlier table the selected farmers of both the districts the area under irrigation was very high and it was 80.25per cent in NFSM district Vidisha and 72.14 per cent in non NFSM district Sehore.

3.8.1 NFSM District Vidisha

In NFSM District Vidisha 61.69 per cent area of gram crop was irrigated whereas, lentil had 39.71 per cent area under irrigation in Rabi season overall, 55.23 per cent of the total area under pulse crops was irrigated. Category wise small farmers had highest irrigated area in gram crops (68.75%) whereas marginal farmers had highest irrigated area under lentil 49.18 per cent (Table 3.20)

Table 3.20: Percentage of irrigated area under pulses: NFSM district Vidisha

(AVERAGE OF 2006-07, 2007-08, 2008-09**)**

	Irrigated area				
	Arhar	Urid	Gram	Lentil	TOTAL
Marginal	--	0.20	1.00	0.30	1.50
Small	--	--	2.75	0.25	3.00
Medium	0.35	0.35	9.50	1.00	11.20
Large	0.50	0.50	19.50	1.75	22.25
Total	0.85	1.05	32.75	3.30	37.95
	Total area under the crops				
	Arhar	Urid	Gram	Lentil	TOTAL
Marginal	0.21	0.81	2.68	0.61	4.31
Small	0.19	1.20	4.00	0.60	5.99
Medium	0.80	1.10	16.00	2.80	20.70
Large	1.00	2.00	30.41	4.30	37.71
Total	2.20	5.11	53.09	8.31	68.71
	Percentage of irrigated area				
	Arhar	Urid	Gram	Lentil	TOTAL
Marginal	--	24.69	37.31	49.18	34.80
Small	--	--	68.75	41.66	50.08
Medium	43.75	31.82	59.37	35.71	54.11
Large	50.00	25.00	64.12	40.70	59.00
Total	38.63	20.55	61.69	39.71	55.23

The proportion of irrigated area to total sown area under pulses was estimated at 34.80 per cent for marginal, 50.08 per cent for small, 54.11 per cent for medium and 59.00 per cent for large farmers.

3.8.2 Crop wise share in irrigated area: NFSM Vidisha district

The proportion of irrigated area to gross irrigated area under different crops was estimated at 35.20 percent for wheat 12.18 percent for pulses and remaining 52.62 percent was under all other crops including soybean (table 3.21).

Table3.21: Crop wise share in irrigated area: NFSM Vidisha district

(Average of 2006-07, 2007-08, 2008-09**)**

	Area irrigated			
	Pulses	**Wheat**	**All other crops**	**Total GIA**
Marginal	1.50	4.47	7.84	13.81
Small	3.00	7.18	14.18	24.36
Medium	11.20	31.08	48.20	90.40
Large	22.25	66.96	93.61	182.82
Total	37.95	109.61	163.83	311.39
	Percentage of area irrigated			
	Pulses	**Wheat**	**All other crops**	**Total**
Marginal	10.86	32.37	56.77	100.00
Small	12.31	29.47	58.22	100.00
Medium	12.39	34.29	53.32	100.00
Large	12.17	36.63	51.20	100.00
Total	12.18	35.20	52.62	100.00

3.8.3 NFSM District Sehore

In Sehore, the table revealed that gram had the highest area under irrigation (41.25%) followed by lentil (36.33%) in rabi season. The other two pulse crops which were grown in kharif season, tur had 14.59 per cent irrigated area and mung had 38.19 per cent irrigated area.

Overall, 33.32 per cent area under pulse crops had irrigation facility. For different categories, small, medium and large had 30.11, 24.24 and 40.74 per cent area as irrigated. The farmers belonging to marginal category had no area as irrigated and all the pulses were under rain fed condition (Table 3.19)

Table3.22: Percentage of irrigated area under pulses: non NFSM, Sehore District

(AVERAGE OF 2006-07, 2007-08, 2008-09**)**

	Irrigated Area				
	Tur	**Mung**	**Gram**	**Lentil**	**Total**
Marginal	--	--	--	--	--
Small	--	--	1.00	0.44	1.62
Medium	--	1.04	2.25	1.00	4.29
Large	2.00	1.90	7.69	1.55	13.14
Total	2.08	3.12	10.94	2.99	19.05
	Total area under the crop				
	Tur	**Mung**	**Gram**	**Lentil**	**Total**
Marginal	0.47	0.00	1.03	0.34	1.84
Small	1.04	0.00	3.34	1.00	5.38
Medium	6.29	2.17	6.15	3.09	17.70
Large	6.45	6.00	16.00	3.80	32.25
Total	14.25	8.17	26.52	8.23	57.17
	Percentage of irrigated area				
	Tur	**Mung**	**Gram**	**Lentil**	**Total**
Marginal	--	--	--	--	--
Small	--	--	29.94	44.00	30.11
Medium	--	47.92	36.59	32.36	24.24
Large	31.00	31.66	48.06	40.79	40.74
Total	14.59	38.19	41.25	36.33	33.32

3.8.4 Crop wise share in irrigated area, non NFSM district, Sehore.

The proportion of irrigated area to total irrigated area under different crops was estimated at 43.00 per cent for wheat 8.80 per cent for pulses and remaining48.20 percent for other crops including soybean (Table 3.23)

Table3.23: Crop wise share in irrigated area: Non NFSM Sehore district

(Average of 2006-07, 2007-08, 2008-09**)**

	Area irrigated			
	Pulses	**Wheat**	**All other crops**	**Total GIA**
Marginal	--	4.44	5.04	9.48
Small	1.62	9.38	11.60	22.60
Medium	4.29	25.75	27.96	58.00
Large	13.14	53.42	59.64	126.20
Total	19.05	92.99	104.24	216.28
	Percentage of area irrigated			
	Pulses	**Wheat**	**All other crops**	**Total**
Marginal	--	46.83	53.17	100.00
Small	7.17	41.50	51.33	100.00
Medium	7.39	44.40	48.21	100.00
Large	10.41	42.33	47.26	100.00
Total	8.80	43.00	48.20	100.00

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CHAPTER IV

ECONOMICS OF PULSES CULTIVATION

In the fore going chapter economics of pulse production i.e. gross return total paid out cost, net return and value of marketed surplus in NFSM district Vidisha and Non NFSM district Sehore is analysed and discussed. A comparative analysis of profitability of pulses *viz-a-viz* other most competitor crops also attempted for all the categories of selected farmers with respect to three reference years viz. 2006-07, 2007-08 and 2008-09. The year 2006-07 and 2007-08 was pre initiation period and 2008-09 was post initiation period of National Food Security Mission (NFSM).

4.1 Economics of pulse crops in NFSM district, Vidisha

In Vidisha district the farmers selected for the study were found to cultivate not only pulse crops but other crops like soybean in kharif and wheat in Rabi in a large scale some of the farmers also took some minor crops for their own consumption, for example vegetable "Potato, tomato, lady finger (okra). Garlic and onion However, their area under there crops was very small and therefore their economics was not attempted.

4.1.1 Profitability of gram crop, NFSM district, Vidisha

In the cultivation of gram crop an increasing trend was observed across the board in terms of gross return per hectare and per quintal and net return per hectare and per quintal from 2006-07 to 2007-08 and from 2007-08 to 2008-09. The continuities increasing trend was mainly due to rising of the prices of pulse.

The average per hectare net return was estimated at Rs.15, 466 in the year 2006-07 which decrease to Rs.13, 665 in 2007-08 and again increased to Rs.21, 819 in the year 2008 - 09.

During 2008-09, the highest net return per hectare was obtained on large farms in Rs.22, 712 and lowest was obtained on marginal farms i.e. 17,972. As for net return per quintal the maximum was obtained on medium farmers Rs. 1,504 and lowest Rs. 1,345 on marginal farms in 2008-09.

The average value of marketed surplus was estimated at Rs.10, 87,275 in 2006-07, which slightly increased to Rs.11, 33,329 in 2007-08. The average value of marketable

surplus was estimated at Rs.18, 74,647 which indicated sharp increase over the previous years (Table 4.1).

Table 4.1 Profitability of gram farming, NFSM district, Vidisha.

Class	Gross Return	Total Paid Out Cost	Net Returns	Gross Returns /Ha	Net Returns /Ha	Gross Returns /Qtl	Net Returns /Qtl	Value of Marketed Surplus
Marginal								
2006-07	57893	23165	34728	23727	14233	2081	1248	39892
2007-08	56646	27118	29528	21787	11357	2126	1108	38760
2008-09	87991	34074	53917	29330	17972	2195	1345	68480
Small								
2006-07	77410	31809	45601	24891	14663	2109	1243	61196
2007-08	86607	41609	44998	22731	11810	2186	1136	67848
2008-09	171969	61956	110013	33852	21656	2242	1434	154696
Medium								
2006-07	365220	146957	218263	26013	15546	2186	1306	321151
2007-08	420362	176315	244047	26538	15407	2193	1273	374969
2008-09	618300	219433	398867	34123	22013	2329	1503	559820
Large								
2006-07	745516	300580	444936	26626	15891	2087	1245	665600
2007-08	743823	338787	405036	24663	13430	2183	1188	652496
2008-09	1188313	414530	773783	34879	22712	2310	1504	1092413
Total								
2006-07	1238544	502511	736033	26025	15466	2103	1250	1087275
2007-08	1299999	583829	716170	24804	13665	2171	1196	1133329
2008-09	2059437	729993	1315009	33931	21819	2281	1466	1874647

4.2 Profitability of lentil crop, NFSM district, Vidisha

Masoor or lentil was another important Rabi pulse crop and farmers grew it with wheat crop as a mix or mono crop as well. In NFSM district, the a significant number of farmers had cultivated this crop though the allocation of area was not very large but still the total area allocated for this crop was significant.

The study indicated that the average highest net return per hectare was 24,071 in 2006-07 which increased to Rs.2607 in 2007-08 and further increased to 2720 in 2008-09. (Table 4.2)

Table 4.2 Profitability of lentil farming, NFSM district Vidisha

Class	Gross return	Total paid out cost	Net returns	Gross returns /ha	net returns /ha	Gross returns /qtl	Net returns /rtl	Value of marketed surplus
Marginal								
2006-07	13223	3841	9382	30052	21322	2542	1804	9902
2007-08	17545	4835	12710	31900	23110	2591	1877	12651
2008-09	28016	7459	20557	33352	24472	2639	1936	23214
Small								
2006-07	13954	2443	11511	27361	22571	2506	2067	9758
2007-08	16682	2629	14053	30330	25550	2656	2237	12853
2008-09	24389	3619	20770	32958	28068	2660	2265	20716
Medium								
2006-07	77776	12987	64789	28806	23996	2542	2118	69162
2007-08	74821	13149	61672	27712	22842	2556	2107	67225
2008-09	96982	14772	82210	32327	27403	2665	2259	86130
Large								
2006-07	114795	18650	96145	29435	24653	2568	2151	97900
2007-08	134303	20604	113699	31601	26753	2607	2207	116840
2008-09	166392	23608	142784	35030	30060	2720	2334	148960
Total								
2006-07	219658	37921	181737	29094	24071	2553	2112	186612
2007-08	243389	41217	202172	30235	25115	2594	2155	209657
2008-09	315687	49457	266230	33836	28535	2690	2269	278876

4.3 Profitability of tur crop, NFSM district, Vidisha

The profitability of tur crop in presented in the table 4.3 indicated that average cost and return structure for tur crop different across various categories of selected farmers. The per hectare net return from tur crop cultivated for the average category of farmer was estimated at 12,978 in 2006-07 which declined eighthly to 12,122 in 2007-08 and again increased to 13,296 in 2008-09.

The average per quintal net return was estimated at Rs.1, 762 in 2006-07 Rs.1714 in 2007-08 and 1788 in 2008-09.

The table further revealed that only medium and large farmers sold tur crop in the marketed marginal and small farmers consumed total produce of tur crop either as home consumption or retained some quantity as seed for next year. On medium and large size farm the value of marketable surplus was estimated at Rs.28, 938 in 2006-07 which declined sharply to Rs. 23,479 in 2007-08. In 2008-09 the value again increased slightly to Rs.24, 028 (Table 4.3).

Table 4.3 Profitability of tur farming NFSM district, Vidisha

Class	Gross return	Total paid out cost	Net returns	Gross returns /ha	net returns /ha	Gross returns /qtl	Net returns /qtl	Value of marketed surplus
Marginal								
2006-07	3871	1482	2389	22770	14050	3028	1868	0
2007-08	4609	2436	2172	17725	8355	2887	1361	0
2008-09	4208	1918	2290	21039	11449	3023	1645	0
Small								
2006-07	2635	1106	1528	20267	11757	2937	1704	0
2007-08	5228	1973	3254	23762	14792	3046	1896	0
2008-09	4803	2064	2740	21833	12453	3075	1754	0
Medium								
2006-07	19501	8415	11086	20104	11429	2935	1668	11493
2007-08	15484	6494	8990	21506	12486	3008	1746	11714
2008-09	16048	6526	9522	22604	13412	3034	1800	11879
Large								
2006-07	27381	10596	16785	23205	14225	2967	1819	17453
2007-08	19739	8549	11190	21692	12297	3055	1732	11883
2008-09	21555	8976	12578	23686	13822	3113	1816	12145
Total								
2006-07	53397	21600	31797	21795	12978	2959	1762	28983
2007-08	45031	19453	25578	21342	12122	3018	1714	23479
2008-09	46609	19484	27125	22848	13296	3073	1788	24028

4.4 Profitability of urid crop, NFSM district, Vidisha

Urid crop is grown in kharif season this crop is a relatively new pulse crop as compared to other pulses and farmers have started cultivation of the crop due to higher market price and its study nature against weather. Moreover this crop can with study the water stress condition also.

The gross and net return per hectare and per quintal of average category of farmers showed an increasing trend over the period. The similar pattern can also be seen in different categories of marginal small medium and large farms also.

The average per hectare net return for all categories of farmers was estimated at Rs. 13478 in 2006-07 which increased to 18587 in 2007-08 and further increased to Rs. 21208. Similarly per quintal net return was estimated at Rs.2296 in 2006-07 Rs.2994 in 2007-08 and further increased to Rs.3242 in 2008-09. The shop increase in return was attributed mainly to the higher prices received by farmers of urid crop. (Table 4.4)

Table 4.4 Profitability of urid farming, NFSM district, Vidisha.

Class	Gross return	Total paid out cost	Net returns	Gross returns/ ha	net returns /ha	Gross returns /qtl	Net returns /qtl	Value of marketed surplus
Marginal								
2006-07	12375	3871	8505	22099	15187	3850	2646	11235
2007-08	17968	5381	12588	24281	17010	3961	2775	11553
2008-09	30527	8600	21926	27015	19404	4241	3046	26876
Small								
2006-07	16814	6686	10128	17887	10774	3480	2096	10130
2007-08	25476	7815	17661	24263	16820	4017	2785	17612
2008-09	46862	12233	34629	29107	21509	4377	3234	34161
Medium								
2006-07	16855	5206	11649	23410	16179	3941	2724	19168
2007-08	34735	9663	25071	26926	19435	4247	3065	16562
2008-09	35625	9925	25700	27616	19922	4447	3208	26056
Large								
2006-07	39778	12021	27757	24255	16925	3850	2687	41195
2007-08	56151	15761	40390	26738	19233	4285	3082	33455
2008-09	69490	17884	51606	30478	22634	4522	3358	52992
Total								
2006-07	79808	27784	52024	20676	13478	3523	2296	75169
2007-08	134903	38620	96283.02	26042.97	18587	4195	2994	79757
2008-09	182468	48643	133825	28917	21208	4420	3242	140206

4.5 Profitability of total pulses farming, NFSM district, Vidisha

The profitability from total pulse cultivation in NFSM district Vidisha has been given in table 4.5 the gross return on overall basis increased continuous; however the net return per hectare showed a different picture on the net return on 2007 – 08 was less though insignificant as compared to 2006 – 07. However, study revealed that during the 2008 – 09 the net return was much higher than the previous years this trend was also observed in net return per quintal

Overall basis net return per hectare was estimated as Rs. 26,119 in 200-07 Rs. 25,538 in 2007-08 and Rs. 33,502 in 2008-09. Also the net return per quintal in pulse cultivation came out to be Rs. 1,419 in 2006-07 Rs. 1,416 in 200 –08 and 1,648 in 2008-09. Hence the return on per hectare and per quintal basis increased during the 2008 – 09 over the previous years 2006-07 and 2007-08 (Table 4.5).

Table 4.5: Profitability of total pulses farming, NFSM district, Vidisha.

Class	Gross return	Net return	Gross return /ha.	Net Return /ha	Gross return /qtl	Net return /qtl	Value of marketed surplus
Marginal							
2006-07	87362	55003	24200	15236	2329	1466	61029
2007-08	96768	56998	23317	13735	2447	1441	62965
2008-09	150742	98690	29157	19089	2543	1665	118570
Small							
2006-07	110813	68769	23628	14663	2309	1433	81084
2007-08	133992	79965	23800	14203	2483	1482	98313
2008-09	248023	168152	32421	21981	2527	1713	209573
Medium							
2006-07	479352	305787	26009	16592	2298	1466	420974
2007-08	545402	339780	26540	16534	2328	1450	470470
2008-09	766955	516299	33173	22331	2434	1638	683885
Large							
2006-07	927471	585623	26713	16867	2200	1389	822148
2007-08	954016	570315	25495	15241	2316	1385	814674
2008-09	1445750	980752	34414	23346	2418	1640	1306510
Total							
2006-07	1604998	1015182	26119	16520	2243	1419	1385236
2007-08	1730178	1047059	25538	15455	2339	1416	1446421
2008-09	2611470	1763893	33502	22629	2439	1648	2318538

4.6 Profitability of other major crops, NFSM district, Vidisha

The profitability of other major crops has been given in table 4.6. In NFSM district Vidisha, the major crops other than the pulse during Kharif was soybean and in rabi it was wheat crop, the other crops were grown only marginally so profitability was attempted for soybean and wheat crops only.

4.6.1 Profitability of soybean crop, NFSM district, Vidisha

Over all the profitability of the soybean crop showed an increasing trend from 2006-07 to 2008-09 due to continuous support from the market and demand of the crop, on all the size group of sampled farmers a continuous increase in per hectare gross and net return was seen from 2006-07 to 2008-09. Net return on per quintal also registered on increasing trend during the period.

On overall basis, the gross return per hectare came out to be Rs 36,048, in 2006-07, Rs 38,874 in 2007-08, Rs 42,935 in 2008-09 and net return Rs 25,707, Rs 27,798 and Rs 31,144 for 2006-07, 2007-08 and 2008-09 respectively.

The net return per quintals also showed similar trends and it came out to be Rs 1,514 in 2006-07 Rs 1,580 inn 2007-08 and Rs 1,682 in 2008-09. (Table 4.6)

Table 4.6: Profitability of soybean crop, NFSM district, Vidisha

Class	Gross return	Total paid out costs	Net returns	Gross returns per ha	Net returns per ha	Gross returns per qtl	Net returns per qtl	Value of marketed surplus
Marginal								
2006-07	272243	87472	184771	36202	24571	2245	1524	245310
2007-08	227623	69089	158534	37315	25989	2226	1550	205860
2008-09	322088	95095	226993	40210	28338	2321	1636	285620
Small								
2006-07	415894	123075	292819	36968	26028	2200	1549	376536
2007-08	600138	181674	418464	36773	25641	2267	1580	544120
2008-09	741470	212949	528521	41608	29658	2349	1674	671060
Medium								
2006-07	1701882	497542	1204340	35731	25285	2126	1505	1546600
2007-08	1870323	553196	1317127	38326	26990	2200	1549	1687920
2008-09	2202729	618331	1584398	42303	30428	2332	1677	1999260
Large								
2006-07	3684859	1034680	2650179	36083	25951	2105	1514	3312000
2007-08	4440741	1229875	3210866	39501	28561	2207	1595	3989964
2008-09	5550951	1495105	4055846	43550	31820	2310	1688	4966040
Total								
2006-07	6074878	1742769	4332109	36048	25707	2123	1514	5480446
2007-08	7138823	2033834	5104989	38874	27798	2210	1580	6427864
2008-09	8817238	2421480	6395758	42935	31144	2319	1682	7921980

4.6.2 Profitability of wheat, NFSM district, Vidisha

In rabi season, wheat was a dominating crop and occupying majority share in cropping pattern of the selected farmers. In NFSM district Vidisha the profitability of wheat crop has been given table 4.7.

On overall basis the trends of gross return and net return per hectare and net return per quintal were similar to soybean because there crops are well established crops and more over the market support to wheat of Vidisha in well known the wheat of the Vidisha is highly in demand through the gross return per hectare out to be Rs 55,156 in 2006-07 to Rs 57,038 in 2007-08 and Rs 59,117 in 2008-09 similarly, the net return per hectare was Rs 40,629 in 2006-07 Rs 41,573 in 2007-08 and Rs 43,021 in 2008-09. Similarly, the net

return per quintal came out to be Rs 1,003 in 2006-07, Rs 1,016 in 2007-08 and Rs 1,097 in 2008-09 (Table 4.7.).

Table 4.7: Profitability of wheat crop, NFSM district, Vidisha

Class	Gross return	Total paid out costs	Net returns	Gross returns per ha	Net returns per ha	Gross returns per qtl	Net returns per qtl	Value of marketed surplus
Marginal								
2006-07	260250	69529	190721	52896	38764	52896	982	198774
2007-08	244524	67481	177043	53042	38404	53042	1007	174080
2008-09	265026	68481	196545	57992	43007	57992	1077	197345
Small								
2006-07	452709	127817	324892	49639	35624	49639	959	316008
2007-08	572204	167152	405052	51044	36133	51044	985	435276
2008-09	557177	139350	397827	55385	39545	55385	1026	418917
Medium								
2006-07	1893006	466756	1426250	58300	43925	58300	1078	1523856
2007-08	1451177	384737	1066440	57769	42453	57769	1024	1133965
2008-09	1855963	506787	1349176	59466	43229	59466	1105	1508052
Large								
2006-07	3424808	924292	2500516	54509	39798	54509	972	3107130
2007-08	3895129	1051614	2843515	58040	42370	58040	1018	3413404
2008-09	4942160	1340173	3601987	59501	43366	59501	1102	4265548
Total								
2006-07	6030773	1588394	4442379	55156	40629	55156	1003	5145768
2007-08	6163034	1670984	4492050	57038	41573	57038	1016	5156725
2008-09	7620326	2074791	5545535	59117	43021	59117	1097	6389862

4.7 Profitability of pulses crops in non – NFSM district Sehore.

4.7.1: Profitability of gram

Gram was the major pulse crop grown by the selected farmers of Sehore district and all the farmers have cultivated and allocated a significant area under this crop. The average category of sampled farmers of the district showed a net return from gram to the tune of Rs 13,114 in 2006-07, Rs 9066 in 2007-08 and Rs 20,597 in 200- 09. The average category of farmers showed a marginal decline in per quintal net return from Rs 1,189 in 2006-07 to Rs 1005 in 2007-08. However, the net return per quintal again rose to Rs 1,434 in 2008-09.

As far value of marketed surplus, the average farmers showed a value of marketed surplus of Rs 3,36,651 in 2006-07 which decreased to Rs 2,98,725 in 2007-08 but again

increased to Rs 6,17,353 in 2008-09. Thus, almost hundred per cent or more than that in marketed surplus was registered over the period (Table 4.8).

Table 4.8: Profitability of gram in non – NFSM district Sehore:

Class	Gross return	Total paid out cost	Net returns	Gross returns /ha	Net returns /ha	Gross returns /qtl	Net returns /qtl	Value of marketed surplus
Marginal								
2006-07	22466	14652	7814	20424	7104	2431	846	12960
2007-08	19125	12267	6858	21983	7883	2443	876	11200
2008-09	34739	16352	18387	31017	16417	2481	1313	15470
Small								
2006-07	64244	34739	29505	25095	11525	2574	1182	31360
2007-08	65354	44177	21177	20682	6702	2585	838	32850
2008-09	129740	63984	65756	30172	15292	2339	1185	65100
Medium								
2006-07	197633	106896	90737	24922	11442	2443	1122	105831
2007-08	136413	76822	59591	25215	11015	2522	1102	65105
2008-09	187312	75986	111326	36656	21786	2365	1406	107054
Large								
2006-07	377454	181201	196254	28726	14936	2394	1245	186180
2007-08	378186	232661	145525	23244	8944	2612	1005	189847
2008-09	683354	278664	404689	36759	21769	2535	1501	430909
Total								
2006-07	661804	337488	324316	26761	13114	2426	1189	336651
2007-08	599013	365927	233086	23299	9066	2582	1005	298725
2008-09	1034763	434986	599777	35534	20597	2474	1434	617353

4.7.2: Profitability of lentil in non – NFSM district Sehore:

The selected farmers of non–NFSM district registered relatively lower return from lentil crop cultivated during Rabi season. Since per hectare return from lentil crop was Rs 12,876 in 2006-07, Rs 15,447 in 2007-08 and Rs 18,294 in 2008-09. However, the net return per quintal was Rs 1896 in 200- 07, Rs 1,991 in 2007-08 and Rs 2080 in 2008-09.

It can also be seen from the table that over the period an increasing trend was noted in the value of marketable surplus increased from Rs 75,757 in 2006-07 to Rs 15, 7374 in 2008-09. This registered an increase of 107 per cent growth over 2006 – 07 (Table 4.9).

Table 4.9: Profitability of lentil in non – NFSM district Sehore:

Class	Gross return	Total paid out cost	Net returns	Gross returns /ha	net returns /ha	Gross returns /qtl	Net returns /qtl	Value of marketed surplus
Marginal								
2006-07	3695	1026	2669	17598	12712	2514	1816	0
2007-08	9315	2218	7097	20699	15770	2524	1923	0
2008-09	7467	1796	5671	20741	15752	2593	1969	0
Small								
2006-07	21951	6298	15653	17149	12229	2638	1881	15120
2007-08	17880	4411	13469	20552	15481	2569	1935	9760
2008-09	17887	4403	13484	21043	15863	2715	2047	10354
Medium								
2006-07	40715	10458	30257	19115	14205	2549	1894	27048
2007-08	74531	18621	55910	20253	15193	2700	2026	59340
2008-09	83575	18027	65548	24155	18944	2684	2105	64750
Large								
2006-07	52498	15322	37176	17269	12229	2698	1911	33530
2007-08	78058	19213	58845	20760	15650	2628	1981	52720
2008-09	108896	24012	84884	23673	18453	2660	2073	82240
Total								
2006-07	118859	33104	85755	17847	12876	2628	1896	75757
2007-08	179783	44463	135320	20523	15447	2646	1991	121354
2008-09	217824	48238	169586	23498	18294	2671	2080	157374

4.7.3: Profitability of tur in non – NFSM district Sehore:

The per hectare net return from Tur crop for the average category of farmers belonging to Sehore district was established Rs 8817 in 2006 – 07, Rs 9181 in 2007 – 08 and in 2008 – 09. The per hectare net return registered a decline over 2007 – 08 and it was established at Rs 8936. The average net return per quintal also registered the same trend and it was Rs 1523 in 2006 – 07, Rs 1544 in 2007 – 08 and Rs 1459 in 2008 – 09.

The value of per hectare marketed surplus was found to increase from 156494 in 2006-07 to 1, 57,857 in 2007-08. However, during 2008–09 the value of marketable surplus registered a significant increase over 2006-07 and 2007-08 and it was estimated at Rs 2, 21,700 (Table 4.10).

Table 4.10: Profitability of tur in non – NFSM district Sehore:

Class	Gross return	Total paid out cost	Net returns	Gross returns /ha	net returns /qtl	Gross returns /qtl	Net returns /qtl	Value of marketed surplus
Marginal								
2006-07	6297	3336	2960	16571	7791	3013	1416	0
2007-08	9787	4898	4888	18821	9401	2896	1446	0
2008-09	9952	4911	5041	19514	9884	3002	1521	0
Small								
2006-07	22987	9933	13053	19647	11157	3023	1716	0
2007-08	18408	8197	10210	20008	11098	3078	1707	0
2008-09	16367	9775	6592	15890	6400	2943	1185	0
Medium								
2006-07	77012	54887	22125	12109	3479	3027	870	43650
2007-08	110970	51135	59835	19781	10666	3043	1641	68525
2008-09	121564	63252	58312	17618	8451	2936	1409	74620
Large								
2006-07	176896	73432	103464	21705	12695	3057	1788	113605
2007-08	152343	82125	70218	17391	8016	3162	1457	89320
2008-09	219928	112226	107702	19225	9415	3076	1506	147490
Total								
2006-07	283191	141588	141603	17633	8817	3045	1523	156494
2007-08	291508	146356	145152	18438	9181	3101	1544	157857
2008-09	367811	190165	177647	18502	8936	3020	1459	221700

4.8: Profitability of mung in non – NFSM district Sehore:

The profitability of mung crop has been given in table 4.11, on overall basis; gross return showed a decline in 2007 – 08 over the year 2006 – 07. However, this again increased significantly in 2008 – 09.

The net return per hectare showed a decline in 2007 – 08 over the net return of 2006 – 07. However, this increased again in 2008 – 09. The table farther showed that net return per quintal showed a significant decline in 2007 – 08 and 2008 – 09 over the period of 2006 – 07 (Table 4.11).

Table 4.11: Profitability of mung in non – NFSM district Sehore:

Class	Gross return	Total paid out cost	Net returns	Gross returns /ha	net returns /ha	Gross returns /qtl	Net Returns /qtl	Value of marketed surplus
Marginal								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Small								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Medium								
2006-07	37418	18739	18679	18432	9201	4496	2244	21613
2007-08	39387	25437	13950	17200	6092	4587	1624	22059
2008-09	41296	26258	15038	18857	6867	4714	1717	18128
Large								
2006-07	57200	31828	25372	18101	8029	4525	2007	30590
2007-08	51418	29290	22128	18698	8047	4674	2012	26910
2008-09	65161	37197	27963	21088	9050	4686	2011	36137
Total								
2006-07	94618	50566	44051	491065	8488	4514	2101	52213
2007-08	90806	54728	36078	457661	7158	4636	1842	49060
2008-09	106457	63456	43002	562093	8144	4697	1897	54277

4.9: Profitability of total pulses farming, non - NFSM district, Sehore.

The profitability from total pulses calculation in Non – NFSM district Sehore has been given in Table 4.12. the table revealed that on over all basis the gross return per hectare was Rs 22007 in 2006 – 07 which decreased to Rs 20989 and also increased Rs 27173 in 2008 – 09, Similarly, the net return per hectare was Rs 11,317 in 2006 – 07 which again decreased to Rs 9936 in 2007 – 08 and again increased to Rs 15578 in 2008 – 09. The same trend was also seen in the case of net return per quintal, which the return was Rs 1379 in 2006 – 07 which marginally decreased to Rs 1329 in 2007 – 08 and again increased substantially to Rs 1537 in 2008 – 09. However, a different situation has been observed in case of gross return per quintal which registered an a increasing trend from 2006 – 07 to 2007 – 08 and than decreased in 2008 – 09. Overall, total profitability of pulses increased during 2008 – 09 over the period of 2006 – 07 and 2007 – 08.

Table 4.12: Profitability of total pulses farming, non – NFSM district, Sehore.

Class	Gross return	Total paid out cost	Net return	Gross return (Rs/ha)	Gross return per qt.	Net return per ha	Net return per qt.	Value of marketed surplus
Marginal								
2006-07	32459	19014	13444	19206	2536	7955	1050	12960
2007-08	38227	19383	18843	20775	2566	10241	1265	11200
2008-09	52158	23059	29099	26210	2583	14623	1441	15470
Small								
2006-07	109181	50971	58211	21793	2670	11619	1424	46480
2007-08	101641	56785	44856	20534	2659	9062	1174	42610
2008-09	163993	78162	85832	26536	2425	13889	1269	75454
Medium								
2006-07	352778	190980	161798	19121	2701	8770	1239	198142
2007-08	361302	172015	189286	21266	2850	11141	1493	215029
2008-09	433747	183523	250224	24561	2702	14169	1559	264552
Large								
2006-07	664048	301782	362266	24156	2681	13178	1463	363905
2007-08	660006	363289	296717	20926	2824	9408	1270	358797
2008-09	1077338	452100	625238	28561	2721	16576	1579	696776
Total								
2006-07	1158472	562747	595725	22007	2682	11317	1379	621487
2007-08	1161110	611473	549637	20989	2808	9936	1329	627636
2008-09	1726855	736844	990011	27173	2681	15578	1537	1052252

4.10: Profitability of major crops, non – NFSM district, Sehore.

In non – NFSM district Sehore the major crops during Kharif and rabi season were soybean and wheat respectively and the cropping pattern of the selected sampled farmers also depend on these two crops. The profitability of these crops has been presented in table 4.13 and 4.14.

4.10.1: Profitability of soybean crops, non – NFSM district, Sehore.

The profitability of soybean farmers is revealed that farmers witnessed stagnation in soybean farming. On overall basis, the gross return per hectare decline in the year 2007 – 08 and 2008 – 09 over the gross return received in the year of 2006 – 07, on all the farm size category the gross return per hectare was Rs 40043 in 2006 – 07, Rs 39500 in 2007 – 08 and Rs 30721 in 2008 – 09. The net return per hectare was Rs 28,332 in 2006 – 07 which declined to Rs 26981 in 2007 – 08 and Rs 26, 549 in 2008 – 09. As far net return per quintal basis the farmers received almost same amount in 2006 – 07 and 2007 – 08 which further declined to Rs 1526 in 2008 – 09.(Table 4.13)

Table 4.13: Profitability of soybean crops, non – NFSM district, Sehore.

Category	Gross return	Total paid out Cost	Net returns	Gross returns /ha	net returns /ha	Gross returns /qtl	Net returns /qtl	Value of marketed surplus
Marginal								
2006-07	147603	48882	98721	34894	23338	2170	1451	128400
2007-08	257730	82391	175339	38126	25861	2210	1503	239800
2008-09	274405	90339	184066	38923	26108	2310	1550	250800
Small								
2006-07	856759	269807	586952	37826	25914	2199	1507	792050
2007-08	591968	203181	388787	36206	23779	2270	1491	560000
2008-09	479505	159208	320297	39653	26427	2288	1528	440700
Medium								
2006-07	936421	309393	627028	35823	23987	2140	1433	886200
2007-08	1027363	297472	729891	42594	30261	2290	1627	971800
2008-09	1211024	403086	807938	39784	26524	2305	1538	1041950
Large								
2006-07	3212760	931038	2281722	40104	28428	2245	1596	3034550
2007-08	2384605	767642	1616963	39324	26665	2320	1573	2232750
2008-09	2728948	912992	1815956	39407	26223	2270	1510	2576000
Total								
2006-07	5330898	1559120	3771778	40043	28332	2216	1568	4841990
2007-08	2461666	1350686	2910980	39500	26981	2299	1570	4003020
2008-09	4721273	1565625	3155648	39721	26549	2283	1526	4309989

4.10.2: Profitability of wheat crops, non – NFSM district, Sehore.

On an over all basis, gross return per hectare, net return per hectare and net return per quintal has registered an increasing trend over the years. The gross return per hectare came out to be Rs 46, 346 in 2006 – 07, Rs 49559 in 2007 – 08 and Rs 50, 394 in 2008 – 09. The net return per hectare came out to be Rs 31, 893 in 2006 – 07 Rs 34, 049 in 2007 – 08 and Rs 34433 in 2008 – 09. Similar trend was also observed in net return per quintal and this came out to be Rs 808 in 2006 – 07, Rs 850 in 2007 – 08 and Rs 895 in 2008 – 09 this trend was also observed by the medium and large size farmers, where as the marginal farmers observed as decline in 2007 – 08 (Table 4.14).

Table 4.14: Profitability of wheat crops, non – NFSM district, Sehore.

Class	Gross return	Total paid out cost	Net returns	Gross returns /ha	Net returns /ha	Gross returns /qtl	Net returns /qtl	Value of marketed surplus
Marginal								
2006-07	263411	79901	183510	46375	32308	1196	833	1,96,560
2007-08	213357	72718	140639	43365	28585	1225	807	1,44,480
2008-09	222821	62026	160795	53563	38653	1290	931	1,45,755
Small								
2006-07	480070	143117	336953	47438	33296	1183	830	3,54,795
2007-08	563944	203564	360380	41528	26538	1210	773	4,33,160
2008-09	591860	195041	396819	47885	32105	1280	858	4,51,200
Medium								
2006-07	1162035	347700	814335	47761	33470	1215	851	9,27,960
2007-08	1395764	429841	965923	49425	34204	1244	861	11,30,880
2008-09	1285781	409703	876078	50562	34451	1325	902	10,35,780
Large								
2006-07	2661471	853487	1807984	45565	30953	1153	783	22,50,560
2007-08	3588686	1097026	2491660	51621	35841	1240	861	31,07,630
2008-09	3695822	1168974	2526848	50579	34581	1309	896	32,20,965
Total								
2006-07	4566987	1424205	3142782	46346	31893	1174	808	37,29,875
2007-08	5761751	1803149	3958602	49559	34049	1238	850	48,16,150
2008-09	5796284	1835744	3960540	50394	34433	1309	895	48,53,700

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CHAPTER V

TECHNOLOGY ADOPTION, MARKETING AND OTHER ISSUES

This chapter deals with the response of the selected farmers towards their knowledge of improved varieties, area under pulses, production technologies, source of knowledge, the problem arises during the production and suggestion to overcome the problem.

In the next part, marketing aspects in general and existing marketing channels and extent of govt. intervention in particular were discussed. Thus, the major focus of this chapter is, therefore, on pulse growing technologies adopted and marketing of their crops through various channels by sampled farmers of the NFSM district Vidisha and non NFSM district Sehore.

The districts selected for the study were predominantly gram growing which was growing for commercial purpose. Whereas other pulses like mung, tur and urid were growing basically for home consumption.

5.1 Area under improved varieties of pulses in NFSM & non NFSM districts

The response of selected farmers of both Vidisha and Sehore district with respect to allocation of area under improved & traditional varieties of pulse crops presented in the table 5.1, and 5.2.

In NFSM district Vidisha, Arhar or tur crop was mainly grown for household consumption and most of the farmers (80%) grew traditional varieties but the preference for varieties for other pulses was entirely different as 100 per cent farmers of urid crops 81.25percent of gram crops and 75percent sampled farmers of lentil crop in reported area under improved varieties (Table 5.1).

Study further revealed that area under improved varieties of tur crops as proportion to total area under that particular crop was 38.64 per cent. As far urid crop the entire area under this crop was covered by improved varieties and none of the farmer reported any local variety of urid crops. The proportion under improved verities to total area of that crop with respect to gram was 77.27 per cent as some of the selected farmers still prefer local or *deshi* gram over improved one. Lentil was another pulse crop with reported area under improved varieties was 81.95 per cent.

The above information clearly indicate that farmers of NFSM district Vidisha had preferred improved varieties of all the pulse per cent tur despite some problems in their cultivation.

Table 5.1 Households reporting area under improved varieties and total area under improved varieties (2008-09) NFSM District Vidisha

Pulse crop	No. of Holds reporting area under improved varieties	Total No. of Households growing pulse	% of Households reporting area under improved varieties	Total area under the crop (Ha.)	Area under traditional variety (Ha.)	Area under improved variety (Ha.)	Percentage of area under improve varieties
Arhar	02	10	20	2.20	1.35	0.85	38.64
Urid	17	17	100.00	5.11	0	5.11	100.00
Gram	39	48	81.25	53.41	11.82	41.27	77.27
Lentil	15	20	75.00	8.31	1.50	6.81	81.95
Total	73	95	76.84	69.03	14.67	54.04	78.28

5.2 Source of knowledge of improved varieties

Table revealed that all the farmers of the district selected under NFSM study were well aware of the improved varieties available to them. This might be because the districts selected were agriculture development (Table5.2).

Table 5.2 Knowledge of improved varieties: NFSM district Vidisha

Category	Number of farmers aware of improved varieties	Total number of farmers in the size groups	% of farmers aware of improved varieties
Marginal	10	10	100.00
Small	11	11	100.00
Medium	16	16	100.00
Large	13	13	100.00
Total	50	50	100.00

The major source of knowledge regarding improved varieties of pulse crops were extension agents of State department agencies working in the area, neighbor, paper or other media and other source. It can be seen from the table that extension agents of State agricultural Department have done a great job in dissemination of knowledge and 54 per cent of all size group farmers 'received knowledge of improved varieties from this source. Another 32 per cent got information from different sources of media like new papers, radio talk and T.V. advertisement category wise also (table 5.3).

Table 5.3 Source of knowledge of improved varieties; NFSM district

(Number)

Category	Extension agent		Neighbors		Newspaper/ media		Others		Total
Marginal	6	60.00	2	20.00	2	20.00	-	10.0	100
Small	6	54.55	1	9.09	3	27.27	1	9.09	100
Medium	7	43.75	1	6.25	6	37.50	2	12.50	100
Large	8	61.54	-	-	5	38.46	-	-	100
Total	27	54.00	4	8.00	16	32.00	3	6.00	100

It was extension worker which provided the knowledge of improved varieties to the farmers irrespective of size of farms, 60 per cent of marginal size group farmers got knowledge of improved varieties from extension agents. Other 20 per cent each got this knowledge from neighbor and media. In small size the extension workers provided this knowledge to 54.55 per cent farmers followed by media 27.27. Neighbors and other sources contributed 9.09 per cent each. On medium farmers the 43.75 per cent farmer came to know about improved varieties from extension workers. Media contributed 37.50 per cent other and neighbor contributed 12.50 and 6.25 per cent respectively on larger size farms the major source of knowledge about improved variation was again extension workers working in the villages and 61.54 per cent farmers received information from them the remaining was contributed by newspapers and other media.

5.3 Adoption of recommended practices for improved varieties of pulses in NFSM, Vidisha district

The study revealed that all the selected farmers of Vidisha district were well aware of cultivation practices recommend for that pulse crop whether it was for sowing practices, land preparation practices or any other practices recommended either by scientists or by extension workers;

5.3.1 Recommended practices: NFSM district Vidisha

Over all 98 per cent farmers adopted sowing practices as per the recommendations. The percentage of farmers who had adopted practices was also very high as 70 per cent farmers reported that they follow the recommendation. The percentage of adoption of other cultivation practices like application of fertilizers, manures use of organic manners pest/ plant protection measures etc. was also very high and 66 per cent farmers followed their practices. The study also revealed that as for sowing practices were concern the proportion of farmers following the recommend practices increased with the increase in land holding and it ranged between 60 per cent in marginal farms to 84.62 per cent in large size farms. The similar trend can also be seen for other practices also (table 5.4).

Table 5.4 Recommended practices in NFSM district, Vidisha **(number)**

Categories	Followed some practice						Not followed any practice
	Sowing practice		Seed practice		Others		
	No.	%	No.	%	No.	%	
Marginal	6	60.00	10	100.00	5	50.00	0
Small	8	72.73	11	100.00	7	63.63	0
Medium	12	75.00	15	93.75	12	75.00	0
Large	11	84.62	13	100.00	9	61.82	0
Total	37	74.00	49	98.00	33	66.0	0

Figures given in parenthesis are percentage to total

5.3.2 Recommended practices in non NFSM district Sehore

The adoption of recommend practices regarding seed sowing and other cultivation provides like adoption of proper dozes of plant protection chemicals, weed control etc. has been given in the (table 5.5).

Table 5.5: Recommended practices: non NFSM District Sehore

Category	Followed some practices						Not followed any practice
	Sowing practices		Seed practice		Others		
	No.	%	No.	%	No.	%	
Marginal	6	60.00	8	80.00	6	60.00	--
Small	8	61.54	13	100.00	8	61.54	--
Medium	11	73.33	15	100.00	10	66.66	--
Large	10	83.33	12	100.00	9	75.00	--
Total	35	70.00	48	96.00	34	68.00	--

Figures given in parenthesis are percentage to total

The table 5.5 showed that each of the selected farmers had followed one or other practices recommended for the cultivation of pulses and the percentage of farmers following sowing practices was as high as 96 per cent. As for adoption of seed practices this percentage was also significantly high and 70 per cent farmers reported that they followed the recommendations. Regarding other recommended practices, 68 per cent farmers followed the various recommendations.

Like NFSM district Vidisha none of the farmer of this district reported that they did not follow any recommended practices.

It can be concluded from the result that farmers of both the district were following the package of practices, however, the proportion in NFSM Vidisha district was little higher as compared to that of non NFSM district Sehore.

5.3.3 Area under improved varieties in non NFSM district Sehore

The area under improved varieties of different pulses grown in NFSM and non NFSM district has been given in table5.6

The table revealed that improved varieties reported by selected farmers that nearly 70 percent area of total pulses was covered by improved varieties. Crop wise data showed that 86.49 percent area of gram, 85.75 percent area of lentil and 66.66 percent area were under improved varieties. In the case of tur crop the area under improved varieties was comparatively less as on 41.38 percent area was under improved varieties (Table 5.6).

Table 5.6 Households reporting area under improved varieties and total area under improved varieties non NFSM District Sehore, 2008-09

Pulse crop	No. of Holds reporting area under improved varieties	Total No. of Households growing pulse	% of Households reporting area under improved varieties	Total area under the crop (ha.)	Area under traditional varieties (ha.)	Area under improved varieties (ha.)	Percentage of area under improve varieties
Tur	12	29	41.38	17.25	6.57	10.68	61.91
Mung	6	9	66.66	5.17	2.17	3.00	58.03
Gram	32	37	86.49	26.52	5.03	21.49	81.03
Lentil	12	14	85.75	8.23	1.14	7.09	86.15
Total	62	89	69.66	57.17	14.91	42.26	73.92

Figures given in parenthesis are percentage to total

5.3.4 Source of knowledge of improved varieties, non NFSM district, Sehore.

In the case of non NFSM district Sehore, all the farmers selected for study were well aware of the improved varieties none of thereon reported any ignorance about improved varieties. However, it is very interesting to note that despite the awareness and knowledge of the importance of improved varieties of the pulses some of the farmers still not using them because of the various reasons like untimely availability of seeds, lower than expected yield, higher cost of cultivation and incidences of pest and diseases (Table 5.7).

Table 5.7 Knowledge of improved varieties Non-NFSM district Sehore

Category	No. of Farmers aware of improved varieties	Total No. of Farmers in the size group	Percentage of Farmers aware of improved varieties.
Marginal	10	10	100.00
Small	13	13	100.00
Medium	15	15	100.00
Large	12	12	100.00
Total	50	50	100.00

The major sources of knowledge about improved varieties were extension workers, neighbor, friends' media and field workers of different seed companies. In Sehore district 54 per cent farmers received knowledge about improved varieties from extension agents, 18 per cent by newspaper and T.V. 16 per cent by other sources and 12 per cent sampled farmers acquired it from their neighbor i.e. either farm or house neighbor. The proportion of farmers received knowledge from extension agent increased with the increase in the size of holdings except in the case of medium farms. In the case of marginal farmers media like newspapers or T.V. played no role in providing knowledge about improved varieties (Table5.8).

Table 5.8 Source of knowledge of improved varieties: non NFSM district Sehore

Category	Extension Agent		Neighbors		Newspaper/ Media		Others		Total	
Marginal	5	50.00	3	30.00	--	--	2	20.00	10	100.00
Small	7	53.85	2	15.38	3	23.08	1	7.69	13	100.00
Medium	7	46.67	1	6.66	4	26.67	3	20.00	15	100.00
Large	8	66.60	--	--	2	16.66	2	16.66	12	100.00
Total	27	54.00	6	12.00	9	18.00	8	16.00	50	100.00

Figures given in parenthesis are percentage to total

5.4 Problems with improved varieties

The response of selected pulse growing farmers belonging and NFSM district Vidisha and non NFSM district Sehore were recorded in term of various problems faced by them eg. From 1 to 6 and the reported response were given in the following table.

NFSM District Vidisha

Tur

It has been observed that most of the farmers faced two major problems as rank I while cultivation of tur crop. Of this, fifty per cent of the farmers reported that yield of the crop was much lower than the expectation. The other forty per cent farmers reported that the required seed was not available on time.

In the category of second most important problem (rank 2) with improved varieties, forty per cent farmers reported improved seed varieties of the mung crop was available but not on time which again a large number (30 per cent) ranked other problem of lower yield than expected as ranked 2. Twenty per cent farmers felt that this crop needs large doses of other inputs and ranked it as II.

In the 3rd most important rank, sixty per cent of the farmers reported that untimely availability of improved varieties of seed affected the production of the mung crop.

Most of the farmers reported unavailability of pests and disease resistance varieties as least faced problem as far as mung crop is concerned.(Table5.9)

Table 5.9 Households reporting problems with improved varieties of tur, NFSM district, Vidisha

Problem	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	TOTAL
Not available at all	1 (10)	--	--	--	--	9 (90)	10 (100.00)
Available but not in time	4 (40)	4 (40)	1 (10)	1 (10)	--	--	10 (100)
Very Expensive	--	1 (10)	6 (60)	2 (20)	1 (10)	--	10 (100.00)
Need Large Doses of Other Inputs	5 (50)	3 (30)	2 (20)	--	--	--	10 (100)
Much lower yield than expected	--	2 (20)	1 (10)	4 (40)	2 (20)	1 (10)	10 (100.00)
Pest resistance not adequate	--	--	--	3 (30)	7 (70)	--	10 (100)
Total	10	10	10	10	10	10	10 (100.00)

Figures given in parenthesis are percentage to total

Gram

It is to be noted from table 5.10 that unavailability of pest resistant varieties of gram crop was major single problem and 38.78 per cent farmers ranked this problem as number 1 or most important problem. The much lower yield than expected was reported as rank 1 by 30.61 per cent farmer. A significant number of farmers were also opined that improved varieties of gram need large doses of other inputs like fertilizer/ chemicals etc.

In rank 2 category, it was again the problem of resistance not adequate received higher note and 38.78 per cent farmer noted in the favor of this problem followed by seed long dose of other inputs (28.57%) and much lower yield that expected (26.53%).

Table 5.10 Households reporting problems with improved varieties of gram: NFSM District, Vidisha

Problem	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	TOTAL
Not available at all	--	--	1 (2.04)	3 (6.12)	6 (12.24)	39 (79.60)	10 (100)
Available but not in time	5 (10.20)	1 (2.04)	6 (12.24)	13 (26.53)	20 (40.82)	4 (8.12)	10 (100)
Very Expensive	2 (4.08)	2 (4.08)	4 (8.17)	16 (32.85)	19 (38.78)	6 (12.24)	10 (100)
Need Large Doses of Other Inputs	8 (16.32)	14 (28.57)	21 (42.86)	4 (8.13)	2 (4.08)	--	10 (100)
Much lower yield than expected	15 (30.61)	13 (26.53)	12 (24.49)	7 (14.29)	2 (4.08)	-	10 (100)
Pest resistance not adequate	19 (38.78)	19 (38.78)	5 (10.20)	6 (12.24)	--	--	10 (100)
Total	49	49	49	49	49	49	10 (100)

Figures given in parenthesis are percentage to total

The 3rd most important problem was that the gram need higher doses of inputs and as high as 42.86 per cent farmers, noted this problem as the 3rd most important problem followed by much lower yield than expected (24.49%) and ultimately availability with 12.24 per cent opined that not availability at all was not the major problem and almost all the farmers ranked it as last important among all the problem i.e. 6th important problem.

Lentil

The above table indicated that of the 50 farmers who grew pulses 20 had also taken lentil crop during 2008-09 and of these 20 lentil farmers, a significantly large percentage of farmers (60%) reported pest resistance not adequate of improved variety as the most important problem and 30 per cent mentioned a much lower yield than expected as major problem

Table 5.11 Households reporting problems with improved varieties of lentil: NFSM District, Vidisha

Problem	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--		3 (15)	17 (85)	10 (100)
Available but not in time	--	--	--		13 (65)	3 (15)	10 (100)
Very Expensive	--	--	4	12	4	--	10
			(20)	(60)	(20)		(100)
Need Large Doses of Other Inputs	2 (10)	3 (15)	11 (55)	4 (20)	--	--	10 (100)
Much lower yield than expected	6 (30)	11 (55)	3 (15)	--	--	--	10 (100)
Pest resistance not adequate	12 (60)	6 (30)	2 (10)	--	--	--	10 (100)
Total	20	20	20	20	20	20	100 (100)

Figures given in parenthesis are percentage to total

The above table indicated that of the 50 farmers who grew pulses 20 had also taken lentil crop during 2008-09 and of these 20 lentil farmers a significantly large percentage of farmers (60%) reported pest resistance not adequate of improved variety as the most important problem and 30 per cent mentioned a much lower yield than expected as major problem. As far as second most important problem is concern 55 per cent farmers found much lower yield than expected followed by pest resistance not adequate (60%) given 2nd ranking. It can be seen that availability was not a major problem and this problem did not find place in first four important places and not available on time and not available at all were the problems reported as 5th with 65 per cent and 6th with 85 per cent respectively.

Table 5.12 Households reporting problems with improved varieties of pulses urid NFSM District, Vidisha

Problem	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	TOTAL
Not available at all	--	--	--	--	2 (11.77)	15 (88.23)	17 (100)
Available but not in time	1 (5.88)	6 (35.30)	3 (17.64)	6 (35.30)	1 (5.88)	--	17 (100)
Very Expensive	1 (5.88)	1 (5.88)	4 (23.53)	4 (23.53)	5 (29.41)	2 (11.77)	17 (100)
Need Large Doses of Other Inputs	4 (23.53)	4 (23.53)	6 (35.29)	2 (11.77)	1 (5.88)	--	17 (100)
Much lower yield than expected	11 (64.70	5 (29.41)	--	1 (5.88)	--	--	17 (100)
Pest resistance not adequate	--	1 (5.88)	4 (23.53)	4 (23.53)	8 (47.06)	--	17 (100)
Total	17	17	17	17	17	17	17 (100)

Figures given in parenthesis are percentage to total

In Vidisha district urid was the 3rd major pulse crop after, gram and lentil and 17 out of 50 selected farmers had this crop in their cropping pattern during 2008-09. Table 5.4 revealed that in the cultivation of urid crop the problem relating to much lower yield than expected was assigned 64.72 per cent households followed by need large doses of other inputs with 23.53 per cent as 1st ranking. The second most important ranking was assigned to availability but not in time, by 35.30 per cent followed by much lower yield then expected by 29.41 per cent and large doses of other inputs 23 53 per cent. Similarly, at the 3rd ranking 35.29 per cent farmers reported that improved varieties of this crop need large doses of other inputs followed by expensive nature of improved varieties and pest resistance not adequate with 23.53 per cent each.

A significant number (35.30 %) of farmers reported that non availability of IV. Seeds at right time an IVth important ranking and 47.06 per cent reported problems of pest as Vth ranking. Not available at all was again not the major problem.

Thus it can be concluded that in NFSM district Vidisha in the problem relating to poor pests resistance varieties of pulses was the major problem faced by the pulse cultivators. The other major problem was lower yield than expected followed by ultimately availability of seed.

Non NFSM District Sehore

Tur

Table 5.13 Households reporting problems with improved varieties of tur: Non-NFSM District, Sehore

Problem	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	2 (6.89)	27 (93.10)	29 (100)
Available but not in time	4 (13.79)	--	4 (13.79)	4 (13.79)	17 (58.62)	--	29 (100)
Very Expensive	1 (3.44)	1 (3.44)	3 (10.34)	15 (51.72)	7 (24.13)	2 (6.89)	29 (100)
Need Large Doses of Other Inputs	2 (6.89)	18 (62.06)	9 (31.03)	--	--	--	29 (100)
Much lower yield than expected	2 (6.89)	7 (24.13)	13 (44.82)	7 (24.13)	--	--	29 (100)
Pest resistance not adequate	20 (68.96)	3 (10.34)	--	3 (10.34)	3 (10.34)	--	29 (100)
Total	29	29	29	29	29	29	29 (100)

Figures given in parenthesis are percentage to total

The major problem with IV in the cultivation of improved varieties of Non NFSM district Sehore are presented in following table 5.5,6.7 and 8 for Arhar, Mung, Lentil and gram respectively.

As for the cultivation of improved varieties of tur crop in the non NFSM district almost 70 per cent farmers reported the problem relating to pest resistance not adequate as number one ranking and 13.79 per cent reported untimely availability of iv seeds as 1st ranking. The second most important problem faced by farmers that improved varieties of Arhar need large doses of other input and acquired IInd ranking by 62.06 per cent households. Much lower yield than expected was another major problem faced by the farmers and acquired IInd ranking after 24.13 per cent household.

44.24 per cent farmer said that much lower yield than expected was also an important problem faced by farmers while ranking this crop and given III rank to it. Expensiveness of the improved varieties of Arhar crop was ranked IV by 51.72 per cent farmers. The Vth and VIth ranking was assigned to problem relating to not available on time and not available all by 58.62 per cent and 93.10 per cent farmers respectively.

Mung

As for the cultivation of improved varieties mung crop on the farms belonging to the households of non NFSM district of Sehore, the problem relating to Pest resistance not adequate was reported by 55.55 per of the farmers followed by much lower yield than expected and available but not in time and acquired 22.22 per cent equally. The ranking of 3rd most important problem relating to cultivation of mung crop was shared equally (33.33 per cent) by need large doses of inputs and very expensive nature of seeds. The problem relating to improved variety of mung crop. The seed not availability at all received last ranking and 88.88 per cent farmers gave this problem as 6th ranking (5.14)

Table 5.14 Households reporting problems with improved varieties of mung: Non-NFSM District, Sehore

Problem	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	TOTAL
Not available at all	--	--	--	--	1 (11.11)	8 (88.88)	9 (100)
Available but not in time	2 (22.22)	2 (22.22)	2 (22.22)	--	3 (33.33)	--	9 (100)
Very Expensive	--	--	3 (33.33)	1 (11.11)	4 (44.44)	1 (11.11)	9 (100)
Need Large Doses of Other Inputs	--	--	3 (33.33)	6 (66.66)	--	--	9 (100)
Much lower yield than expected	2 (22.22)	5 (55.55)	1 (11.11)	1 (11.11)	--	--	9 (100)
Pest resistance not adequate	5 (55.55)	2 (22.22)	--	1 (11.11)	1 (11.11)	--	9 (100)
Total	9	9	9	9	9	9	9 (100)

Figures given in parenthesis are percentage to total

Lentil

The above table indicated that of the 50 pulse growing farmers 20 farmers also grew lentil. Of these, a significantly large percentage of farmer (60%) reported that improve varieties were not adequately resistant to pests and diseases and ranked it as number 1 problem. Another 30 percent reported a much lower yield than expected as major problem. As for as second most important problem is concerned, 55 percent farmers found lower than expected yield as 2nd most important problem followed by poorly pest and disease resistant variety60 percent It can be seen that availability was not a major problem and this problem did not find place in 4 most important problem related to improved varieties of lentil. Varieties not available at all or on time availability problem 85 and 65 percent farmers reported as 6th and 5th most important problem respectively.

Table 5.15 Households reporting problems with improved varieties of lentil: Non-NFSM District, Sehore

Problem	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	1 (7.14)	--	--	--	1 (7.14)	12 (85.71)	14 (100)
Available but not in time	2 (14.28)		1 (7.14)	1 (7.14)	9 (64.28)	1 (7.14)	14 (100)
Very Expensive	--	--	2 (14.28)	8 (57.14)	3 (21.42)	1 (7.14)	14 (100)
Need Large Doses of Other Inputs	--	3 (21.42)	8 (57.14)	2 (14.28)	1 (7.14)	--	14 (100)
Much lower yield than expected	4 (28.56)	8 (57.14)	1 (7.14)	1 (7.14)	--	--	14 (100)
Pest resistance not adequate	7 (50.00)	3 (21.42)	2 (14.28)	2 (14.28)	--	--	14 (100)
Total	14	14	14	14	14	14	14 (100)

Figures given in parenthesis are percentage to total

Gram

Gram crop was again the most important pulse crop taken by the farmers in rabi season. 37 out of 50 selected farmers have taken gram crop during 2008-09.

As far the cultivation of improved varieties of gram crop the problem relating to pest resistance not adequate was the most important problem accounted by the farmers. This problem accounted for 56.75 per cent of the total farmers who reported this problem as most important or 1st ranking followed by problems relating to lower yield than expected 27.02 per cent and untimely availability of seeds 10.81 per cent 35.13 per cent farmers felt that it was prior yield that expected was second most important problem.

Other 29.72 reported problems relating to pest infested almost equal number 27.02 per cent reported as second most important problem (table 5.16).

Table 5.16 Households reporting problems with improved varieties of gram-non NFSM District, Sehore

Problem	Rank1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	TOTAL
Not available at all	1 (2.70)	--	1 (2.70)	1 (2.70)	3 (8.10)	31 (83.78)	37 (100)
Available but not in time	4 (10.81)	2 (5.40)	1 (2.70)	11 (29.72)	18 (48.64)	1 (2.70)	37 (100)
Very Expensive	--	1 (2.70)	10 (27.02)	9 (24.32)	15 (40.54)	2 (5.40)	37 (100)
Need Large Doses of Other Inputs	1 (2.70)	10 (27.02)	12 (32.43)	12 (32.43)	--	2 (5.40)	37 (100)
Much lower yield than expected	10 (27.02)	11 (29.72)	11 (29.72)	3 (8.10)	1 (2.70)	1 (2.70)	37 (100)
Pest resistance not adequate	21 (56.75)	13 (35.13)	2 (5.40)	1 (2.70)	--	--	37 (100)
Total	37	37	37	37	37	37	37 (100)

Figures given in parenthesis are percentage to total

In can be seen from the table the cultivation of improved varieties of gram crop also needed higher doses of other inputs and 32.43 per cent farmers have given 4th ranking to this problem another problem like untimely availability of seed with 29.72 and higher cost of seed with 24.32 per cent also acquired 4th ranking among all the problems non available was not a major issue, as far as cultivation of gram crop was concerned the farmers of 2nd NFSM district, Sehore.

The major problem with respect to improved varieties of mung, tur, lentil and gram on in the entire crop was pest resistance or pest resistance was not adequate. However, the problem related to poor yield than expected was major problem in the cultivation of improved varieties of pulse crop.

5.5 Suggested solutions for improved varieties in NFSM and non NFSM districts

In the previous section various problems faced by pulse growers during cultivation of improved varieties of pulse crops NFSM district Vidisha and non NFSM district Sehore were discussed and analyzed in detail. The major problems were lower yield than expected problem relating to pest infestation and higher input costs were discussed. However some suggestions were also sought from the sampled household to overcome those problems in the cultivation of improved varieties.

NFSM District Vidisha

Gram

In the case of gram crop cultivation subsidy was the major issue and 47.92 per cent farmers favored this solution as the best solution to overcome the various problems in cultivation of improved varieties of gram crop. Most of the farmers were in the

opinion that subsidiary will reduce the cost effectively while 33.33 per cent suggested timely availability would be the best solution only 18.75 per cent farmers registered their vote in favors of cheaper availability of seed will defectively be a good solution.(table 5.17).

Table 5.17: Suggested solutions for improved varieties of gram

Suggestions	Rank 1	Rank 2	Rank 3	Rank 4	Total
Cheaper availability of seeds	9 (18.75)	14 (29.17)	25 (52.08)	--	48
Timely availability of seeds	16 (33.33)	20 (41.67)	12 (25.00)	--	48
Subsidy	23 (47.92)	14 (29.16)	11 (22.92)	--	48
Any other (Specify)	--	--	--	--	48
Total households	48	48	48	48	48

Figures given in parenthesis are percentage to total

After ranking 1st solution 41.67 farmer put the timely availability of seed as the 2nd ranking while for 2nd ranking equally number of farmers suggested subsidy and cheaper availability of seed at number 2nd rank. At 3rd ranking 52.08 per cent farmers suggested cheaper availability as the solution for problems related with cultivation of improved varieties of gram crop. However, none suggested any other solution to overcome these problems.

Lentil

Like gram, in the cultivation of improved varieties of lentil, 45 per cent farmers suggested that subsidy would reduce the cost burden effectively. Another 33.33 per cent suggested timely availability at number 1st ranking. At 2nd and 3rd ranking equal number (40 percent each) suggested cheaper availability and subsidy at 2nd and 3rd rank respectively (table 5.18).

Table 5.18 Suggested solutions for improved varieties of lentil

Suggestions	Rank 1	Rank 2	Rank 3	Rank 4	Total
Cheaper availability of seeds	6 (30.00)	8 (40.00)	6 (30.00)	--	20
Timely availability of seeds	5 (25.00)	7 (35.00)	8 (40.00)	--	20
Subsidy	9 (45.00)	5 (25.00)	6 (30.00)	--	20
Any other (Specify)	--	--	--	--	20
Total households	20	20	20	20	20

Figures given in parenthesis are percentage to total

Again a good number (45%) of farmers suggested that providing subsidy would make the difference. While another 30 per cent felt availability of cheaper seed was a good solution 25 per cent favored timely availability as at number 1st ranking.

At number 2nd ranking, 40.00 per cent farmers favored timely availability as the 3rd most important ranked solution. The equal number of farmers (30 per cent each) favored other two solutions as 3rd ranking solution.

Tur

Tur was another crop being grown in the district. Most of the farmers took this crop for home consumption. However, 60 per cent farmers suggested subsidy was the best option to overcome the problems in cultivation of tur crop. Remaining twenty per cent each suggested cheaper seed availability and time availability as the 1st ranking solution. Fifty per cent farmers suggested cheaper availability of seed as 2nd ranking solution. About 60 per cent farmers felt that 3rd rank solution was timely availability of seed.

Table 5.19: Suggested solutions for improved varieties of tur

Suggestions	Rank 1	Rank 2	Rank 3	Rank 4	TOTAL
Cheaper availability of seeds	2 (20.00)	5 (50.00)	3 (30.00)	--	10
Timely availability of seeds	2 (20.00)	2 (20.00)	6 (60.00)	--	10
Subsidy	6 (60.00)	3 (30.00)	1 (10.00)	--	10
Any other (Specify)	--	--	--	--	10
Total households	10	10	10	10	10

Figures given in parenthesis are percentage to total

For tur crop the most important solution was again, the provision of subsidy in the cultivation of improved variety of tur and 60 per cent favored this, other solution got 20% each: The cheaper seed was the 2nd best ranking solution which found favor from 50 per cent farmers and 3rd best solution was timely availability of seeds of improved varieties of tur crop.

Urid

As for urid crop the study revealed that in NFSM district Vidisha suggestions like subsidy. Cheaper availability of seeds and timely availability of seed received almost equal weightage 29.41 percent each. However, the suggestion of subsidy received the highest ranking from the farmers (41.18 %).

Thus the farmers of sampled households favored subsidy as the best solution. In this crop the farmers were evenly distributed on different suggestions. (Table5.20)

Table 5.20: Suggested solutions for improved varieties of urid

Suggestions	Rank 1	Rank 2	Rank 3	Rank 4	Total
Cheaper availability of seeds	5 (29.41)	6 (35.29)	6 (35.30)	--	17
Timely availability of seeds	5 (29.41)	6 (35.80)	6 (35.29)	--	17
Subsidy	7 (41.18)	5 (29.41)	5 (29.41)	--	17
Any other (Specify)	--	--	--	17 (100.00)	17
Total households	17	17	17	17	17

Figures given in parenthesis are percentage to total

Non NFSM District Sehore

In the non NFSM district Sehore the major suggested solution related to overcome the problems in the cultivation of improved varieties of lentil, gram, tur and mung has been presented in the following tables no 5.21 to 5.24.

Lentil

Lentil was grown by the 14 farmers and 42.86 per cent felt that making timely availability of seeds of improved varieties would solve the problems arises during cultivation. A significant number of farmers (35.71 %) also suggested cheaper availability of seeds and 21.43 percent suggested subsidy as the best option.

Cheaper availability of seeds was the 2nd best option and 42.86% households suggested this as the 2nd best solution while subsidy was the 3rd best solution as 57.14 formers noted in favor of this as 3rd ranking(Table5.21)

Table 5.21 Suggested solutions for improved varieties of lentil

Suggestions	Rank 1	Rank 2	Rank 3	Rank 4	Total
Cheaper availability of seeds	5 (35.71)	6 (42.86)	3 (21.43)	--	14
Timely availability of seeds	6 (42.86)	5 (35.71)	3 (21.43)	--	14
Subsidy	3 (21.43)	3 (21.43)	8 (57.14)	--	14
Any other (Specify)	--	--	--	--	14
Total households	14	14	14	14	14

Figures given in parenthesis are percentage to total

Lentil was grown by the 14 farmers and 42.86 per cent felt that timely availability of seeds of improved varieties would solve the problems arises during cultivation. A significant number of farmers (35.71 %) also suggested cheaper availability of seeds and (21.43%) suggested subsidy as the best option.

Cheaper availability of seeds was the 2nd best option and 42.86 percent households suggested this as the 2nd best solution while subsidy was the 3rd best solution as 57.14 formers noted in favor of this as 3rd ranking solution.

Gram

Gram was grown by majority of the farmers and is a very important pulse crop in the cropping pattern of the selected farmers 37.84 percent farmers suggested subsidy as the best option to minimize the cost of production another 27.03 percent suggested that cheaper availability would reduce the cost burden effectively. Subsidy was even voted as the 2nd best ranked option also as 32.43 percent favored it. At 3rd rank other problems like electricity etc find a good favor and 37.84 voted in favor. At rank 4rth timely availability was the major suggestion for overcoming the various problems encountered by farmers during the cultivation.

Table 5.22 Suggested solutions for improved varieties of gram

Suggestions	Rank 1	Rank 2	Rank 3	Rank 4	Total
Cheaper availability of seeds	10 (27.03)	10 (27.03)	7 (18.91)	10 (27.03)	37
Timely availability of seeds	5 (13.51)	8 (21.62)	10 (27.03)	14 (37.84)	37
Subsidy	14 (37.84)	12 (32.43)	6 (16.22)	5 (13.51)	37
Any other (Specify)	8 (21.62)	7 (18.91)	14 (37.84)	8 (21.62)	37
Total households	37	37	37	37	37

Figures given in parenthesis are percentage to total

Tur

In the case of tur crop farmers suggested cheaper availability of tur seed as the best solution and 48.28 per cent registered this solution as their most preferred solution followed by availability of seed and subsidy with 34.48 and 17.27 per cent notes respectively.

As for 2nd rank category, availability of seeds at proper time with 44.83 per cent note subsidy with 17.24 per cent notes respectively. A large number of 65.52 per cent subsidies as the 3rd option.

Table 5.23 Suggested solutions for improved varieties of tur

Suggestions	Rank 1	Rank 2	Rank 3	Rank 4	Total
Cheaper availability of seeds	14 (48.28)	11 (37.93)	4 (13.79)	--	29
Timely availability of seeds	10 (34.48)	13 (44.83)	6 (20.69)	--	29
Subsidy	5 (17.24)	5 (17.24)	19 (65.52)	--	29
Any other (Specify)	--	--	--	--	29
Total households	29	29	29	29	29

Figures given in parenthesis are percentage to total

Mung

In the case of mung crop, only 9 farmers have taken this in their cropping pattern. Timely availability was the major solution with 44.44 percentage share as the 1st ranking solution 33.33 per cent registered cheaper availability of seed as their 1st ranking solution. As for second ranking solution all the farmers were equally divided between all 3rd ranking solutions.

Subsidy was the last ranking or 3rd ranking choice and off the total farmers 44.44 percent felt that this was the best 3rd ranking solution.(Table5.24)

Table 5.24 Suggested solutions for improved varieties of mung

Suggestions	Rank 1	Rank 2	Rank 3	Rank 4	Total
Cheaper availability of seeds	3 (33.33)	3 (33.33)	3 (33.34)	--	9
Timely availability of seeds	4 (44.44)	3 (33.33)	2 (22.22)	--	9
Subsidy	2 (22.22)	3 (33.33)	4 (44.45)	--	9
Any other (Specify)	--	--	--	--	9
Total households	9	9	9	9	9

Figures given in parenthesis are percentage to total

5.6 Marketing of pulses in NFSM and non NFSM Districts

In selected NFSM district Vidisha and non-NFSM district Sehore, the pattern of marketing was almost similar to the pattern presented in the state. Farmers sold their produce(pulses)mostly through regulated market at prevailing market rate through commission agents in the villages itself or to the village markets. A very insignificant quantity was also sold to friends and relatives.

The number of selected household marketing of different pulses through various channels in NFSM district Vidisha and non-NFSM district Sehore has been presented through the following tables. Since the marketing pattern was also the same during 2006-

07 to 2008-09, hence marketing of pulses was attempted only for 2006-07 (pre NFSM) and 2008-09 (post NFSM) only.

5.6.1 Marketing of pulses in NFSM District Vidisha

Marketing of gram:

The table 5.25 revealed that farmers preferred regulated market and commission agent over other channels for marketing of their produce, in Vidisha 96% farmers sold their produce through there channels, while in 2008-09 98% produce sold was rooted through these channels. During 2007-08 the share of village market was only 2% while in 2008-09 none of the farmers reported any quantity sold through this channel. The share of other channels including neighbors, friends, and relatives was same (4%) during 2007-08 and 2008-09.

Among different categories 67 per cent marginal farmers sold their produce in regulated market in 2007-08, 22 per cent marginal farmers sold to commission agents and 11 percent sold in village market also to meet out urgent financial needs. The share of regulated market was also very high and 80.94 and all the small, medium and large farmers sold their produce in regulated markets for better price. Similarly, in 2008-09 also the majority of selected farmers preferred regulated market while 20 percent small and 11 percent marginal farmers sold their produce through other channels and commission agents.

Marketing of lentil:

Lentil is another pulse crop of rabi season. In this crop, like gram crops, majority (72%) of the total lentil producing farmers sold their produce in regulated market while 80 percent medium and all the large farmers sold their lentil in regulated market. It is clear from this table that 100 percent small, 50 percent of marginal, 20 percent medium farmers also preferred commission agents. In 2008-09 the share of produce sold in regulated market rose to 95 percent among different categories 33 percent small farmers also sold the marketable quantity to commission agent.

Marketing of tur:

Tur crop is mainly grown for home consumption. However, some quantity was also sold in market. Overall entire produce was sold in regulated market in 2007-08, 43 percent each was sold either to commission agent or in regulated market. Village market also contributed 14 percent to total percentage of produce sold. It can also be seen that the marginal and small farmers sold no quantity in these market as they had very little quantity of tur in both the years and they either consumed it at home or retained for seeds required for next year.

Marketing of urid:

Table 5.25 revealed that in 2007-08 all the marginal and small farmers sold urid in village market. On the contrary, all the medium and large farmers sold their urid crops to commission agents. In 2008-09 the marginal farmers sold their produce in village market. While 50 per cent sold to commission agent, 25 per cent small farmers sold in village market while 75 per cent opted commission agent in 2008-09. Overall 53 per cent in 2007-08 and 82 per cent in 2008-09 farmers preferred commission agent for selling of urid crops.

5.6.2 Quantity of pulses sold through various channel, NFSM District Vidisha

The estimates of total quantity of marketed surplus of pulse, their share in various channels along with average selling price of pulse for different category of farmers selected for study have been given in (table 5.26 A & B).

Gram

In case of NFSM district Vidisha , the quantity of gram sold through regulated market was 506.5 quintal (97%) followed by commission agent 11 qtl (2.10%), others 3.5 qtl (0.67%) and village market 2qtl during the year 2007 – 08. in 2008 – 09 the quantity sold through regulated market increased to 811 quintal (98.54 %) followed by other means 12 quintal (1.46 %) and commission agent 4 quintals (0.48 %) this clearly indicates that the farmers particularly large and medium mostly preferred regulated market for selling their produce and very few sells to local market or to commission agents.

Even small and marginal farmers sell their produce in *Mandies* or regulated market through forming a group or cartel or by help of other large farmers for better price for their produce especially for crop like soybean, gram, lentil and wheat etc.

Lentil

In case of NFSM district Vidisha the quantity of Lentil sold through regulated market was 70 quintal (84.34%) followed by sold through commission agent 11 quintals (13.25%) and through village market 2 quintals (2.41%) in 2008 – 09 the quantity sold through regulated market was risen to 102 quintals (96%) followed by a declined quantity of 4 quintals through commission agent. It is very clear that farmers received higher price for their produce in regulated market as compared to price paid by commission agent.

Tur:

In contrary to gram and lentil market, where farmers sold their produce mainly to regulated market tur was sold mainly through commission agent or in village market itself because of little marketable surplus of tur crop and in 2006 – 07 the tur sold through commission agent was 4 quintals (50%) followed by through village market 3 quintals (37.5%) and remaining 12.5 or 1 quintals was sold to others including relatives friends etc. in 2008 – 09 the quantity sold through commission agent risen to 8 quintals and the entire marketable surplus was purchased by commission agents only.

Urid:

In the case of Urid crop, the entire quantity was sold through commission agent and through village market only. Of the total quantity produced (19.5quintals) 61.54 per cent or 12 quintals was sold through commission agent and remaining 38.46 percent was sold in village market itself in 2007 – 08. In 2008 – 09 the quantity of surplus Urid increased and 27.50 quintals (84.61per cent) was sold through commission agent and only 5 quintals (15.39%) was sold in village market.

5.7 Marketing of pulses in non –NFSM district Sehore

The marketing of pulses through various channels in non NFSM district Sehore has been represented in table 5.27

Gram:

In case of gram in non NFSM district Sehore (76%) of gram crop was sold through regulated market. The other channels adopted by the farmers were commission agents and village market (12% each) in 2007-08. It may be noted that marginal farmers did not sell any quantity in regulated market and sold mostly in village market and through commission agent (50%) each. Large farmers preferred regulated market (100%). In 2008-09 also 79% farmers sold in regulated market. However the percentage of farmers who sold their produce to commission agent increased to 16 percent over the year 2007-08. The remaining, mostly marginal, preferred village market (5%).

Lentil:

In case of lentil crop in 2007-08, 76percent of selected farmers of non NSFM district Sehore sold their lentil crop through regulated market which was easily accessible to them. In the same year the share of commission agent and village market in total quantity sold through various sources was 16 percent and 8 percent respectively. In 2008-09 the entire marketable surplus of lentil crop was sold only through regulated market. The farmers did not prefer any other channel in this year.

Tur:

Table 5.27 further revealed that in case of the tur crop which was normally grown in rain fed marginal land, for household consumption and for their purpose like making roof, broom, etc. the farmers sold their marketable surplus through regulated market(52%) followed by, through commission agent and village market (24%each) in 2007-08. However, in 2008-09 the number of farmers who sold tur in regulated market declined marginally to 47 percent. The share of village market in total quantity sold increased by 5percent over last year. The remaining 24percent still preferred commission agent.

Mung:

In Sehore, some of the farmers started cultivating mung recently and therefore, very little surplus production was available for marketing. However during both the year 78 percent mung was sold through commission agent and remaining 22 percent sold in village market.

5.7.1 QUANTITY OF PULSES SOLD THROUGH VARIOUS CHANNELS IN NON-NFSM DISTRICT SEHORE:

The estimates of total quantum of marketable surplus sold through various channels have been given in (table 5.28 A & B) for different categories of selected farmers belonging to non NFSM district Sehore.

Gram:

In case of marketable surplus, the gram sold through regulated market was 118 quintal (88.72%), followed by commission agent 10 quintal (7.52%) and village market 5 quintal (3.76%).None of the farmers sold any quantity to friends, neighbors and relatives .In the year of 2008-09 the quantity of marketed surplus increased substantially and 239quintals (86.9%) was sold in regulated market. Some quantity was also sold to commission agent 34quintals (12.36%) and in village market 2quintals (0.23 %).

Lentil:

In case of non NFSM district Sehore, during 2007-08 the quantity of marketed surplus of lentil sold through regulated market was 42quintals (87.5%) followed by commission agent 5quintals (10.42%) and village market 1quintal (2.8%). Farmers had not sold any quantity to either government or to any friends, relatives, etc. In the year 2008-09, the quantity sold through regulated market increased to 61quintals and the entire marketed surplus was sold through regulated market only.

Tur:

In case of tur crops, in 2007-08 the selected farmers also sold 32quintals (61.55%) through regulated market and 11 quintals (21.15%) through commission agents. The remaining 9 quintals (17.30%) was sold in village market itself. In 2008-09 the total quantity sold through these channels witnessed a substantial increase across the board. Of the total quantity (75quintals) of marketed surplus, 46quintals (61.33%) was sold in regulated market, followed by 15 quintals (20%) in village market and remaining 14 quintals (18.67%) through commission agents. Category wise none of these farmers belonging to marginal and small size categories sold any quantity of tur crops to any agency and retained it for house hold consumption.

Mung:

In case of mung crops, in 2007-08 the total quantity of marketed surplus was only 11 quintals of this, 9 quintals (81.82%) was sold through commission agents and remaining 2 quintals (18.18%) to village market. In 2008-09 the situation remained the same as only 12 quintals mung was sold in village market. In this year also no farmers belonging to marginal and small categories reported any quantity of mung marketed. They retained the small quantity for house hold consumption.

5.8 Extent of Government (NAFED) Procurement of Pulses :

From farmers of NFSM and non NFSM districts it was observed that none of the selected farmers belonging to NFSM district Vidisha and non -NFSM district Sehore sold any quantity of their pulses to government agencies like NAFED and therefore, the procurement was nil in these selected districts.

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CHAPTER VI

FARMER'S PERCEPTION

In this section of analysis, study explored the various possible determinants of growing or cultivating pulse crops by the farmers. It is well established that number of reasons influenced farmers for cultivating pulses like: pulses needed for home consumption, inferior quality or poor quality of land, lack of irrigation erratic monsoon rains, demand of particular pulse or market price of pulse crops etc. Apart from this the farmers opinion regarding problems in the cultivation of pulses and their suggested solution with respect to cultivation of various pulse crops were also addressed.

6.1 Reasons for growing pulses in NFSM and non NFSM district

The reasons for growing pulses by the selected farmers of NFSM district Vidisha and Non NFSM district Sehore are given in table 6.1, 6.2, 6.3 and 6.4 respectively.

The analysis indicate that farmers were cultivating pulses for many reasons: but the most important reason was to gain more income out of it. In both the district profitability was found to be the major determinant for cultivation of pulses. Sixty per cent in Vidisha (NFSM) district and 54 per cent in Sehore,(non NFSM district indicated profitability as major reason. The other important reasons have which influenced farmers to cultivate pulses was lack of assured irrigation as 22 per cent of Vidisha farmers and 28 per cent of Sehore farmers had cultivated pulses for this reason.(Table 6.1 & 6.2)

Table 6.1 Reason for growing pulse:

Reasons	NFSM District Vidisha		non NFSM District Sehore	
	Total No. of households	% of total households	Total No. of households	% of total households
Home consumption	07	14	06	12
Animal feed	--	--	--	--
Inferior quality of land	02	04	03	06
Lack of irrigation	11	22	14	28
Profitability	30	60	27	54
Others	--	--	--	--
Total	50	100	50	100

Cultivating pulse for household consumption was also an influencing reason and 14 and 12 per cent farmers of Vidisha and Sehore had taken these crops for this reason respectively).

Even category wise also profitability was found to be the most influencing factor for cultivating pulse crop in both the districts small, medium and large six farmer reported this factor as the motivating reason, whereas home consumption was the major influencing reason. Cultivating pulses as marginal farmers is both the districts

Table 6.2 Reason for growing pulses: size group wise: NFSM district Vidisha

(No. of Households)

Reasons							
NFSM district Vidisha							
Class	**Home consump-tion**	**Animal feed**	**Inferior quality of land**	**Lack of irrigation**	**Profitabi lity**	**Others**	**Total**
Marginal	5	--	--	3	2	--	10
%	(50.00)			(30.00)	(20.00)		(100.00)
Small	2	--	1	2	6	--	11
%	(18.18)		(9.09)	(18.18)	(54.54)		(100.00)
Medium	--	--	--	4	12	--	16
%				(25.00)	(75.00)		(100.00)
Large	--	--	1	2	10	--	13
%			(7.69)	(15.38)	(76.92)		(100.00)
Total	7	--	2	11	30	--	50
%	(14.00)		(4.00)	(22.00)	(60.00)		(100.00)
Non NFSM district, Sehore							
Marginal	4	--	--	2	4	--	10
%	(40.00)			(20.00)	(40.00)		(100.00)
Small	1	--	2	3	7	--	13
%	(7.70)		(15.38)	(23.07)	(53.85)		(100.00)
Medium	1	--	--	4	10	--	15
%	(6.66)			(26.66)	(66.68)		(100.00)
Large	--	--	1	5	06	--	12
%			(8.33)	(41.66)	(50.00)		(100.00)
Total	6.00	--	3	14	27	--	50
%	(12.00)		(6.00)	(28.00)	(54.00)		(100.00)

Figures given in parenthesis are percentage to total

6.2 Criteria used while opting to grow pulses

Among the selected farmers of NFSM district Vidisha 40 per cent farmers mentioned that extent of irrigation was the main criteria for deciding the allocation of area under various pulse crops followed by rain fall (22%) suitability of land (9%) and home consumption (12%). Since land quality was not poor so this was not the deciding factor and only 6 per cent farmers cited this as an important deciding factor (Table 6.3).

Table 6.3: Criteria used while opting to grow pulses:

Reasons	NFSM District, Vidisha		Non NFSM district, Sehore	
	No	%	No	%
Rainfall	06	12	11	22
Soil suitability	10	20	9	18
Home requirement	07	14	6	12
Inferior quality of land	04	08	3	06
Extent of irrigation	23	46	21	42
Others	--	--	--	--
Total	50	100	50	100

Similarly, in non NFSM District Sehore, 42 per cent farmer's favoured irrigation as main criteria for deciding the allocation of land for different crops followed by (22%) home consumption (14%) etc. In this district also quality of land was not the influencing criteria as the land quality was not poor.

In NFSM district Vidisha the main reason of less area for pulse crops was extent of less irrigation 42 per cent farmers informed that extent of irrigation was main reason.

6.3 Reasons for less area under pulses in general

In NFSM district Vidisha the 42 per cent of selected farmers have cited low yield as the main reason for low area under pulse most of there farmers informed that even improved varieties have failed to give higher on expected yield. Infestation of pests and insects was another important reason and 26 per cent farmers expressed this problem as a factor followed low profitability (18%) by instability in yield and price (14%).(Table6.4)

Table 6.4: Reasons for low area under pulses.

Reasons	NFSM district, Vidisha		NON district, Sehore	
	No	%	No	%
Low profitability	09	18	8	16
Low yield	21	42	18	36
Instability (yield or price or both)	07	14	10	20
Marketing problem	--	--	2	04
Pest problem	13	26	12	24
Others	--	--	-	-
Total	50	100	50	100

Similarly in non NFSM district Sehore 36 per cent farmers reported low yield as the major determinant followed by infestation of pest (24%) percent , yield instability 20 per cent and low profitability (16%). In both the district very few farmers cited marketing as major reason for low area under pulses. This clearly indicates that farmers had more accessibility for market for their products and market price information.

6.4 Crop grown on inferior quality of land

Normally, farmers allocate inferior quality of land to crops like pulses or crops which do not need high investment but still give good yield and return. In NFSM district Vidisha farmers found to cultivated mostly coarse cereals like maize millets, pulses and in some extent superior quality cereals also and it was found that 62 per cent farmers in Vidisha district were cultivating pulses on such land, however 22 per cent and 14 per cent of selected farmers also used inferior quality of land for the cultivation of oil seeds like soybean and coarse cereals like maize respectively.

In non NFSM district, Sehore the inferior quality of land was not only used for pulse but the crops like maize coarse cereals in rabi and oilseed like soybean in kharif season were also cultivated of the total selected farmers in Sehore 54 per cent farmer used such land for pulses. The remaining 24 per cent used for oil seeds cultivation 16 per cent for coarse cereals and 6 per cent farmers reported that they have cultivated superior cereal like wheat also (Table 6.5).

Table 6.5: Crops grown on inferior quality lands:

Reason	NFSM District Vidisha		Non NFSM District Sehore	
	No	%	No	%
Superior cereals	1	02	3	06
Coarse cereals	7	14	8	16
Pulses	31	62	27	54
Oilseeds	11	22	12	24
Vegetables	--	--	--	--
Any other (specify)	--	--	--	--
Total	50	100	50	100

6.5 Problems of growing pulses in inferior quality land

The quality and yield of a crop is generally depend on the quality of land if the quality of land is inferior than the yield and quality of both yield and quality of seed will definitely detention ate significantly. The response on this, most of the selected farmers of Vidisha and Sehore district reported that the quality and well as yield suffered when they cultivate pulse on such lands. In NFSM district Vidisha 54 per cent farmers reported low yield as the major problem in the cultivation of pulses on poor quality of land whereas 34 per cent reported both quality of seed as well as low yield as a major problem. Remaining 12 per cent cited low yield as the result of using poor quality of land for cultivation of pulses.

Similarly, the farmers belonging to the non NFSM district Sehore 54 per cent farmers reported that both qualities of seed as well as yield suffered while pulse cultivated on poor quality of land. Forty two per cent reported low yield as the major problem faced by them in the cultivation of pulses on inferior quality of land. Only 4 per cent reported poor quality of grain as a major problem as a result of cultivation of pulses on such type of land.

Table 6.6: Problems of growing pulses on inferior quality lands:

Reason	**NFSM District Vidisha**		**Non NFSM District Sehore**	
	No	%	No	%
Yield is low	27	54	21	42
Grain quality is poor	6	12	02	04
Both 1 and 2	17	34	27	54
Total	50	100	50	100

6.6 Reasons for shifting from pulses to other crop

In this study only 5 farmers belonging to NFSM district Vidisha and 9 belonging to Non NFSM district Sehore reported that they had shifted area of urid crop to other crops either fully or partially. The main reason was large doses of other inputs resulting to high infestation of insects and wilt. Few farmers also reported that they had shifted land became of poor yield of pulse crop (Table 6.7).

Table 6.7: Reasons for shifting from pulses to other crops:

Reason	**NFSM District, Vidisha**		**Non NFSM District Sehore**	
Yield is low	02	04	02	04
Price realization is low	--		--	
No assured market	--		--	
Yield of improved varieties is uncertain	--		--	
Large doses of other inputs required	03	06	07	14
Any other (specify**)**	--		--	
Total	05	100	09	100

6.7 Farmer willing to grow pulses if assured market is available

Study revealed that all the farmers of Vidisha and Sehore were not only willing to grow pulse but also willing to expand the area, under pulses if government ensuing an assured procurement mechanism and competitive price as well (Table 6.8).

Table6.8: Farmers willing to grow pulses if assured market is provided:

	NFSM district, Vidisha			Non NFSM district Sehore		
	No	Total no of farmers in the size group	Percent	No	Total no of farmers in the size group	Percent
Marginal	10	10	100.00	10	10	100.00
Small	11	11	100.00	13	13	100.00
Medium	16	16	100.00	15	15	100.00
Large	13	13	100.00	12	12	100.00

6.8 Major problems in cultivation of pulses

Major problems that were affecting the production of pulses in the pulse production in general were lack of irrigation facilities; improved varieties lower yield, seed of high doses of inputs or high production cost losses due to insect's pests and diseases and low market prices. However among1st ranked problems Vidisha 32 per cent of farmers reported high incidence of will disease as a major problem closely followed by infestation of insects 24 per cent specially in gram and lentil crop.

Lack of irrigation was the 3rd important problem (14%) some of the farmers also informed that lack of high yielding varieties (not improved varieties which are available) HYV's were the one of the major problem affecting pulse production.

Similarly, among 2nd ranked problem 42 per cent farmers given incidence of pest as the most important followed by will disease 24 per cent and lack of irrigation by 14 per cent.

Among problems on 3rd rank 48 per cent farmers gave highest vote to irrigation facility followed by lack of improved varieties (24 per cent).

Among 4th ranked problem 24 per cent farmer selected high input cost as a 4th ranked major problem and low market price (20% each) per cent note followed by lack of irrigation facility.(Table 6.9)

Table 6.9: Major problems in cultivating pulses: NFSM district, Vidisha

(No. of farmers)

Reason	Rank1	Rank2	Rank3	Rank4	Rank5	Rank6	Total
Lack of irrigation facilities	07	07	16	10	07	03	50
	(14.00)	(14.00)	(32.00)	(20.00)	(14.00)	(0.6)	(100)
Lack of improved varieties	05	05	12	05	08	15	50
	(10.00)	(10.00)	(24.00)	(10.00)	(16.00)	(30.00)	(100)
Lower yield	--	--	--	--	--	--	
Of Pest	12	21	4	07	06	--	50
	(24.00)	(42.00)	(8.00)	(14.00)	(12.00)		(100)
Low price market	06	01	9	10	9	15	50
	(12.00)	(2.00)	(18.00)	(20.00)	(18.00)		(100)
Any other (specify) wilt	16	12	06	06	06	4	50
	(32.00)	(24.00)	(12.00)	(12.00)	(12.00)	(8.00)	(100)
Total High input cost	4	4	03	12	14	13	50
	(8.00)	(8.00)	(0.6)	(24.00)	(28.00)	(26.00)	(100)

The main suggestions on the 1st rank 32 per cent of farmer suggested that availability of pest and disease resistant varieties should be made available 28 per cent suggested that improving irrigation facility would reduce the problem of pulse cultivation. Availability of HYV was also suggested by 20 per cent farmers as first ranked suggestion. Availability of HYV of pulse pest and disease resistant varieties and improving irrigation facility with 42, 24 and 24 per cent note were the 2nd ranked suggestions respectively.

At 3rd rank suggestion, preferences were equally distributed. Thus, it is clear that in Vidisha district of incidences of insects/pest attack and disease like wilt were found to be the most important problems and farmers needed resistant varieties to control this problem. Assured irrigation with availability of HYV were the demands of the farmers for better production of pulses (Table 6.10).

Table6.10 Important suggestions from the farmers for cultivating pulses: NFSM district, Vidisha

(No of farmers)

Reason	Rank1	Rank2	Rank3	Rank4	Rank5	Rank6	Total
Improving irrigation facilities	14	12	11	03	10	--	50
	(28.00)	(24.00)	(22.00)	(0.6)	(20.00)	--	(100)
Availability of high yielding varieties	10	21	10	06	03	--	50
	(20.00)	(42.00)	(20.00)	(12.00)	(0.6)	--	(100)
Availability of pest resistant varieties	16	12	10	05	17	--	50
	(32.00)	(24.00)	(20.00)	(10.0)	(34.00)	--	(100)
Assured procurement with MSP	--	--	--	--	--	50	50
						(100)	(100)
Higher market price	06	04	08	17	15	--	50
	(12.00)	(8.00)	(16.00)	(34.00)	(30.00)	--	(100)
Any other	04	01	11	17	17	--	50
	(8.00)	(0.2)	(22.00)	(34.00)	(34.00)	--	(100)
Total	50	50	50	50	50	50	50
						--	(100)

In non NFSM district Sehore lack of irrigation was ranked I with 34 per cent farmers viewed it as the most important problem in cultivation of pulses another 28 per cent farmer reported wilt disease on the most important problem. Some of the farmers (10%) also informed that the most important problem was the price of the products was below than their expectations. Among 2nd ranked problem 38 per cent farmers again reported lack of Irrigation as the most important 2nd ranked problem. Lack of improved varieties of pulse crops especially HYV incidence of pests/ insects were the most reported 3rd ranked problems with 36 and 34 per cent each respectively. Although the problem of low market price was not a major problem but 60 per cent farmers said that market price of their produce was not up to their expectation (table6.11).

Table 6.11: Major problems in cultivating pulses: NON-NFSM district, Sehore

(No. of farmers)

Reason	Rank1	Rank2	Rank3	Rank4	Rank5	Rank6	Total
Lack of irrigation facilities	07	07	16	10	07	03	50
	(14.00)	(14.00)	(32.00)	(20.00)	(14.00)	(0.6)	(100)
Lack of improved varieties	05	05	12	05	08	15	50
	(10.00)	(10.00)	(24.00)	(10.00)	(16.00)	(30.00)	(100)
Lower yield	--	--	--	--	--	--	
Of Pest	12	21	4	07	06	--	50
	(24.00)	(42.00)	(8.00)	(14.00)	(12.00)		(100)
Low price market	06	01	9	10	9	15	50
	(12.00)	(2.00)	(18.00)	(20.00)	(18.00)		(100)
Any other (specify) wilt	16	12	06	06	06	4	50
	(32.00)	(24.00)	(12.00)	(12.00)	(12.00)	(8.00)	(100)
Total High input	4	4	03	12	14	13	50
	(8.00)	(8.00)	(0.6)	(24.00)	(28.00)	(26.00)	(100)

In non NFSM district Sehore farmers suggested that availability of pest and disease resistant varieties will encourage the farmers to cultivate pulse crop because as this was a very important problem and 32 per cent farmers ranked at number 1st. Another 22 per cent farmers suggested regular power supply as the 1st ranks suggestion and this suggestion also got highest number at rank no. 2nd (32 per cent) and No. 3rd (26 per cent).

At rank 4th availability of high yielding varieties and improving irrigation facilities received 11 per cent each at No.5 assured procurement with MSP second highest number and 38 per cent farmers favored this (Table 6.12).

Table 6.12: Important suggestions from the farmers for cultivating pulses non-NFSM district, Sehore

(No of farmers)

Reason	Rank1	Rank2	Rank3	Rank4	Rank5	Rank6	Total
Improving irrigation facilities	14	12	11	03	10	--	50
	(28.00)	(24.00)	(22.00)	(0.6)	(20.00)	--	(100)
Availability of high yielding varieties	10	21	10	06	03	--	50
	(20.00)	(42.00)	(20.00)	(12.00)	(0.6)	--	(100)
Availability of pest resistant varieties	16	12	10	05	17	--	50
	(32.00)	(24.00)	(20.00)	(10.00)	(34.00)	--	(100)
Assured procurement with MSP	--	--	--	--	--	--	50
						--	(100)
Higher market price	06	04	08	17	15	--	50
	(12.00)	(8.00)	(16.00)	(34.00)	(30.00)	--	(100)
Any other	04	01	11	17	17	--	50
	(8.00)	(02.00)	(22.00)	(34.00)	(34.00)	--	(100)
Total	50	50	50	50	50	--	50
						--	(100)

Thus, the major suggestions of farmers belonging to the NFSM and non NFSM district were availability of pest/disease resistant HYV varieties improving existing irrigation facilities and regular power supply as most of the farmers assigned them 1st, 2nd or 3rd ranking.

6.9: Major pest problems in NFSM and Non NFSM districts

The selected farmers of NFSM district Vidisha and non NFSM district Sehore reported number of problems related to pests. It can be observed from the table that in both the district attack of pod borer was the major problem along with infestation of pod fly and these together caused significant damage. Farmers of both the districts have also reported the incidence of wilt and root not.

Damage due to pod borer was reported by 82 per cent of pulse growers of Vidisha and 74 per cent of Sehore district. The damage due to fly (*Safed Makkhi*) was reported by 44 and 64 per cent in Vidisha and Sehore respectively.

Wilt and root not were present in the fields of pulse crops in both the districts particularly in Lentil crop. Some farmers also reported damages due to attack of stray cattles and wild boars/ antelopes etc (Table 6.13)

Table: 6.13: Major pest problems:

NFSM district, Vidisha				
Types of Pest	**No. of Households reporting problems**	**% to total Households**	**Crop affected**	**Estimated yield loss qtls / acre**
Pod Border	41	82	Tur/ gram/ urid/	0.65
Pod Fly	22	44	Lentil / gram	0.50
Wilt	07	14	Gram/lentil	0.65
Root Rot	11	22	Lentil/ gram	0.72
Nematodes	--	--	--	--
Any others (Stray cattle, Antelopes & Wild boar)	13	26	--	N.A.
Non NFSM district, Sehore				
Pod Border	37	74	Tur/ gram/ urid/	0.72
Pod Fly	32	64	Lentil / gram	0.50
Wilt	12	24	Gram/lentil	0.35
Root Rot	09	18	Lentil/ gram	0.80
Nematodes	--	--	--	--
Any others (Stray cattle, Antelopes & Wild boar)	02	04	--	N.A.

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CHAPTER VII

IMPACT OF NFSM ON PULSES PRODUCTION

This chapter analyzes the impact of National Food security Mission (NFSM) on pulses especially on the yield of pulses of the selected farmers of Vidisha district, during 2008-09.

7.1 Awareness of about NFSM and assistance received

The study revealed that all the cultivator's irrespective of their size group were well aware of National Food security Mission (NFSM) on pulse all the selected farmers have also received the assistance under NFSM (Table 7.1 and 7.2).

Table 7.1 Farmers awareness NFSM pulses district Vidisha

Category	No of households aware	Total no of households in the size group	% of households aware
Marginal	10	10	100.00
Small	11	11	100.00
Medium	16	16	100.00
Large	13	13	100.00
Total	50	50	100.00

7.2 Types of assistance received

Under NFSM Scheme the farmers received various types of assistance i.e.

i) Breeders foundation and certified seeds,

ii) Assistance on Integrated Nutrient Management (INM) under this lime, gypsum and other micronutrients were given,

iii) Assistance on pests management,

iv) Equipment like seed driller and sprinklers and pipes were given,

v) Demonstration of various new cultivation technologies

vi) Training under farmers training components were provided.

All the selected farmers of Vidisha district received one or other type of assistance. In Vidisha farmers received assistance for seed purchase under NFSM; equipment like seed drill machine, sprinklers, pumps some farmers also received training on production technologies during the reference year.

Table 7.2 Received any assistance under NFSM – pulses district Vidisha

	No of households who received assistance	Total no of households in the size group	Percentage of households assisted
Marginal	10	10	100.00
Small	11	11	100.00
Medium	16	16	100.00
Large	13	13	100.00
Total	50	50	100.00

7.3 Distribution by type of assistance

Under NFSM 70.00 percent farmers received seed of high yielding varieties along with culture, 30.00 percent received equipment, mostly sprinkler. 48 percent received some training on production technologies also. The assistance under IPM and INM was negligible initially

There is overlapping of households as same household has received various assistance and therefore, the total exceeds the actual sample size (Table7.3).

Table 7.3 Distribution by type of assistance (no of households assisted*)

	Seed	INM	IPM	Equipment like seed drills etc	Demonstration	Training	Other	Total
Marginal	07	--	--	-	-	5	-	10
Small	09	--	-	04	-	6	-	11
Medium	12	01	01	04	-	6	-	16
Large	07	--	--	07	-	7	-	13
Total	35	01	01	15	-	24	-	50
% of farmers assisted to total farmers in size group								
Marginal	70.00	--	--	--	-	50.00	-	100.0
Small	81.81	--	--	36.36	-	54.54	-	100.0
Medium	75.00	6.25	6.25	25.80	-	37.50	-	100.0
Large	53.85	--	--	53.84	-	53.85	-	100.0
Total	70.00	02.00	02.00	30.00	-	48.00	-	100.0

7.4 Usefulness of NFSM

It is observed from the study that majority of the farmers found assistance received under NFSM was very useful as the various assistance extended under this programme helped them to increase the production of the pulse crops. Category wise all the farmers belonging to marginal and large farmers found assistance very useful. However this percentage of farmers found programme useful was 90.9 and 87.5 per cent for small and medium farmers respectively as some farmer did not find the NFSM useful.

7.5 Types of usefulness of NFSM Pulses

It has been observed during he study that NFSM pulses has helped farmers in various way as 84.00 percent participant farmers reported rise in yield level, 82.00 per cent farmers reported that training has increased their knowledge about pulse cultivation techniques and varieties. However, only 12.0 and 8.0 per cent farmers reported reduction in pest attack and drudging in pulse cultivation respectively.

Table 7.4 Use fullness of NFSM – pulses

Category	No of households who found useful	Total no of households in the size group	% of households
Marginal	10	10	100.00
Small	10	11	90.90
Medium	14	16	87.50
Large	13	13	100.00
Total	47	50	94.00

7.6 Impact on NFSM on Area and Production of Pulses

The study revealed that the area of pulses in 2008-09 has increased by 19.11 per cent over the average area of 2006-07 and 2007-08. Crop wise, the area of gram increased by 18.54 per cent, urid by 39.60 per cent and lentil by 19.61 per cent over the same period of reference. However, the area under tur crop registered some decline by 10.53 per cent during this period.

Table 7.5 Area under pulse crops before and after NFSM

Category	**Tur (Kharif)**		**Gram (rabi)**	
	Average of2006-07 and 2007-08	2008-09	Average of 2006-07and 2007-08	2008-09
Marginal	0.21	0.20	2.52	3.00
Small	0.17	0.22	3.46	5.08
Medium	0.84	0.71	14.94	18.12
Large	1.04	0.91	29.08	39.07
Total	2.28	2.04	50.00	59.27
	Lentil (Rabi)		**Urid (kharif)**	
Marginal	0.49	0.84	0.65	1.18
Small	0.53	0.74	1.99	1.61
Medium	2.70	3.00	1.00	1.29
Large	4.07	4.75	1.87	2.28
Total	7.80	9.33	4.52	6.31

The average production of gram during 2006-07 and 2007-08 with all the selected farmers put together was estimated at 607.75 quintals which increased to 884.45 quintals in 2008-09, registering 45.42 per cent increase over the period of reference. The average

production of lentil, the another important rabi pulse after gram was 113.65 quintals in 2008-09 which was an increase of 26.34 per cent over the average production of lentil crop obtained during 2006-07 and 2007-08 (89.95 quintal).

Table 7.6: Production of pulse crop before and after NFSM, district Vidisha

Category	Urid		Gram		Tur		Lentil	
	Average of 2006-08	Average of 2008-09	Average of 2006-8	Average of 2008-09	Average of 2006-08	Average of 2008-09	Average of 2006-08	Average of 2008-09
Marginal	3.87	7.20	27.23	40.08	1.44	1.39	5.98	10.62
Small	5.58	10.71	39.11	74.42	1.76	1.56	5.92	9.17
Medium	6.23	8.01	183.43	255.49	5.89	5.29	29.93	36.39
Large	11.71	15.37	355.83	514.46	7.85	6.93	48.10	57.48
Total	21.26	41.27	607.75	884.45	16.5	15.16	89.95	113.65

Similarly in kharif the average production was estimated 21.26 quintal during 2006-08 which increased to 41.27 quintal this registered an impressive rise by 94.12 per cent, however, the area under this crop was large and farmers started the cultivation of this crop recently. Tur was the only exception which registered a marginal decline in production in 2008-9 as against the average production during 2006-07 and 2007-08.

Table 7.7 Distribution by type of use

(**No** of households by type of use)

Category	Higher yield	Reduced pest attacks	Reduced drudgery	Increased knowledge	Others	Total
Marginal	07	02	--	07	--	100.00
Small	10	--	1	09	--	100.00
Medium	14	01	--	13	--	100.00
Large	11	03	--	12	--	100.00
Total	42	06	4	41	--	100.00
Percentage of Households to total households in size group						
Marginal	70.00	20.00	--	70.00	--	100.00
Small	90.90	--	9.09	81.81	--	100.00
Medium	87.50	6.25	--	81.25	--	100.00
Large	84.64	23.07	--	92.31	--	100.00
Total	84.00	12.00	8.00	82.00	--	100.00

The analysis clearly indicate that selected farmers of NFSM district Vidisha showed a significant increase in area as well as in production of pulse crops in 2008-09 as compared to the average area and production of the same crops during 2006-07 and 2007-08. Thus, it can be concluded that there was a positive and significant impact of NFSM on the farming of pulse crops in the district. However it is also revealed that it was mainly because of gram crop which traditionally not only occupied maximum area of the total pulses farmers having also added more area to this crop. Moreover, the year of 2007-08 was bad for pulses as far as production of pulses in concern. The other crop lentil in rabi and urid in kharif also contributed significantly in the area and production.

7.7 Increase in area under pulses before and after NFSM district Vidisha

The response of the selected farmers of NFSM district Vidisha with respect to increase in the area after imitation of NFSM is presented in the following table 7.8 and table 7.9.

Overall 58.00 per cent farmers of the selected district mentioned an increase in the area under total pulses after the inception of National Food Security Mission (NFSM). Of the total, small farmers, registered the highest increase (63.63) and large farmers registered lowest increase (46.26%) (Table 7.8).

Table 7.8; Increase in area under pulses after NFSM: farmers' perception

	No of farmers who reporting increase	Total no of farmers in the size group	Percentage of farmers
Marginal	6	10	60.00
Small	7	11	63.63
Medium	9	16	56.25
Large	6	13	46.25
Total	28	50	58.00

The estimate relating to extent of increase in area allocation under pulse crops revealed that only 28 out of selected 50 farmers belonging to National Food Security Mission district reported increased area after initiation of the programme of these farmers 75.00 per cent have reported are increase by more than 10.00 per cent under pulse crops 18 per cent reported an increase in the range of 5-10 per cent and 7.00 per cent and reported 2.00 to 5.00 per cent rise in the area.(Table 7.9)

7.8 Distribution by extent of increase: farmer's perception

(No of households by type of use)

	1%-2%	2%-5%	5%-10%	>10	Total
Marginal	--	--	--	6	6
Small	--	--	2	5	7
Medium	--	1	2	6	9
Large	--	1	1	4	6
Total	--	2	5	21	28
% of households to total households in size group					
	1%-2%	2%-5%	5%-10%	>10	Total
Marginal	--	--	--	100	100
Small	--	--	28	62	100
Medium	--	11	22	67	100
Large	--	17	17	66	100
Total	--	7	18	75	100

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CHAPTER VIII

SUMMARY CONCLUSIONS AND POLICY IMPLICATIONS

INTRODUCTION

Though India is a major pulses growing country in the world it has faced the problem of supply and demand gap in pulses since mid-seventies. Depending on the domestic short fall in pulses production, India's net import of pulses have ranged from 1 to 3 million tonnes while exports are one tenth of the volume of imports. The growth in production and productivity of pulses has lagged behind the population growth rate which has resulted in decline in per capita availability of pulses from 61 grams in 1951 to 36 grams in 2007 (42 gram 2008, provisional). The quantity of pulses intake recommended by the Indian council of medical research is about 65 grams per day.

Looking into the importance of pulses in diet, in increasing soil fertility and stagnation in its production, it becomes necessary to find out constraints and outline the prospects for pulses production in the country. Keeping in this view, the Ministry of agriculture, Govt. of India has entrusted the Agro – Economic Research Centre, , Jabalpur a project "**Possibilities and constraints in increasing Pulses Production in Madhya Pradesh and the Impact of National Food Security Mission on Pulses"** with the following objectives.

1. Analyze returns from cultivation of pulses *viz-à-viz* competing crops.
2. Analyze the other major problems and prospects for pulses cultivation.
3. Assess the impact, if any, of NFSM Pulses.

Methodology

Study is based both on primary and secondary data. For the selection of sample farmers all the farmers of selected villages who had grown pulses during the reference years of the study were classified into four size group. From each size group of pulses growers, numbers of farmers were selected at randomly and 50 sample pulses growers were selected from each NFSM district Vidisha and non-NFSM district Sehore. Thus, altogether 100 farmers were selected for the data collection on the basis of discussions with state department officials at Bhopal, Vidisha and Sehore.

General overview of the selected farmers of NFSM district Vidisha & non-NFSM district Sehore

The population of 50 selected household of Vidisha district was 309. Of this, the population of adult male and female was almost equal in number. The total population of children was 116

Average education level of the selected farmers observed to be very high. Eighty six per cent were either literate or attained education up to secondary and above level. Of this, more than three forth i.e. 76.00 per cent were educated up to higher secondary and above level and 10.00 per cent up to primary level. Remaining 14.00 per cent received no education. Under different caste composition 64 per cent households belonged to Other Backward Caste group, 22 percent belonged to general category. The share of Scheduled Caste and Scheduled Tribe was very small and only 6.00 per cent households were belonged to scheduled caste group and 2.00

per cent belonged to scheduled tribes (ST) group. The remaining households belonged to other caste group (6.00 per cent). This clearly indicates that agriculture was mostly in the hands of the farmers belonging to Other Backward Caste community

In the case of non NFSM district Sehore the average family had nearly 6 members per household with 67 per cent adult and 33 per cent children population. Of the total population, 118 were male and 102 were female. The numbers of children were 108. The sex ratio was in favor of male members.

The education status of head of households, presented in the table 3.5 showed that 82.00 per cent of the heads of household having some level of education, of this, 30.00 per cent attained education up to primary level and 52.00 per cent attained education up to secondary level and even beyond that level. Remaining 14.00 per cent household turned out to be illiterate or received no formal education.

In non NFSM district Sehore indicated that farmers were mostly belonged to OBC group shared 58.00 per cent of the total farmers followed by others 22.00 per cent and Schedule Caste 14.00 per cent and 6.00 percent belonged to general category. None of the selected farmers belonged to any Schedule Tribe group.

Land holdings, Area irrigated and cropping pattern.

In the NFSM district Vidisha the total holding area was 196.26 hectares. Of this, 8.82 hectare belonged to marginal 17.13 hectare belonged to small 52.60 hectares belonged to medium and 117.71 hectares belonged to large size group.

In Vidisha, 80.25 per cent area of selected farmers was under irrigation and un- irrigated area was 19.75 per cent. Highest area was irrigated by tube well 66.67 per cent and the other sources together contributed 26.93 per cent to total irrigated area. The area irrigated by community tanks was 6.40 per cent of the total irrigated area.

In non NFSM district Sehore, over 72.14 per cent area was irrigated and remaining 27.86 per cent was rain fed or un – irrigated and of this irrigated area 81.60 per cent was irrigated by tube well alone and 18.40 per cent was irrigated either by wells or rivers/ rive lutes. None of the area was irrigated by tank or canal.

Cropping patterns of selected farmers.

The cropping pattern of the Vidisha district was predominantly soybean pulse wheat pulse based. Soybean was dominant in kharif season and wheat/gram in Rabi season. Pulses also found place in the cropping pattern of the farmer of the Vidisha district.

Cropping pattern of selected farmers showed that soybean occupied 45.38 per cent of the gross cropped area followed by the wheat 29.35 per cent pulses including tur, gram, urad and lentil, together occupied 17.48 per cent. The remaining area was occupied by other small crops which are grown mostly for home consumption only and some small area was allocated to vegetable crops like potato, okra etc.

In the selected NFSM district Vidisha the cropping pattern was predominantly based on soybean crop which occupied 94.48 per cent of total net cultivated area under Kharif season and remaining 3.87 per cent was occupied by kharif pulses like tur and urid. Similarly,

in Rabi season the cropping pattern of selected farmers was seen to be in favors of wheat and pulses

In non NFSM district Sehore the cropping pattern was mostly based on soybean pulse & wheat pulses during kharif and Rabi season respectively. Soybean & wheat accounted for 40 per cent and 36.66 per cent of gross cultivated area respectively. The rest, 23.34 per cent area was under pulse crop 19.06 per cent and other crops 4.28 per cent

Area under Pulses in NFSM and non NFSM districts

In NFSM district Vidisha, the triennium average area under pulses was estimated at 68.71 hectares. Of this area 7.31 hectares (10.69%) in kharif and 61.40 (89.36%) hectares in Rabi season In non NFSM district Sehore, the average area (average of 2006-09) under pulses was registered at 57.17 hectares of this 60.78% pulse area was in kharif and 39.22% was in rabi season

Irrigated area under pulse: NFSM and non NFSM district

In NFSM District Vidisha 61.69 per cent area of gram crop was irrigated whereas, lentil had 39.71 per cent area under irrigation in Rabi season overall, 55.23 per cent of the total area under pulse crops was irrigated

In Sehore, gram had the highest area under irrigation (41.25%) followed by mung (38.19%) in rabi season. In kharif season, tur had 14.59 per cent irrigated area and moong had 28.60 per cent irrigated area. Overall, 38.32 per cent area under pulse crops had irrigation facility.

Profitability of pulse and other crops in NFSM district, Vidisha

In Vidisha district the farmers selected for the study were found to cultivate not only pulse crops but other crops like soybean in kharif and wheat in rabi in a large scale some of the farmers also took some minor crops for their own consumption, for example vegetable “Potato, tomato, lady finger (ocara). Garlic and onion However, their area under there crops was very small and therefore their economics was not attempted.

The average per hectare net return for ***gram crop*** was estimated at Rs.15, 466 in the year 2006-07 which decrease to Rs.13, 665 in 2007-08 and again increased to Rs.21, 819 in the year 2008 - 09. During 2008-09, the highest net return per hectare was obtained on large farms in Rs.22, 712 and lowest was obtained on marginal farms i.e. 17,972. As for net return per quintal the maximum was obtained on medium farmers Rs. 1,504 and lowest Rs. 1,345 on marginal farms in 2008-09. The average value of marketed surplus was estimated at Rs.10, 87,275 in 2006-07, which slightly increased to Rs.11, 33,329 in 2007-08. The average value of marketable surplus was estimated at Rs.18, 74,647 which indicated sharp income over the previous years.

Lentil was another important Rabi pulse crop and farmers grew it with wheat crop as a mix or mono crop as well. In NFSM district, the a significant number of farmers had cultivated this crop though the allocation of area was not very large but still the total area allocated for this crop was significant. The study indicated that the average highest net return per hectare was

24,071 in 2006-07 which increased to Rs.2607 in 2007-08 and further increased to 2720 in 2008-09.

The profitability of ***Tur crop*** in presented in the table 4.3 indicated that average cost and return structure for tur crop different across various categories of selected farmers. The per hectare net return from tur crop cultivated for the average category of farmer was estimated at 12,978 in 2006-07 which declined eighthly to 12,122 in 2007-08 and again increased to 13,296 in 2008-09. The average per quintal net return was estimated at Rs.1, 762 in 2006-07 Rs.1714 in 2007-08 and 1788 in 2008-09. The average per hectare net return for all categories of farmers was estimated at Rs. 13478 in 2006-07 which increased to 18587 in 2007-08 and further increased to Rs. 21208. Similarly per quintal net return was estimated at Rs.2296 in 2006-07 Rs.2994 in 2007-08 and further increased to Rs.3242 in 2008-09. The shop increase in return was attributed mainly to the higher prices received by farmers of urid crop.

During the 2008 – 09 the net return was much higher than the previous years this trend was also observed in net return per quintal On overall basis net return per hectare for ***all the pulses*** was estimated as Rs. 26119 in 2006- 07 Rs. 25538 in 2007-08 and Rs. 33,502 in 2008-09.The return on per hectare and per quintal basis increased during the 2008- 09 over the previous years 2006–07 and 2007-08.

Over all the profitability of the ***Soybean*** crop showed an increasing trend from 2006–07 to 2008- 09 due to continuous support from the market and demand of the crop, on all the size group of sampled farmers a continuous increase in per hectare gross and net return was seen from 2006-07 to 2008-09. Net return on per quintal also registered on increasing trend during the period.

An overall basis, the gross return per hectare came out to be Rs 36048, in 2006- 07 Rs 38874 in 2007-08 Rs 42935 in 2008-09 and net return Rs 25707, Rs 27,798 and Rs 31144 for 2006-07, 2007-08 and 2008-09 respectively. The net return per quintals also showed similar trends and it came out to be Rs 1514 in 2006-07 Rs 1580 inn 2007-08 and Rs 1682 inn 2008-09.

In Rabi season, ***Wheat*** crop is a dominating and occurring majority share in cropping pattern of the selected farmers.

On overall basis the trends of gross return and net return per hectare and net return per quintal were similar to soybean because there crops are well established crops and more over the market support to wheat of Vidisha in well known the wheat of the Vidisha is highly in demand

Profitability of pulses and other crops in Non – NFSM district Sehore.

Gram was the major pulse crop of Sehore district. The average category of sampled farmers of the district showed a net return from gram to the tune of Rs 13,114 in 2006-07, Rs 9066 in 2007-08 and Rs 20,597 in 2008-09. The average category of farmers showed a marginal decline in per quintal net return from Rs 1189 in 2006-07 to Rs 1005 in 2007-08. However, the net return per quintal again rose to Rs 1434 in 2008-09.

The farmers registered relatively lower return from lentil crop cultivated during Rabi season. Since per hectare return from lentil crop was Rs 12876 in 2006-07, Rs 15447 in 2007-08 and Rs 18294 in 2008-09. However, the net return per quintal was Rs 1896 in 2006-07, Rs 1991 in 200- 08 and Rs 2080 in 2008-09.

The per hectare net return from ***Tur crop*** for the average category of farmers belonging to Sehore district was established Rs 8817 in 2006-07, Rs 9181 in 2007-08 and in 2008-09. The per hectare net return registered a decline over 2007-08 and it was established at Rs 8936. The average net return per quintal also registered the same trend and it was Rs 1523 in 2006-07, Rs 1544 in 2007-08 and Rs 1459 in 2008-09.

The value of per hectare marketed surplus was found to increase from 156494 in 2006-07 to 157857 in 2007-08. However, during 2008-09 the value of marketable surplus registered a significant increase over 2006-07 and 2007-08 and it was estimated at Rs 22,1,700.

The profitability of ***Munq crop***, gross return showed a decline in 2007-08 over the year 2006-07. However, this again increased significantly in 2008-09. The net return per hectare showed a decline in 2007-08 over the net return of 2006-07. However, this increased again in 2008-09. The table farther showed that net return per quintal showed a significant decline in 2007-08 and 2008-09 over the period of 2006-07.

In non–NFSM district Sehore the major crops during kharif and rabi season were **Soybean** and **Wheat** respectively and the cropping pattern of the selected sampled farmers also depend on these two crops.

In ***Soybean*** farming the gross return per hectare decline in the year 2007-08 and 2008-09 over the gross return received in the year of 2006-07, on all the farm size category the gross return per hectare was Rs 40,043 in 2006-07, Rs 39,500 in 2007-08 and Rs 30721 in 2008-09. The net return per hectare was Rs 28,332 in 2006-07 which declined to Rs 26981 in 2007-08 and Rs 26, 549 in 2008-09. As far net return per quintal basis the farmers received almost same amount in 2006-07 and 2007-08 which further declined to Rs 1,526 in 2008-09.

On an overall basis, gross return per hectare, net return per hectare and net return per quintal has registered an increasing trend over the years for ***all the pulses***. The gross return per hectare came out to be Rs 46, 346 in 2006-07, Rs 49559 in 2007-08 and Rs 50, 394 in 2008-09. The net return per hectare came out to be Rs 31, 893 in 2006-07 Rs 34, 049 in 2007-08 and Rs 34433 in 200- 09. Similar trend was also observed in net return per quintal and this came out to be Rs 808 in 2006-07, Rs 850 in 2007-08 and Rs 895 in 2008-09 this trend was also observed by the medium and large size farmers, whereas the marginal farmers observed as decline in 2007-08.

Area under improved varieties of pulses in NFSM & Non NFSM districts

In NFSM district Vidisha, tur crop was mainly grown for household consumption and most of the farmers (80%) grew traditional varieties but the preference for varieties for other pulses was entirely different as 100 per cent farmers of urid crops 81.25percent of gram crops and 75percent sampled farmers of lentil crop in reported area under improved varieties

The area under improved varieties of tur crops as proportion to total area under that particular crop was 38.64 per cent. As far urid crop the entire area under this crop was covered by improved varieties. The proportion under improved verities to total area of that crop with respect to gram was 77.27 per cent as some of the selected farmers still prefer local or *deshi* gram over improved one. Lentil was another pulse crop with reported area under improved varieties was 81.95 per cent.

The above information clearly indicate that farmers of NFSM district Vidisha had preferred improved varieties of all the pulse per cent tur despite some problems in their cultivation.

In non NFSM District Sehore, nearly 70 percent area of total pulses was covered by improved varieties. Crop wise data showed that 86.49 percent area of gram, 85.75 percent area of lentil and 66.66 percent area were under improved varieties. In the case of tur crop the area under improved varieties was comparatively less as on 41.38 percent area was under improved varieties.

Source of knowledge of improved varieties

The major source of knowledge regarding improved varieties of pulse crops were extension agents of State department agencies working in the area, neighbor, paper or other media and other source in both the districts.

Recommended practices:

In Vidisha and Sehore, majority of the farmers adopted sowing practices as per the recommendation. The percentage of adoption of other cultivation practices like application of fertilizers, manures use of organic manners pest/ plant protection measures etc. was also very high and farmers followed one or other practices recommended for the cultivation of pulses.

Problems with improved varieties

In NFSM district Vidisha, most of the farmers faced two major problems as rank I while cultivation of ***Tur*** crop. Half of the farmers reported that yield of the crop was much lower than the expectation. The other forty per cent farmers reported that the required seed was not available on time.

In the category of second most important problem (rank 2) with improved varieties, forty per cent farmers reported improved seed varieties of the ***Mung*** crop was available but not on time which again a large number (30 per cent) ranked other problem of lower yield than expected as ranked 2. Twenty per cent farmers felt that this crop needs large doses of other inputs and ranked it as II. In the 3rd most important rank, sixty per cent of the farmers reported that untimely availability of improved varieties of seed affected the production of the mung crop.

Unavailability of pest resistant varieties of ***gram*** crop was major single problem. The much lower yield than expected was reported as rank 1 by 30.61 per cent farmer. A significant number of farmers were also opined that improved varieties of gram need large doses of other inputs like fertilizer/ chemicals etc. In rank 2 category, it was again the problem of resistance not adequate received higher note and 38.78 per cent farmer noted in the favors of this problem followed by seed long dose of other inputs (28.57%) and much lower yield that expected (26.53%). The 3rd most important problem was that the gram needs higher doses of inputs

Of the 50 farmers who grew pulses 20 had also taken lentil crop during 2008-09 and of these 20 lentil farmers a significantly large percentage of farmers reported pest resistance not adequate of improved variety as the most important problem and 30 per cent mentioned a much lower yield than expected as major problem. As far as second most important problem is concern 55 per cent farmers found much lower yield than expected followed by pest resistance

not adequate (60%) given 2nd ranking. It can be seen that availability was not a major problem and this problem did not find place in first four important places and not available on time and not available at all were the problems reported as 5th with 65 per cent and 6th with 85 per cent respectively.

In Vidisha district ***Urid*** was the 3rd major pulse crop after, gram and lentil. The problem relating to much lower yield than expected was assigned 64.72 per cent households followed by need large doses of other inputs with 23.53 per cent as 1st ranking. The second most important ranking was assigned to availability but not in time, by 35.30 per cent followed by much lower yield then expected by 29.41 per cent and large doses of other inputs 23 53 per cent. Similarly, at the 3rd ranking 35.29 per cent farmers reported that improved varieties of this crop need large doses of other inputs followed by expensive nature of improved varieties and pest resistance not adequate with 23.53 per cent each.

In the non NFSM district Sehore majority of the ***Tur*** farmers reported the problem relating to pest resistance not adequate as number one ranking and second most important problem faced by farmers that improved varieties of was that this crop needs large doses of other input. Much lower yield than expected was another major problem faced by the farmers and acquired IInd ranking Farmer ranked 3rd to much lower yield than expected. Expensiveness of the improved varieties of tur crop was ranked IV.

As for the cultivation of improved varieties of ***Mung*** crop the farms belonging to the households of non NFSM district of Sehore, the problem relating to pest resistance not adequate was major problem followed by much lower yield than expected and available but not in time equally. The 3rd most important problems were shared equally by that this crop needs large doses of inputs and very expensive nature of seeds.

In ***Lentil*** cultivation, farmers reported that improve varieties were not adequately resistant to pests and diseases as number one problem. Another 30 percent reported a much lower yield than expected as major problem. The second most important problem was lower than expected yield followed by poorly resistant to pest and disease. Availability was not a major problem and this problem did not find place in 4 most important problem related to improved varieties of lentil.

As far the cultivation of improved varieties of gram crop the problem relating to pest resistance not adequate was the most important problem accounted by the farmers followed by problems relating to lower yield than expected and untimely availability of seeds Some farmers also felt that it was poor yield than expected was second most important problem.

In can be seen from the table the cultivation of improved varieties of gram crop also needed higher doses of other inputs and 32.43 per cent farmers have given 4th ranking to this problem another problem like untimely availability of seed with 29.72 and higher cost of seed with 24.32 per cent also acquired 4th ranking among all the problems non available was not a major issue, as far as cultivation of gram crop was concerned the farmers of 2nd NFSM district, Sehore.

The major problem with respect to improved varieties of mung, tur, lentil and gram on in the entire crop was pest resistance or pest resistance was not adequate. However, the problem

related to poor yield than expected was also a major problem in the cultivation of improved varieties of pulse crops.

Suggested solutions for improved varieties in NFSM and Non NFSM districts

Subsidy was the major issue to overcome the various problems faced by the farmers of both the districts. The cheaper and timely availability were the other suggested solutions.

Marketing of pulses in NFSM District Vidisha

Marketing pattern of selected farmers of ***gram*** revealed that farmers preferred regulated market and commission agent over other channels for marketing of their produce, in Vidisha 96% farmers sold their produce through there channels, while in 2008-09 98% produce sold was rooted through these channels. During 2007-08 the share of village market was only 2% while in 2008-09 none of the farmers reported any quantity sold through this channel. The share of other channels including neighbors, friends, and relatives was same (4%) during 2007-08 and 2008-09.

Lentil is another pulse crop of rabi season. In this crop, like gram crops, majority (72%) of the total lentil producing farmers sold their produce in regulated market while 80% medium and 100% large sold their lentil in regulated market. It is clear from this table that 100% small, 50% of marginal, 20% medium farmers also preferred commission agents. In 2008-09 the share of produce sold in regulated market rose to 95% among different categories 33 percent small farmers also sold the marketable quantity to commission agent.

Tur crop is mainly grown for home consumption. However, some quantity was also sold in market. Overall entire produce was sold in regulated market in 2007-08, 43% each was sold either to commission agent or in regulated market. Village market also contributed 14% to total percentage of produce sold.

In 2007-08 all the marginal and small farmers sold ***urid*** in village market. On the contrary all the medium and large farmers sold their urid crops to commission agents. In 2008-09 the marginal farmers sold their produce in village market. While 50 per cent sold to commission agent, 25 per cent small farmers sold in village market while 75 per cent opted commission agent in 2008-09. Overall 53 per cent in 2007-08 and 82 per cent in 2008-09 farmers preferred commission agent for selling of urid crops.

Quantity of pulses sold through various channel, NFSM District Vidisha

In case of NFSM district Vidisha, the quantity of gram sold through regulated market was 97 percent followed by commission agent 2.10 percent and village market 0.67percent during the year 2007 – 08. In 2008-09 the quantity sold through regulated market increased to 98.54% followed by other means 1.46 % and commission agent 0.48% this clearly indicates that the farmers particularly large and medium mostly preferred regulated market for selling their produce and very few sells to local market or to commission agents.

Even small and marginal farmers sell their produce in *Mandies* or regulated market through forming a group or cartel or by help of other large farmers for better price for their produce especially for crop like soybean, gram, lentil and wheat etc.

The quantity of Lentil sold through regulated market was 84.34 per cent followed by sold through commission agent, 13.25 per cent and through village market 2.41. In 2008-09 the quantity sold through regulated market was raised to 96 per cent. It is very clear that farmers

received higher price for their produce in regulated market as compared to price paid by commission agent.

In contrary to gram and lentil market, where farmers sold their produce mainly to regulated market, ***Tur*** was sold mainly through commission agent or in village market itself because of little marketable surplus of tur crop and in 2006-07 the tur sold through commission agent was 50 per cent followed by through village market 37.5 per cent and remaining was sold to others including relatives friends etc. In 2008-09 the quantity sold through commission agent raised and the entire marketable surplus was purchased by commission agents only.

In the case of ***Urid*** crop, the entire quantity was sold through commission agent and through village market only. Of the total quantity produce 61.54 per cent quintals was sold through commission agent and remaining 38.46 percent was sold in village market itself in 2007-08. In 2008-09 the quantity of surplus Urid increased and 84.61per cent was sold through commission agent and only 15.39 per cent was sold in village market.

MARKETING OF PULSES IN NON –NFSM DISTRICT SEHORE

In case of gram in non NFSM district Sehore 76 per cent of ***gram*** crop was sold through regulated market. The other channels adopted by the farmers were commission agents and village market 12 per cent each in 2007-08. It may be noted that marginal farmers did not sell any quantity in regulated market and sold mostly in village market and through commission agent 50 per cent each. Large farmers preferred regulated market 100 per cent. In 2008-09 also 79 per cent farmers sold in regulated market. However the percentage of farmers who sold their produce to commission agent increased to 16 percent over the year 2007-08. The remaining, mostly marginal, preferred village market 5 per cent.

In case of ***lentil*** crop in 2007-08, 76 per cent of selected farmers of non NSFM district Sehore sold their lentil crop through regulated market which was easily accessible to them. In the same year the share of commission agent and village market in total quantity sold through various sources was 16 per cent and 8 per cent respectively. In 2008-09 the entire marketable surplus of lentil crop was sold only through regulated market. The farmers did not prefer any other channel in this year.

in case of the ***tur*** crop which was normally grown in rain fed marginal land, for household consumption and for their purpose like making roof, broom, etc. the farmers sold their marketable surplus through regulated market 52 per cent followed by, through commission agent and village market 24 per cent each in 2007-08. However, in 2008-09 the number of farmers who sold tur in regulated market declined marginally to 47 per cent. The share of village market in total quantity sold increased by 5 per cent over last year. The remaining 24 per cent still preferred commission agent.

In Sehore, some of the farmers started cultivating ***mung*** recently and therefore, very little surplus production was available for marketing. However, during both the year 78% mung was sold through commission agent and remaining 22% sold in village market.

QUANTITY OF PULSES SOLD THROUGH VARIOUS CHANNELS IN NON NFSM DISTRICT SEHORE:

In case of marketable surplus, the ***gram*** sold through regulated market was 88.72% followed by commission agent (7.5%) and village market (3.76%).None of the farmers sold any quantity to friends, neighbors and relatives .In the year of 2008-09 the quantity of marketed surplus increased substantially and 86.9% was sold in regulated market. Some quantity was also sold to commission agent (12.36%) and in village market (0.23 %).

In case of ***lentil*** during 2007-08 the quantity of marketed surplus of lentil sold through regulated market was 87.5% followed by commission agent (10.42%) and village market (2.8%). Farmers had not sold any quantity to either government or to any friends, relatives, etc. In the year 2008-09, the quantity sold through regulated market increased to 61quintals and the entire marketed surplus was sold through regulated market only.

In case of ***tur*** crops, in 2007-08 the selected farmers also sold 61.55% through regulated market and 21.15% through commission agents. The remaining 17.30% was sold in village market itself. In 2008-09 the total quantity sold through these channels witnessed a substantial increase across the board. Of the total quantity of marketed surplus, 61.33% was sold in regulated market, followed by 20% in village market and remaining 18.67% through commission agents.

In case of ***munq*** crop, the total quantity of marketed surplus in 2006-7 was only 11quintals. Of this, 81.82% was sold through commission agents and remaining 18.18% to village market. In 2008-09 the situation remained the same. In this year also no farmers belonging to marginal and small categories reported any quantity of mung marketed. They retained the small quantity for house hold consumption.

Extent of Government (NAFED) Procurement of Pulses :

From farmers of NFSM and non NFSM districts it was observed that none of the selected farmers belonging to NFSM district Vidisha and non -NFSM district Sehore sold any quantity of their pulses to government agencies like NAFED and therefore, the procurement was nil in these selected districts.

Reasons for growing pulses in NFSM and Non NFSM district

The analysis indicate that farmers were cultivating pulses for many reasons: but the most important reason was to gain more income out of it. In both the district profitability was found to be the major determinant for cultivation of pulses. Sixty per cent in Vidisha (NFSM) district and 54 per cent in Sehore, (non NFSM district indicated profitability as major reason. The other important reasons which influenced farmers to cultivate pulses were lack of assured irrigation. Cultivating pulse for household consumption was also an influencing reason. Extent of irrigation was the main criteria for deciding the allocation of area under various pulse crops followed by rain fall suitability of land and home consumption. Since land quality was not poor so this was not the deciding factor

In both the districts, farmers have cited low yield as the main reason for low area under pulse most of these farmers informed that even improved varieties have failed to give higher on expected yield. Infestation of pests and insects was another important reason and 26 per cent

farmers expressed this problem as a factor followed low profitability by instability in yield and price

Normally, farmers allocate inferior quality of land to crops like pulses or crops which do not need high investment but still give good yield and return. In NFSM district Vidisha farmers found to cultivated mostly coarse cereals like maize millets, pulses and in some extent superior quality cereals also. In non NFSM district, Sehore the inferior quality of land was not only used for pulse but the crops like maize coarse cereals in rabi and oilseed like soybean in kharif season were also cultivated of the total selected farmers

The quality and yield of a crop is generally depend on the quality of land if the quality of land is inferior than the yield and quality of both yield and quality of seed will definitely detention ate significantly. The response on this, most of the selected farmers of Vidisha and Sehore district reported that the quality and well as yield suffered when they cultivate pulse on such lands.

Very few farmers reported shifting of land under pulses to other crops just because of poor yield of pulse crop

Study revealed that all the farmers of Vidisha and Sehore were not only willing to grow pulse but also willing to expand the area, under pulses if government ensuing an assured procurement mechanism and competitive price as well.

Major problems in cultivation of pulses

Major problems that were affecting the production of pulses in the pulse production in general were high incidences of attack of pests and diseases, lack of irrigation facilities; improved varieties having lower yield, need of high doses of inputs or high production cost losses due to insect's pests and diseases and low market prices. To overcome such problems farmer suggested that availability of pest and disease resistant varieties should be made available, improving irrigation facility would also reduce the problem of pulse cultivation. Ensuring availability of HYV was also suggested by good number of farmers as first ranked suggestion.

Impact on NFSM on Area and Production of Pulses

The study revealed that the area of pulses in 2008-09 has increased by 19.11 per cent over the average area of 2006-07 and 2007-08. Crop wise, the area of gram increased by 18.54 per cent, urid by 39.60 per cent and lentil by 19.61 per cent over the same period of reference. However, the area under tur crop registered some decline by 10.53 per cent during this period.

The average production of gram during 2006-07 and 2007-08 with all the selected farmers put together was estimated at 607.75 quintals which increased to 884.45 quintals in 2008-09, registering 45.42 per cent increase over the period of reference. The average production of lentil, the another important rabi pulse after gram was 113.65 quintals in 2008-09 which was an increase of 26.34 per cent over the average production of lentil crop obtained during 2006-07 and 2007-08 (89.95 quintal).

Suggestion for improving NFSM – Pulses:

In order to improved and make national food security mission more useful the farmers selects for their. Study have put forth. Number of suggestion these suggestions. Can be categorized as below:-

1. Subsidy should be provided for purchasing of inputs like seeds Specially Seeds.
2. All the Seeds of pulses should be resistant to diseases like wilt, root rot, pod borer etc as these were their major problems all most al the farmers encountered.
3. Varieties should also be resistant to attack of various insects like white fly, Jassids etc.
4. Farmers also suggested that varieties should be germination as certified because most of their farmers found the yield of improved varieties were less than the expected yield.
5. Shortage of electricity is a big problem. Proper and timely availability of electricity should be ensured by Govt.
6. Shortage of fertilizers is also a bigger concern and should be provided in enough quantities on time.
7. Insurance cover should be extended to farmers against any losses.
8. Timely availability of seed was not a major problem but quantity of pulse verities should be ensured.

Policy implications:

1. The state shows the positive impact of NFSM in Vidisha district due to increase in area and production.
2. Madhya Pradesh state is one of the important pulses crop growing state of the country. It is true that state agriculture is predominantly wheat and paddy based but farmers are still interested in growing pulses as a profitable venture. And to encourage their intention the state Govt show come out with an agriculture policy which ensures the market for the pulse crops and provide stability in pricing against price fluctuations.
3. Farmers of the pulses are generally growing gram as this needs less water and can grow in water stress condition successfully. However, more varieties with high yields realized on should be developed. For water stress condition varieties should be short duration one.
4. Urad and lentil are another pulse which are coming up in recent years in kharif and rabi season respectively and can provide good support to farmers encourage but since there are coverage is very less as compared to gram crop and therefore a good variety of short duration is the need of the time.
5. Tur crop is another kharif pulse crop and most of the farmers grew it for home consumption because high yielding varieties are still not available in the market.
6. Most of the farmers reported incidence of more than one insect & pest attack. Pod borer, pod fly, wilt, root rot were the major pest and diseases reported by the farmers of selected district. Integrated pest management (IPM) and NFSM mission will definitely provide the relief against such attack and will minimize the yield losses.

7. Unavailability of laboures was also a problem during the important operations like crop cutting threshing etc. because of rural people are busy in MGNREGA project which provide an assured income and employment.
8. Irrigation was an important issue relied by the farmers most of the farmers suggested that the assured electricity supply when needed will increased the pulse production manifolds.
9. Availability of fertilizers like urea and DAP in time was also a reported concerned by the farmers. Therefore, Govt should ensure the timely availability of sufficient quantities of fertilizers at subsidized rate.
10. Lastly the assessment of impact of NFSM on pulses production is not possible on the basis of performance based on one or two years as the programme was started in 2007 – 08. Therefore, its real impact should be asses only after five years of its imitation.

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