

Study No. 134

Publication No. 181

Possibilities and Constraints in Increasing Pulses Production in Uttar Pradesh and the Impact of National Food Security Mission on Pulses



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2011

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Preface

The National Food Security Mission (NFSM) was launched in the year 2007-08 as a centrally sponsored scheme by Govt. of India after the resolution passed by the National Development Council on 25th May, 2007. The NFSM comprises mainly three components i.e. (1) NFSM-Rice, (2) NFSM-Wheat and (3) NFSM-Pulses. The main objectives of NFSM were to raise the production level of rice, wheat and pulses by increasing area and yield in a suitable manner, to restore soil fertility and productivity of individual farms, to create employment opportunities and to enhance economy of farms. In the country as a whole 136 districts were included in NFSM-Rice, 141 districts in NFSM-Wheat and 171 districts in NFSM-Pulses.

In the state of Uttar Pradesh about 75 percent of its population directly depend on agriculture which accounts for 31 percent of GDP in the state. This state ranks first in the production of total foodgrains, wheat, potato, vegetables, sugarcane as well as milk and second in the production of pulses and rice. Thus, this state has the capacity to meet the challenges of livelihood security of not only its own but of the whole country. In this state the action plan under the National Food Security Mission was implemented under 3 district components i.e. (1) NFSM-Rice (26 districts), (2) NFSM-Wheat (38 districts) and (3) NFSM-Pulses (19 districts). Out of the 19 districts under NFSM-Pulses 7 fall in Bundelkhand Region, 5 in Eastern Region, 4 in Western Region and only 3 in the Central Region of the state.

In order to assess the impact of NFSM-Pulses on returns from pulses cultivation and future prospects of pulses in the state of Uttar Pradesh, this research study entitled “Possibilities and Constraints in Increasing Pulses Production in Uttar Pradesh and the Impact of National Food Security Mission on Pulses” was undertaken by this centre at the statistics, Ministry of Agriculture, Govt. of India. The main objectives were to analyze returns from cultivation of pulses vis-à-vis competing crops and major problems and prospects for pulses cultivation and to assess the impact, if any of NFSM-Pulses.

This study reveals that in Uttar Pradesh foodgrains are given much importance and among foodgrains Wheat and Rice are given important places in G.C.A. Pulses also covered above 10 per cent of G.C.A. Gram and Lentil together had covered about half of the total area under pulses

in this state. Urd, Arhar and Pea also covered considerable area. In case of Moong there was tremendous decrease during the reference period. The response of technology adoption was better in NFSM district Lalitpur. But in Non-NFSM district Allahabad it was discouraging. In both the district i.e. Lalitpur as well as Allahabad low yield including poor grain quality was the main problem of pulses growers. The next important perception was that pulses are grown generally on inferior quality and poor land across the state of Uttar Pradesh.

This study had been undertaken by Sri. S.N. Shukla and Dr. H.C. Malviya of this centre. Dr. Rajendra Singh (Rtd. R.O.) and Sri D.K. Singh (Rtd. R.O.) drafted the report and its executive summary.

Since presently there is not a single R.O. to look after the drafting etc., I therefore, take this opportunity to thank all the persons involved in preparation of this report. I thank Dr. S. Jain for her help in the statistical analysis. I also express my deep sense of gratitude to all the concerned officials at the state, region, district, block and village level and sample farmers for extending their ungrudging cooperation without which this study would have not been possible. I am also grateful to Dr. C.S.C. Sekhar, Associate Professor, IEG, New Delhi for his valuable guidance to carryout the study in a scientific way.

Any comments and suggestions for the improvement in the report are solicited and will be acknowledged thankfully.

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Field Survey, Tabulation, Analysis of Data

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Secretarial Services
Secretarial Services

Photocopy of the Report

Support Service
Support Service

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CHAPTER -I

INTRODUCTION

I.1. Brief Background of the study:

Although cultivation of pulses holds an important place in the farming systems of our country, the production of pulses lags much behind the increasing demand of pulses by the people. The share of pulses in total food grains production has declined continually resulting in the reduction of net availability of pulses from 60 gm/day/ capita in 1950-51 to 31gm/day/capita in 2007-08 against the recommended level of 80gm. by F.A.O./W.H.O. and 43 gm./day/capita by I.C.M.R. (Indian Council of Medical Research). This trend was due to dismal production performance of pulses in comparison to population growth. The country was compelled to import pulses due to acute shortfall in supply. This occurred despite the fact that several pulses development programmes were initiated in the past to meet-out the increasing demand of pulses due to continuously increasing population in the country. The share of pulses in total food grains production has declined from 10.90 per cent in 1970-71 to 7.33 per cent in 1991-92. The main reason for this declining trend was stagnation in production of pulses on the one hand and growth in population on the other. The major constraints responsible for slow growth of pulses in India may be broadly classified into (i) ecological constraints, (ii) research constraints and (iii) socio-economic constraints (V. Prasad et. al, 1993). As a result of poor performance of production and increasing demand for pulses due to high growth of population, the per capita annual availability of pulses was as low as 2.1kg. in Assam as against 14.1kg. in the country as a whole in 1991. Rice still is the dominant crop, occupying more than 70 per cent of the crop land against 4 per cent under pulses in the state (K.K. Barman et. al. 1993) Orissa is one of the important pulses growing states and it accounted for 8.29 per cent of the total acreage under pulses in India and for 5.8 per cent of the national output in 1988-89. There has been a shift in area from pulses to more remunerative crops in Puri district where as both area and production of pulses have increased considerably in Dhenkanal district. There was wide instability in the area, production and productivity of pulses in the state (Devdutt Behnra et. al. 1993). Pulses are grown over an area of 23 million hectares with a production range of 13 – 14 million tonnes. The main pulses producing states are Madhya Pradesh, Maharashtra, Orissa, Rajasthan and Uttar Pradesh which

together accounted for about 68 percent of the total production in the country. Uttar Pradesh covered a maximum area of 4.34 million hectares in 1950-51, with a share of 23.4 per cent in the total area under pulses in the country. The increase in minimum support prices from year to year was very marginal when compared to the prices in the open market. Constraints identified are lack of adequate supply of improved seeds, lack of drought tolerant varieties, lack of varieties resistant to diseases, lack of varieties suitable to salinity conditions, shifts from pulses to other lucrative and competing crops, improved post harvest technology and remunerative prices as well as marketing support (I. Narender et. al. 1993).

There has been an absolute decrease in the area under pulses over the 15 years (1971-86). This has been largely due to a sharp decline in the area under both irrigated and un-irrigated pulses on large holdings and also due to decline in unirrigated area on medium holdings. The farmers of almost all size groups have turned to water intensive and cash crops which yield higher net returns per hectare compared to pulses. During these years various incentive schemes including minimum support price and area development programmes have not helped much in increasing the acreage under pulses (B.L. Kumar, 1993). Pulses are finding new niches. Most of the pulses have moved from traditional to non-traditional areas. Although the overall performance of different pulses was dismal, their prospects in new niches seem to be quite promising. It is therefore, critical to delineate the promising niche for each pulse crop and introduce appropriate technology and create favourable environment through policy support. Simultaneously, the potential of improved technologies also need to be tapped. The existing low profile pulses research and extension programme need to be overhauled to bring yellow revolution in pulses sector (P.K. Joshi et. al. 2002).

I.2. National Programmes for Development of Pulses in India:

The Centrally Sponsored Pulses Development Scheme was launched during fourth plan (1969-70 to 1973-74) introducing new production technologies and improved varieties among the farmers. Again during the post green revolution period the National Pulses Development Programme was initiated in the year 1986 with the same aim of introducing further improved technologies to the farmers covering almost 13 states of India. Seeing the success of National Pulse Development

Programme a Technology Mission on Oilseeds as well as Pulses was introduced in 1986 to boost the production of oilseeds and pulses in India. This programme was launched from seventh plan onwards. Further to supplement the efforts made under National Pulses Development Programme a special Food Grains Production Programme on pulses was also implemented during 1988-89 on the basis of 100 per cent assistance by the Central government. In 2007-08 the National Food Security Mission (NFSM -2008) on pulses replaced all the existing pulses related programmes with the main aim of increasing the pulses production in the country by 2 million tonnes till the end of 2011-12.

I.3. Trends of Production of Pulses and Main Competing crops in India During 2001-09:

The scanty data contained in table-I-1 reveal that pulses production in India during 2001-02 to 2008-09 remained stagnated around 13 million tonnes with slight variations in 2002-03 and 2003-04. This phenomenon compelled G.O.I. for consistent import of pulses. The main reason behind this stagnation seems to be the stagnation in the production of wheat estimated around 72 million tonnes as main competing crop in the country as a whole. While the production of rice as another competing crop in the country has fluctuated between 71 million tonnes to 93 million tonnes during the same span of time which also supported stagnation in the production of pulses. The production of oilseeds has found to be increased considerably in the country. The production of coarse cereals has been found varying from 26.07 million tonnes during 2002-03 to 37.60 million tonnes in the year 2003-04 and thereafter showed a decreasing trend.

Table-I-1

Trends of Production of Pulses and main competing crops in India (2001-2009)

Years	Production in (Million Tonnes)				
	Wheat	Rice	Pulses	Oilseeds	Coarse Cereals
2001-2002	72.77	93.34	13.37	20.66	33.38
2002-2003	65.76	71.82	11.13	14.84	26.07
2003-2004	72.16	88.53	14.91	25.19	37.60
2004-2005	68.64	83.13	13.13	24.35	33.47
2005-2006	69.35	91.79	13.39	37.98	34.07
2006-2007	75.81	93.36	14.20	24.29	33.92
2007-2008	78.57	96.69	14.76	29.76	40.75
2008-2009	80.68	99.18	14.57	27.72	40.04

Source: agriculture Statistics at a glance 2010. Directorate of Economic & Statistic, Department of Agriculture and Cooperation, Ministry of Agriculture, Govt. of India, New Delhi

I.4. Recent Trends of Area, Production and Productivity of Important Pulses in Uttar Pradesh during (2006-2009):

The recent trends of area, production and productivity of important pulses in Uttar Pradesh during 2006-07 to 2008-09 worked out in Table-I-2 reveal that the area under Moong (kh.) increased from 32.6 thousand hectares in 2006-07 to 39.1 thousand hectares in 2007-08 which suddenly decreased to 30.5 thousand hectares in 2008-09 in the state. While the production of Moong (Kh.) decreased from 12.6 thousand M.T. in 2006-07 to 8.3 thousand M.T. in 2007-08 and 11.3 thousand M.T. in 2008-09 respectively. Accordingly yield also decreased in the same proportion. In case of Arhar the area decreased continuously but yield increased with slow pace. In cases of Gram, Lentil and Pea also the area decreased but yield increased slightly. The area of Urd (Kh.) increased but yield decreased proportionately. The related data are given in Table-I-2.

Table-I-2

Recent Trends of Area, Production and Productivity of Important Pulses in Uttar Pradesh during (2006-2009)

Unit: (Area in Hect., production in M.T., productivity in Qtl./Hect.)

APY of Important Pulses	Years		
	2006-07	2007-08	2008-09
Moong (Kh.)			
Area	32598	39747	30518
Production	12602	8277	11286
Productivity	3.87	2.08	3.70
Arhar			
Area	386732	369884	314785
Production	284585	325099	287720
Productivity	7.36	8.79	9.14
Gram			
Area	654708	554653	554434
Production	486973	405845	561508
Productivity	7.44	7.32	10.13
Lentil (Masoor)			
Area	591163	465349	520736
Production	419824	354471	459705
Productivity	7.10	7.25	7.62
Pea			
Area	371656	245100	351030
Production	364283	261855	423753
Productivity	9.80	10.68	12.07
Urd (Kh.)			
Area	344446	507745	362921
Production	198492	218349	195349
Productivity	5.76	4.30	5.38

Source: Dte. Of Agri., Uttar Pradesh, Lucknow

I.5. National Food Security Mission in India:

The national food Security Mission (NFSM) was launched in the year 2007-08 as a centrally sponsored scheme by Govt. of India after the resolution passed by the National Development Council on 29th may, 2007. The NFSM comprises mainly three components i.e. (1) NFSM – Rice, (2) NFSM – Wheat and (3) NFSM – Pulses. The NFSM was initiated with the main objectives such as (i) To raise the level of production of rice, wheat and pulses by increasing area and productivity in a sustainable manner, (ii) To restore the soil facility and productivity of the individual farms, (iii) To create employment opportunities and (iv) To enhance the economy of farms for restoring confidence among the farmers. To achieve these objectives the following strategies have been formulated i.e. (1) Implementation of scheme in a mission mode approach through active engagement of all the stakeholders at various levels, (2) Extension and promotion of improved technologies in respect of seed, integrated nutrient management (INM) including micronutrients, soil amendments, integrated pest management (IPM) and resource conservation technologies including capacity building of the farmers, (3) Close monitoring of the flow of funds by ensuring its reach to the target beneficiaries timely, (4) Integration of various proposed intervention with the district plan and fixing target for each identified district and (5) Constant monitoring and concurrent evaluation to assess the impact of the intervention by the implementing agencies.

In the country as a whole 136 districts were included in NFSM – Rice, 141 districts in NFSM – Wheat and 171 districts in NFSM – Pulses. Because production of pulses has remained stagnated in India for the last more than four decades, the larger numbers of districts are included under NFSM – Pulses.

I.6. National Food Security Mission in Uttar Pradesh:

In the state of Uttar Pradesh about 80 per cent of the total population reside in rural areas of which about 75 per cent directly depend on agriculture which accounts 31 per cent of GDP in the state as a whole. The state ranks first in the production of total food grains, wheat, potato,

vegetables, sugarcane as well as milk and second in the production of pulses as well as rice in the country. Thus, this state has capacity to meet the challenges of livelihood security of not its own but of the whole country.

In this state as a whole the action plan under the National Food Security Mission has been implemented under three distinct components i.e. (1) National Food Security Mission – Rice (26 districts), (2) National Food Security Mission – Wheat (38 districts) and (3) National Food Security Mission – Pulses (19 districts). Among the 19 districts undertaken under NFSM – Pulses, Lalitpur is such a district in which the area under pulses increased from 2.02 lakh hectares during 2006-07 to 2.87 lakh hectares in the year 2009-10. Also out of these 19 districts 7 districts fall in Bundelkhand Region, 5 in Eastern, 4 in Western and only 3 districts in central region of the state.

Keeping the above cited facts in view at the instance of the Directorate of Economics and Statistics, Ministry of Agriculture, Govt. of India this research study entitled “Possibilities and Constraints in Increasing Pulses Production in Uttar Pradesh and the Impact of National Food Security Mission on Pulses” was undertaken to assess the effectiveness of NFSM – Pulses on the pulses production in Uttar Pradesh with the following specific objectives:

I.7. Objectives of the Study:

1. To analyze returns from cultivation of pulses vis-à-vis competing crops.
2. To analyze the other major problems and prospects for pulses cultivation.
3. To assess the impact, if any, of NFSM – Pulses.

I.8. Methodology:

I.8.1. Method of Study:

This study was confined to the state of Uttar Pradesh as a whole. A multistage stratified mixed sampling technique was used to choose the samples. One district each from NFSM and Non-NFSM groups of districts were undertaken purposively on the basis of maximum area under

pulses. From these two districts thus, undertaken one block from each district was selected on the same basis. Thereafter, one village from each of the two blocks thus, selected was selected randomly on the same criteria. From these two villages thus chosen separate lists of pulses growers were taken. These lists were further categorized into four size-groups i.e. (1) Marginal farmers, (2) Small farmers, (3) Medium farmers and (4) Large farmers. Thereafter, 50 farmers from each selected village were chosen randomly according to probability proportion to the total number of farmers in each size-group restricting the ultimate samples to 100 in total. From these samples data in respects of costs, returns problems and prospects etc. were collected through specially prepared schedules and questionnaires by direct interview and survey method for in-depth study.

I.8.2. Sampling Design:

(a) Selection of Districts:

Out of the total 70 districts falling in the state of Uttar Pradesh 19 districts were categorized as NFSM-Pulses district and the remaining 51 districts as Non-NFSM districts. One district from NFSM-Pulses namely Lalitpur having maximum area under pulses was undertaken purposively. To study the impact of National Food Security Mission on pulses production one district namely Allahabad from Non-NFSM group of districts was undertaken on the same criteria.

(b) Selection of Blocks:

Two blocks, one each from the district thus, undertaken were chosen on the same criteria. Such Blocks were namely Jhakhora from Lalitpur (NFSM-district) and Shankargarh from Allahabad (Non-NFSM – district).

(c) Selection of Villages:

Two villages, one each from the block thus, chosen were selected on the same criteria. These villages were namely Sirsi from Jhakhora block of Lalitpur district and Garhialonipal from Shankargarh block of Allahabad district.

(d) Selection of Ultimate Samples (Pulses Growers):

From the two villages thus, chosen separate lists of pulses growers were obtained. These lists were further categorized into 4 size-groups i.e. (1) Marginal farmers (upto 1 ha), (2) Small farmers (1 – 2 ha), (3) Medium farmers (2 – 4 ha) and (4) Large farmers (above 4 ha). From these lists farmers of NFSM group and Non-NFSM group were chosen according to probability proportion to total number in each size-group restricting the number of samples to 50 in each of both the groups making 100 samples in total for in depth study. The sampling design is given in Table-1.3.

**Table-I-3
Sampling Design**

Sl. No.	Village/District/ Group	Sample Pulses Growers				
		Marginal	Small	Medium	Large	Total
1	Sirsi / Lalitpur (NFSM)					
	(a) Population	24	81	58	--	163
	(b) Samples	8	27	15	--	50
2	Garhialonipal / Allahabad (Non-NFSM)					
	(a) Population	30	30	120	4	184
	(b) Samples	6	6	37	1	50
	Total samples	14	33	52	1	100

I.8.3. Collection of Data:

(a) Collection of Primary Data:

Primary data from the samples were collected by survey method through the specific schedules and questionnaires interviewing them directly. Information on all the aspects of pulses as well as other crops cultivation were collected. Problems and suggestions of farmers were also collected. Personal observation were done during the survey.

(a) Collection of Secondary Data:

Secondary data required were collected from all the records available at state (Dte. of Agri.), District, Blocks, Villages and other levels.

1.8.4 Reference Period:

The reference period for this study was agricultural years from 2006-07 to 2008-09.

1.9 Chapter Scheme of the Study:

1. Chapter – I Introduction
2. Chapter – II Pulses Sector in the State and the Districts
3. Chapter – III Demographic Profile and Cropping Pattern of the Study Region
4. Chapter – IV Economics of Pulses Cultivation
5. Chapter – V Technology, Adoption, Marketing and other Issues
6. Chapter – VI Farmers Perceptions
7. Chapter – VII Impacts of NFSM – Pulses on Pulses Production
8. Chapter – VIII Summaries, Conclusion and Policy Implications

CHAPTER -II

PULSES SECTOR IN THE STATE AND THE DISTRICTS

This chapter mainly deals with the average area under important crops for the last five years i.e. 2004-05 to 2008-09 in the state of Uttar Pradesh, the compound Annual Growth Rates with respects to Area, Production and Productivity of important crops in the state of Uttar Pradesh for the period from 1996-97 to 2007-08, growth of important variables in the state i.e. NSA, GCA, NIA, GIA, NIA/NSA, GIA/GCA, Fertilizer consumption and Fertilizer consumption per hect. in the span of same period between 1996-97 to 2007-08, average area under important pulses in the state of Uttar Pradesh for the years from 2004-05 to 2008-09, area, production and yield and irrigated area under pulses such as Urd, Moong, Masoor, Gram and Pea CAGR of A,P,Y of all major pulses i.e. Urd, Moong, Arhar, Gram, Pea and Masoor over the years from 1996-97 to 2007-08 for main districts which are discussed in the following paragraphs:

2.1 Area Under Important Crops:

Table-II-1 indicates that on an overall average area under the important crops in the state of Uttar Pradesh was estimated to 399.45 lakh hectares during the years between 2004-05 to 2008-09 which in terms of percentage was accounted to 26.20 per cent of the GCA (Gross Cropped Area) of the whole state. The crop-wise distribution of area shows that the maximum i.e. 78.69 per cent area of the gross cropped area was covered by the foodgrain crops only of which 28.17 per cent was covered under rice, 37.12 per cent under wheat and 9.85 per cent area was covered by pulses in the state. The coverage under sugarcane was estimated to 8.36 per cent. While the area under cotton was negligibly reported to 0.02 per cent only. Thus, it is obviously clarified that in this state the foodgrain crops are given much importance and among foodgrains wheat as well as rice have been given important places in the gross cropped area. Pulses have also covered considerably at the rate of above 10 per cent of the gross cropped area. The related data are given in table-II-1.

Table-II-1

Average area under Important crops in the state of U.P. for the years from 2004-05 to 2008-09

(Area in hectares)		
Crops	Area under the crops (ha.)	% of area to GCA
Rice	5887697.60	28.17
Wheat	9429390.60	37.12
Sugarcane	2125509.80	8.36
Cotton	4400.80	0.02
Pulses	2503275.20	9.85
Foodgrains	19994889.00	78.69
Total	39945163.00	26.20

Source: Dte. of Agriculture, U.P. Lucknow

2.2 Growth Trends of Important Crops:

2.2: Compound Annual Growth Rate (CAGR) Over 1996-97 to 2007-08 for A,P,Y of Important Crops in Uttar Pradesh

The compound annual growth rate (CAGR) over 1996-97 to 2007-08 for A,P,Y of important crops in U.P. workedout in table-II-2 shows that the annual increase in the gross cropped area was 0.19 per cent in the state of U.P., while the total production had declined at the annual rate of – 0.21 per cent and as a result of it the average yield had declined at the annual rate of – 1.09 per cent in this state. Thus, it is safely concluded that the minor increase in gross cropped area of the state of U.P. had not affected the decline in total production as well as yield in this state during 1996-97 to 2007-08. The crop-wise analysis shows that the highest annual decline rate i.e. – 7.10 per cent was estimated in the area of cotton against the lowest annual decline rate i.e. – 1.55 per cent in the area of Maize. The decline rate in the area of Oilseeds and Pulses was – 1.91 per cent and – 1.67 per cent respectively in this state. While the area under Sugarcane had increased at the highest annual rate of 0.58 per cent against the lowest rate of 0.02 per cent in the area of Bajra. The increase in the area of Rice and Wheat was estimated at the rate of 0.39 per

cent and 0.49 per cent respectively. Thus, the area under cotton, oilseeds, pulses and maize had declined and the area under sugarcane, rice, wheat and bajra had increased in U.P. As regards the production and yield of important crops in this state it was found that the decline in few crops had dominated the increase in few crops and as such the production and yield had declined in the state during the span of 1996-97 to 2007-08. The related data given in table-II-2.

Table-II-2

Compound Annual Growth Rate (CAGR) over 1996-97 to 2007-08 for A,P,Y of Important Crops in the State of Uttar Pradesh

(In %)

Important crops in Uttar Pradesh	CAGR for Area	CAGR for Production	CAGR for Yield
Rice	0.39	0.55	0.15
Wheat	0.49	2.19	1.68
Sugarcane	0.58	– 0.79	1.38
Cotton	– 7.10	NA	8.01
Pulses	– 1.67	– 0.90	7.05
Oilseeds	– 1.91	– 1.63	0.26
Bazra	0.02	0.99	0.97
Maize	– 1.55	– 2.4	– 0.19
All Crops	0.19	– 0.21	– 1.09

2.3 Growth of Important Variables i.e. NSA, GCA, NIA, GIA and Fertilizer Consumption in the State of Uttar Pradesh

The estimates relating to NSA, GCA, NIA, GIA, NIA/NSA, GIA/GCA, fertilizer consumption and fertilizer consumption per hectare and growth in the same span of period between 1996-97 and 2007-08 in U.P. analyzed in table-II-3 reveals that in the state of Uttar Pradesh the net sown area (NSA) has declined considerably from 175.13 lakh hectares in the year 1996-97 to 164.17 lakh hectares in the year 2006-07 which marginally increased to 165.62 lakh hectares till the year 2007-08. Thus, the annual decline in the net sown area was estimated at the rate of – 0.51 per

cent during the span of 1996-97 to 2007-08 in the state of Uttar Pradesh. Similarly the Gross Cropped Area (GCA) in the state of Uttar Pradesh has also declined from 263.77 lakh hectares in the year 1998-99 to 254.71 lakh hectares till the year 2007-08 with ups and downs in different years being lowest i.e. 243.11 lakh hectares in year 2001-02. Thus, the annual decline in the gross cropped area (GCA) too was estimated at the rate of – 0.20 per cent during the same span of period from 1996-97 to 2007-08 in this state.

As regards the net irrigated area (NIA) in the state of U.P. it was estimated and found that it increased from 120.12 lakh hectares in the year 1996-97 to 134.35 lakh hectares till the year 2007-08 in the whole state. Thus, the annual increase in the net irrigated area in the state was estimated at the rate of 1.03 per cent during the same span of period. Accordingly the Gross Irrigated Area (GIA) in the state as a whole was found to be increased from 173.22 lakh hectares in the year 1996-97 to 196.12 lakh hectares till the year 2007-08. Thus, the annual increase in the gross irrigated area was estimated at the rate of 1.13 per cent during 1996-97 to 2007-08.

While the increase in the share of NIA in the NSA of the state of U.P. was found to be increased from 6.9 per cent in the year 1996-97 to 8.1 per cent till the year 2007-08 with an annual growth at the rate of 1.47 per cent in the same span of period. But the increase in the share of gross irrigated area (GIA) in the gross cropped area (GCA) was found to be increased from 6.6 per cent in the year 1996-97 to 7.7 per cent till the year 2007-08 with an annual growth at the rate of 1.42 per cent during the span of 1996-97 to 2007-08.

Regarding fertilizer consumption it was estimated that the total fertilizer consumption in the state of U.P. increased from 30.30 M.T. in the year 1996-97 to 39.73 M.T. till the year 2007-08. Thus, the annual increase in the fertilizer consumption was estimated at the rate of 2.49 per cent during the span of same period. The per hectare fertilizer consumption in the state of Uttar Pradesh has increased from 116.36 kgs in the year 1996-97 to 156.91 kgs till the year 2007-08. Thus, the annual increase in the per hectare fertilizer consumption was estimated at the rate of 2.76 per cent during the same span of period. The related data are given in table-III-3.

Table-II-3**Growth of Important Variables in the State During 1996-97 to 2007-08**

YEAR	NSA in Lakh hect.	GCA in Lakh hect.	NIA in Lakh hect.	GIA in Lakh hect.	NIA/NSA	GIA/GCA	FERTCO NS in M.T.	FERTCON S PER HA in Kgs
1996-97	175.13	260.45	120.12	173.22	0.69	0.66	30.30	116.36
1997-98	175.85	261.62	126.91	176.98	0.72	0.68	30.92	118.16
1998-99	176.03	263.77	128.12	181.26	0.73	0.69	32.76	124.20
1999-00	168.25	253.04	124.01	176.90	0.74	0.70	29.61	117.05
2000-01	168.12	254.47	128.28	182.20	0.76	0.72	32.60	128.09
2001-02	165.97	243.11	128.48	177.92	0.77	0.73	32.44	133.45
2002-03	167.50	254.25	132.27	185.24	0.79	0.73	32.95	129.60
2003-04	166.83	255.24	131.19	189.39	0.79	0.74	33.10	129.69
2004-05	166.33	253.07	130.75	189.70	0.79	0.75	34.64	136.89
2005-06	165.73	254.15	133.13	192.18	0.80	0.76	37.35	146.94
2006-07	164.17	253.20	130.85	191.42	0.80	0.76	37.56	148.34
2007-08	165.62	254.71	134.35	196.12	0.81	0.77	39.73	156.91
CAGR	- 0.51	- 0.20	1.03	1.13	1.47	1.42	2.49	2.76

Source: Directorate of Agriculture, U.P., Krishi Bhawan, Lucknow, Uttar Pradesh

2.4 Area Under Pulses in Uttar Pradesh

The average area under important pulses in the state of Uttar Pradesh during the span of 2004-05 to 2008-09 workedout in Table-II-4 shows that the total area under important pulses was estimated to 25.03 lakh hectares of which the maximum i.e. 6.39 lakh hectares or 25.54 per cent was accounted under Gram. The next important pulse crop in the state was lentil (Masoor) which accounted to 22.92 per cent of the total area under pulses. The minimum i.e. 2.69 per cent area was reported under Moong in the state of U.P. While the area under Urd, Arhar and Pea was estimated to 18.82 per cent, 15.05 per cent and 14.96 per cent respectively in the whole state of U.P. Thus, Gram and Lentil (Masoor) were found to cover about half of the total area under pulses in this state. Urd, arhar as well as Pea were also found to cover considerable area of the total coverage under pulses. The related data are contained in table-II-4.

Table-II-4**Average area under Important pulses in the state of U.P. during 2004-05 to 2008-09**

(Area in hectares)

Crops	Area under the Pulses	% of area to total pulses area
Urd	46751.70	18.82
Moong	67017.20	2.69
Arhar	376069.20	15.05
Gram	638705.60	25.54
Pea	378522.40	14.96
Masoor	575443.80	22.92
Total	2503275.20	100.00

Source: Dte. of Agriculture, U.P. Lucknow

2.5 Area, Production and Yield of Pulses in the State of Uttar Pradesh**2.5(a) Area, Production, Yield and Irrigated Area under Urd in the State of Uttar Pradesh During 1996-97 to 2007-08**

The area, production, yield and irrigated area under Urd in the whole state of U.P. during 1996-97 to 2007-08 analyzed in table-II-5(a) shows that the total area under Urd decreased from 3.86 lakh hectares in the year 1996-97 to 3.31 lakh hectares till the year 1998-99. But thereafter it increased gradually to 6.24 lakh hectares till the year 2002-03 and again it decreased continuously to 4.46 lakh hectares till the year 2007-08 with a sudden increase in the year 2006-07 with an annual growth at the rate of 1.33 per cent during the span of 1996-97 to 2007-08. Thus, the growth in the area of urd was marginal in zig-zag manner in the state of U.P.

While the production of urd in the state of U.P. increased from 1.64 lakh M.T. in the year 1996-97 to 2.49 lakh M.T. till the year 2007-08 with an annual growth at the rate of 3.87 per cent during the years from 1996-97 to 2007-08. This clarifies well that growth in production of urd in the state of U.P. was considerable.

Regarding yield of urd in the state of U.P. it was found that the yield of urd varied between the minimum i.e. 2.60 quintals per hectare in the year 2002-03 to the maximum i.e. 5.69 quintals per hectare in the year 2005-06. The average annual rate of growth in the yield during the span of 1996-97 to 2007-08 was estimated as 2.51 per cent only in the state. Thus, the yield of urd was discouraging and more or less stagnated in the state of Uttar Pradesh. The irrigated area under urd was decreased from 0.74 lakh hectare in the year 1996-97 to 0.59 lakh hectare till the year 2007-08 with an annual decrease at the rate of – 2.05 per cent during the same span of period. Thus, the irrigated area of urd in the state as whole has decreased gradually with minor ups and downs during the years from 1996-97 to 2007-08. The concerned data are given in table-II-5(a).

Table-II-5(a)

**Area, Production, Yield and Irrigated area under Urd in the State of U.P.
(During 1996-97 to 2007-08)**

(Area in Ha., Production in M.T. Yield in Qtl./Ha.)

Years	Area	Production	Yield	Irrigated Area
1996-97	385776	163960	4.25	74247
1997-98	346844	106049	3.06	70975
1998-99	330583	142220	4.30	70454
1999-00	385162	162959	4.23	66644
2000-01	423403	177756	4.20	68353
2001-02	459357	190665	4.15	68205
2002-03	624270	162318	2.60	65963
2003-04	521958	202523	3.88	59901
2004-05	410908	191029	4.65	57770
2005-06	397655	226309	5.69	62215
2006-07	561073	248553	4.43	63229
2007-08	445991	249056	5.58	59103
CAGR	1.33	3.87	2.51	– 2.05

Source: Directorate of Agriculture, U.P., Krishi Bhawan, Lucknow, Uttar Pradesh.

2.5(b) Area, Production, Yield and Irrigated Area under Moong in the State of Uttar Pradesh During 1996-97 to 2007-08

The area, production, yield and irrigated area under Moong in the state of U.P. during the span of 1996-97 to 2007-08 workedout in table-II-5(b) indicates that the area under Moong decreased from 1.16 lakh hectares in the year 1996-97 to 0.61 lakh hectares till the year 2007-08 continuously with the annual decrease at the rate of – 5.60 per cent during the span of 1996-97 to 2007-08 in the state. Thus, it is very well clear that in the state as a whole there was tremendous decrease in the area of Moong during 1996-97 to 2007-08. Accordingly the production of Moong in this state had also decreased from 0.45 lakh M.T. in the year 1996-97 to 0.34 lakh M.T. till the year 2007-08 with downs and ups being lowest i.e. 0.26 lakh M.T. in the years 2001 to 2003 with an annual decrease at the rate of – 2.53 per cent in the same span of period. Thus, production of Moong was also much discouraging in the state of U.P. in the years from 1996-97 to 2007-08. While the yield of Moong in this state increased from 3.90 quintals per hectare in the year 1996-97 to 5.55 quintals per hectare till the year 2007-08 with ups and downs. The annual increase in the yield of Moong in the state was estimated at the rate of 3.25 per cent during the years from 1996-97 to 2007-08. Thus, the growth in the yield of Moong was satisfactory beyond the discouraging performance of area as well as production of Moong in this state. The decrease in the irrigated area of moong was estimated from 0.87 lakh hectares till the year 2007-08 with an annual decrease at the rate of – 8.56 per cent during the years 1996-97 to 2007-08. Thus, it is obviously clear that irrigated area under moong had decreased continuously with a faster pace in the same span of period in the state of U.P. The related data are given in table-II-5(b).

Table-II-5(b)
Area, Production, Yield and Irrigated area under Moong in the State of U.P.
(During 1996-97 to 2007-08)

(Area in Ha., Production in M.T. Yield in Qtl./Ha.)

Years	Area	Production	Yield	Irrigated Area
1996-97	115598	45100	3.90	86781
1997-98	107779	47413	4.40	81902
1998-99	97684	45891	4.70	71351
1999-00	81552	32601	4.00	53800
2000-01	72018	29854	4.15	45096
2001-02	56651	26223	4.63	35733
2002-03	69297	26356	3.80	35706
2003-04	70430	32100	4.56	34410
2004-05	62705	33145	5.29	34810
2005-06	66704	31893	4.78	35828
2006-07	73952	30855	4.17	35672
2007-08	61295	34029	5.55	32468
CAGR	– 5.60	– 2.53	3.25	– 8.56

Source: Directorate of Agriculture, U.P., Krishi Bhawan, Lucknow, Uttar Pradesh.

2.5(c) Area, Production, Yield and Irrigated Area under Arhar in the State of Uttar Pradesh During 1996-97 to 2007-08

The area, production, yield and irrigated area under Arhar in the state of U.P. analyzed in table-II-5(c) indicates that the area under Arhar decreased from 4.64 lakh hectares in the year 1996-97 to 3.26 lakh hectares till the year 2007-08 with an annual decrease at the rate of – 3.16 per cent during the span of 1996-97 to 2007-08. Thus, the decrease in the area under Arhar was obviously considerable in the state of U.P. during the same span of period. Accordingly the production of Arhar firstly increased from 4.80 lakh M.T. in the year 1996-97 to 5.44 lakh hectare till the 1998-99. But thereafter, it decreased continuously to 2.98 lakh hectares till the year 2007-08 with an annual decrease at the rate of – 4.23 per cent in the state during the years from 1996-97 to

2007-08. Therefore, it is obviously clear that production of Arhar in the state of U.P. decreased tremendously after 1998-99. Similarly the yield of Arhar in this state previously increased from 10.34 Qtls. per Ha in the year 1996-97 to 12.81 Qtls. per Ha till the year 1998-99. But thereafter, it decreased to 9.15 Qtls. per Ha till the year 2007-08 being lowest i.e. 7.36 Qtls. per Ha in 2005-06 with an annual decrease at the rate of – 1.10 per cent during the same span of period. Thus, the yield of Arhar also decreased considerably in this state during the same period. While the irrigated area under Arhar decreased continuously from 0.60 lakh hectares in the year 1996-97 to 0.47 lakh hectares till the year 2007-08 with ups and downs in the state of U.P. during 1996-97 to 2007-08. Thus, it is safely concluded that the area, production, yield as well as irrigated area under Arhar decreased discouragingly in the state of U.P. during 1996-97 to 2007-08. The related data are given in table-II-5(c).

Table-II-5(c)

**Area, Production, Yield and Irrigated area under Arhar in the State of U.P.
(During 1996-97 to 2007-08)**

(Area in Ha., Production in M.T. Yield in Qtl./Ha.)

Years	Area	Production	Yield	Irrigated Area
1996-97	463759	479505	10.34	59788
1997-98	425278	496264	11.67	52126
1998-99	424717	544028	12.81	48437
1999-00	406596	509756	12.54	52861
2000-01	394228	456228	11.57	53597
2001-02	357901	341792	9.55	54125
2002-03	360467	395677	10.98	51556
2003-04	407520	392032	9.62	58911
2004-05	390598	387482	9.92	52715
2005-06	386732	284585	7.36	48404
2006-07	369884	325099	8.79	46861
2007-08	325612	297958	9.15	46518
CAGR	– 3.16	– 4.23	– 1.10	– 2.26

Source: Directorate of Agriculture, U.P., Krishi Bhawan, Lucknow, Uttar Pradesh.

2.5(d) Area, Production, Yield and Irrigated Area under Lentil (Masoor) in the State of Uttar Pradesh During 1996-97 to 2007-08

The data pertaining to area, production, yield and irrigated area under Lentil (Masoor) in U.P. during 1996-97 to 2007-08 worked out in table-II-5(d) indicates that the area under Lentil firstly increased from 4.89 lakh hectares in the year 1996-97 to 6.52 lakh hectares till the year 1999-2000 in this state. But thereafter it again decreased to 5.20 lakh hectares estimating lowest i.e. 4.65 lakh hectares in 2006-07 with an annual decrease at the rate of – 2.06 per cent during the same span of period in this state. Thus, there was a considerable decrease in the area of Lentil in the state as a whole during 1996-97 to 2007-08. The production of Lentil increased from 3.53 lakh M.T. in the year 1996-97 to 5.35 lakh M.T. till 2003-04 with ups and downs at an annual rate of – 1.76 per cent decrease in this state during the same span of period. Thus, production of Lentil also decreased marginally in the state during the same span of period. While the yield of Lentil increased from 7.23 quintal per hectare in the year 1996-97 to 8.82 quintal per hectare till the year 2007-08 with ups and downs at an annual marginal increase of 0.31 per cent in this state during 1996-97 to 2007-08. Thus, the yield of Lentil increased marginally in the state during the same span of period. But the irrigated area under Lentil increased from 0.43 lakh hectares in the year 1996-97 to 0.59 lakh hectares till the year 2007-08 with ups and downs estimating highest i.e. 0.81 lakh hectares in 1999-2000 at an annual rate of 1.54 per cent during 1996-97 to 2007-08 in this state. Thus, the irrigated area under Lentil increased considerably in this state during 1996-97 to 2007-08. The related data are given in table-II-5(d).

Table-II-5(d)

**Area, Production, Yield and Irrigated area under Lentil (Masoor) in the State of U.P.
(During 1996-97 to 2007-08)**

(Area in Ha., Production in M.T. Yield in Qtl./Ha.)

Years	Area	Production	Yield	Irrigated Area
1996-97	488585	353241	7.23	43018
1997-98	528851	383960	7.26	53166
1998-99	587044	480415	8.18	58865
1999-00	651730	408052	6.26	81176
2000-01	625265	499774	7.99	79417
2001-02	570537	435467	7.63	63674
2002-03	571992	515023	9.00	61832
2003-04	649025	534775	8.24	75538
2004-05	651254	459477	7.06	78551
2005-06	591163	419824	7.10	77417
2006-07	465349	354471	7.62	56263
2007-08	520428	459264	8.82	59195
CAGR	– 2.06	– 1.76	0.31	1.54

Source: Directorate of Agriculture, U.P., Krishi Bhawan, Lucknow, Uttar Pradesh.

2.5(e) Area, Production, Yield and Irrigated Area under Gram in the State of Uttar Pradesh During 1996-97 to 2007-08

The area under Gram in the state of U.P. decreased from 8.85 lakh hectares in the year 1997-98 to 6.29 lakh hectares till the year 2007-08 estimating lowest i.e. 5.56 lakh hectares in 2006-07 with an annual decrease at the rate of – 0.57 per cent in this state during 1996-97 to 2007-08. Thus, the area under Gram decreased marginally in the state of U.P. during 1996-97 to 2007-08. While the production of Gram in this state firstly increased from 7.45 lakh M.T. in the year 1996-97 to 8.17 lakh M.T. till the year 2000-01. But thereafter it decreased to 4.06 lakh M.T. till 2006-07 which again increased to 6.38 lakh M.T. in the year 2007-08 with an annual decrease at

the rate of – 2.41 per cent in this state during 1996-97 to 2007-08. Thus, the production of Gram decreased considerably in this state during the span of 1996-97 to 2007-08. While the yield of Gram increased from 8.47 quintal per hectare in the year 1996-97 to 10.14 quintal per hectare till the year 2007-08 estimating slightly higher i.e. 10.37 quintal per hectare in 2002-03. Thus, yield of Gram increased considerably in the state during 1996-97 to 2007-08. On the other hand the irrigated area under Gram increased from 1.30 lakh hectares in the year 1996-97 to 1.53 lakh hectares firstly till the year 2001-02. But thereafter, it decreased to 1.04 lakh hectares till 2007-08 estimating as lowest as 0.85 lakh hectares in the year 2006-07 with an annual increase at the rate of 2.95 per cent during span of the same period. Thus, the irrigated area under Gram increased considerably in this state during 1996-97 to 2007-08. The related data are given in the table-II-5(e).

Table-II-5(e)

**Area, Production, Yield and Irrigated area under Gram in the State of U.P.
(During 1996-97 to 2007-08)**

(Area in Ha., Production in M.T. Yield in Qtl./Ha.)

Years	Area	Production	Yield	Irrigated Area
1996-97	880529	745409	8.47	130362
1997-98	885284	771892	8.72	130875
1998-99	820923	777896	9.48	118254
1999-00	833007	702718	8.44	120586
2000-01	840602	816795	9.72	143980
2001-02	854334	765100	8.96	152678
2002-03	771691	800270	10.37	138202
2003-04	692987	634701	9.16	109173
2004-05	662245	594198	8.97	95138
2005-06	654708	486973	7.44	100344
2006-07	554653	405845	7.32	81525
2007-08	628935	637752	10.14	104479
CAGR	– 0.57	– 2.41	1.82	2.95

Source: Directorate of Agriculture, U.P., Krishi Bhawan, Lucknow, Uttar Pradesh.

2.5(f) Area, Production, Yield and Irrigated Area under Pea in the State of Uttar Pradesh
During 1996-97 to 2007-08

The area under Pea in the whole state of U.P. decreased from 4.90 lakh hectares in the year 1997-98 to 3.38 lakh hectares till the year 2007-08 estimating lowest i.e. 2.45 lakh hectares in 2006-07 with an annual decrease at the rate of – 3.02 per cent during the span of 1996-97 to 2007-08 in this state. Thus, there was a tremendous decrease in the area under Pea during the same span of period in this state. While the production of Pea was estimated highest i.e. 6.43 lakh hectares in the year 2003-04 against the lowest i.e. 2.62 lakh hectares in the year 2006-07 with much varying ups and downs and a considerable annual decrease at the rate of – 1.41 per cent during the years from 1996-97 to 2007-08. Thus, the decrease in the production of Pea was also considerable in the state of U.P. during the same span of period. But in spite of decrease in the area and production of Pea the yield increased from 9.80 quintals per hectare in 2005-06 to 13.84 quintal per hectare in 1998-99 with ups and downs and an annual increase at the rate of 1.65 per cent during the span of 1996-97 to 2007-08. Thus, in spite of reduction in area as well as production the yield of Pea was found to be increased at a considerable rate during the years 1996-97 to 2007-08. The irrigated area under Pea also decreased from 3.69 lakh hectares in the year 2003-04 to 1.91 lakh hectares in 2006-07 with ups and downs and an annual decrease at the rate of – 1.99 per cent during the span of 1996-97 to 2007-08 in the state of U.P. Thus, the irrigated area under Pea also decreased considerably in the state of U.P. during the years from 1996-97 to 2007-08. The related data are given in table-II-5(f).

Table-II-5(f)

**Area, Production, Yield and Irrigated area under Pea in the State of U.P.
(During 1996-97 to 2007-08)**

(Area in Ha., Production in M.T. Yield in Qtl./Ha.)

Years	Area	Production	Yield	Irrigated Area
1996-97	425007	494378	11.63	236813
1997-98	489743	502108	10.25	342458
1998-99	405066	560444	13.84	298569
1999-00	333480	344224	10.32	238270
2000-01	327556	395889	12.09	244045
2001-02	344323	423051	12.29	258678
2002-03	399208	547690	13.72	308111
2003-04	475115	634212	13.35	369442
2004-05	462679	540067	11.67	367910
2005-06	371656	364283	9.80	303681
2006-07	245100	261855	10.68	191319
2007-08	338062	406777	12.03	280206
CAGR	– 3.02	– 1.41	1.65	– 1.99

Source: Directorate of Agriculture, U.P., Krishi Bhawan, Lucknow, Uttar Pradesh.

2.6 CAGR Over 1996-97 to 2007-08 for A.P.Y of Important Pulses in Main District of Uttar Pradesh

2.6(I):- CAGR Over 1996-97 to 2007-08 for A.P.Y of Urd in Main Districts of U. P.

The analysis workedout in table-II-6(I) indicates that in the main pulses growing districts of U.P. the compound annual growth rate over 1996-97 to 2007-08 for the area under Urd was estimated to be increased at the rate of 1.69 per cent on the overall in the state. The district-wise analysis shows that the area under Urd increased with a faster rate of 12.59 per cent in Mahoba district followed by 10.09 per cent in Lalitpur District. In other districts such as Jhansi, Banda and Chitrakoot the rate of increase varied between 0.65 to 4.54 per cent only. While the decrease in

the area of Urd was faster i.e. – 11.49 per cent in Hamirpur District, – 2.25 per cent in Allahabad and – 1.38 per cent in Fatehpur District respectively. Thus, the faster increase under the area of urd in Mahoba and Lalitpur dominated the decrease in the area of urd in Hamirpur, Allahabad and Fatehpur Districts and converted the area under urd to be increased considerable in the state of U.P. Accordingly the increase in production of urd which was faster in Chitrakoot, Mahoba and Lalitpur at the rate of 19.25 per cent, 14.52 per cent and 10.75 per cent respectively dominated the decrease in the production of urd in Hamirpur, Allahabad and Fatehpur by – 12.69 per cent, – 1.99 per cent and – 0.32 per cent respectively making an overall increase at the rate of 4.78 per cent in the state of U.P. Thus, the overall increase in the production of urd in this state was faster at the rate of 4.78 per cent during the span of 1996-97 – 2007-08. As a result of the faster increase in the production as well as area of urd the yield of urd also increased in the state as a whole at a considerable rate of 1.46 per cent. Among the districts the increase in the yield of urd was found fastest i.e. at the rate of 14.08 per cent against the lowest at the rate of 0.24 per cent in Allahabad District. While the decrease in the yield of urd was faster i.e. – 5.61 per cent in Banda and – 1.37 per cent in Hamirpur District. Thus, the yield of Urd also increased with a considerable rate of 1.46 per cent in the state of U.P. during 1996-97 to 2007-08. The related data are given in table-II-6(I).

Table-II-6(I)

CAGR Over 1996-97 to 2007-08 for A,P,Y of Urd in Main Districts of Uttar Pradesh

(Figures in %)

Sl. No.	MAIN DISTRICTS	AREA	PRODUCTION	YIELD
1	Fathepur	– 1.38	– 0.32	1.07
2	Allahabad	– 2.25	– 1.99	0.24
3	Lalitpur	10.09	10.75	0.61
4	Jhansi	1.73	2.47	0.73
5	Mahoba	12.59	14.52	1.71
6	Hamirpur	– 11.49	– 12.69	– 1.37
7	Jalaun	--	--	--
8	Banda	0.65	6.23	– 5.61
9	Chitrkoot	4.54	19.25	14.08
	Total	1.69	4.78	1.46

2.6(II):- CAGR Over 1996-97 to 2007-08 for A.P.Y of Moong in Main Districts of U. P.

The CAGR for the A.P.Y under Moong in main districts of U.P. over 1996-97 to 2007-08 analyzed in 2.6(II) shows that the area under Moong increased marginally at the rate of 0.90 per cent in the state as a whole. While among the main districts it was found highest i.e. 6.98 per cent in Chitrakoot district against the lowest i.e. 0.11 per cent in Lalitpur. The decrease rate in the area of Moong was found highest i.e. – 5.47 per cent in Hamirpur against lowest i.e. – 1.69 in Allahabad district. The increase rate of area in Fathepur and Mahoba was also considerable. Thus, the increase in few districts was balanced by decrease in few districts and as such resulted the increase in area of Moong to be marginal in this state as a whole. Accordingly the production of Moong was also found to be increased marginally at the rate of 0.75 per cent in the state as a whole. The position of districts in case of production was quite similar as it was in case of area of Moong. Thus, production of Moong also increased marginally in the state as a whole. As regards the yield of Moong the rate of increase was also found marginal i.e. 0.35 per cent in the state as a whole. The position among the districts was quite different as the highest rate of decrease in yield i.e. – 5.82 per cent was estimated in Hamirpur district and the highest rate of increase in yield of Moong i.e. 2.19 per cent was estimated in Banda district. Thus, the increase in the yield of Moong was also found to be quite negligible in the state of U.P. during 1996-97 to 2007-08. The related data are contained in table-II-6(II).

Table-II-6(II)

CAGR Over 1996-97 to 2007-08 for A,P,Y of Moong in Main Districts of Uttar Pradesh
(Figures in %)

Sl. No.	MAIN DISTRICTS	AREA	PRODUCTION	YIELD
1	Fathepur	5.32	7.54	2.09
2	Allahabad	– 1.69	– 2.53	– 0.85
3	Lalitpur	0.11	0.95	0.85
4	Jhansi	– 4.79	– 3.23	1.67
5	Mahoba	4.47	5.74	1.22
6	Hamirpur	– 5.47	– 10.97	– 5.82
7	Jalaun	--	--	--
8	Banda	2.22	– 0.03	2.19
9	Chitrkoot	6.98	8.56	1.46
	Total	0.90	0.75	0.35

2.6(III):- CAGR Over 1996-97 to 2007-08 for A.P.Y of Arhar in Main Districts of U. P.

The CAGR over 1996-97 to 2007-08 for A.P.Y. of Arhar in main districts of U.P. worked-out in table-II-6(III) shows that the area under Arhar in the state as a whole decreased tremendously at the annual rate of – 3.85 per cent during 1996-97 to 2007-08. Among the main districts it was found that except Chitrakoot district wherein it has increased at the rate of 1.64 per cent it has decreased in all the districts estimating highest i.e. – 12.89 per cent in Jhansi district against the lowest i.e. – 0.28 per cent in Fathepur district. The decrease at the rate of – 8.28 per cent in Lalitpur district was considerable. Thus, the decrease in the area under Arhar was tremendous in the state as a whole during the span of same period. Accordingly the production of Arhar in this state also decreased tremendously at the rate of – 7.92 per cent. The position in various main districts was similar as it was in case of area under Arhar. The decrease in the yield of Arhar in the state as a whole was also very much discouraging as estimated at the rate of – 4.85 per cent. Among districts it has decreased in all the main districts excepting Lalitpur district where it has increased at the rate of 1.78 per cent. Thus, the yield of Arhar too has decreased tremendously in this state during 1996-97 to 2007-08. The related data are given table-II-6(III).

Table-II-6(III)

CAGR Over 1996-97 to 2007-08 for A,P,Y of Arhar in Main Districts of Uttar Pradesh

(Figures in %)

Sl. No.	MAIN DISTRICTS	AREA	PRODUCTION	YIELD
1	Fathepur	– 0.28	– 7.32	– 7.06
2	Allahabad	– 0.47	– 4.16	– 3.71
3	Lalitpur	– 8.28	– 6.65	1.78
4	Jhansi	– 12.89	– 18.01	– 5.87
5	Mahoba	– 1.77	– 6.72	– 5.04
6	Hamirpur	– 2.71	– 8.38	– 5.82
7	Jalaun	--	--	--
8	Banda	– 4.37	– 9.29	– 5.14
9	Chitrkoot	1.64	– 2.87	– 4.43
	Total	– 3.85	– 7.92	– 4.85

2.6(IV):- CAGR Over 1996-97 to 2007-08 for A.P.Y of Gram in Main Districts of U. P.

The CAGR over 1996-97 to 2007-08 for A.P.Y. of Gram in main districts of U.P. analyzed in table-II-6(IV) shows that the area under Gram in this state also decreased tremendously at the rate of – 3.34 percent. Among districts it decreased more or less in all districts except in Chitrakoot where it increased marginally at the rate of 1.59 per cent only. The production also decreased at the rate of – 0.05 per cent in this state. Among districts the production was balanced with increase in few and decrease in few resulting decrease on an overall estimating highest at 9.06 per cent decrease in Allahabad and highest increase i.e. 18.12 per cent Banda. Thus, production of Gram also decreased marginally in this state during the same span of period. While the yield of Gram increased marginally at the rate of 0.53 per cent in state as a whole. Among the main districts it was balanced as in case of area and production of it resulting the marginal increase. Thus, the yield of Gram increased negligibly in the state of U.P. during the span of 1996-97 to 2007-08. The related data are given in table-II-6(IV).

Table-II-6(IV)

CAGR Over 1996-97 to 2007-08 for A,P,Y of Gram in Main Districts of Uttar Pradesh

(Figures in %)

Sl. No.	MAIN DISTRICTS	AREA	PRODUCTION	YIELD
1	Fathepur	– 0.57	0.29	0.86
2	Allahabad	– 9.86	– 9.06	0.77
3	Lalitpur	– 5.88	– 7.31	– 1.51
4	Jhansi	– 7.11	– 5.09	– 2.18
5	Mahoba	– 0.94	1.43	2.39
6	Hamirpur	– 0.27	– 0.46	– 0.17
7	Jalaun	--	--	--
8	Banda	– 3.68	18.12	1.27
9	Chitrkoot	1.59	2.47	0.86
	Total	– 3.34	– 0.05	0.53

2.6(V):- CAGR Over 1996-97 to 2007-08 for A.P.Y of Pea in Main Districts of U. P.

Table-II-6(V) indicates that the area under Pea in the state of U.P. increased at the rate of 2.35 per cent on an overall. Among the main districts it increased at the rate of 11.40 per cent, 10.93 per cent and 8.94 per cent in Chitrakoot, Lalitpur and Banda districts respectively. While it

decreased at the rate of – 5.59 per cent, – 3.59 per cent and – 2.84 per cent in Allahabad, Hamirpur and Mahoba districts respectively. Therefore, increase dominated the decrease in the area of pea. Thus, it can be concluded safely that the area under pea increased considerably in the state during 1996-97 to 2007-08. Accordingly the production of pea also increased in the state at the rate of 1.80 per cent. The district-wise analysis shows that the increase in production of pea was estimated at the rate of 13.07 per cent, 9.85 per cent and 9.35 per cent in Chitrakoot, Banda and Lalitpur district respectively. While the decrease in production of pea was estimated as –7.23 per cent, – 5.14 per cent and – 4.41 per cent in Allahabad, Mahoba and Hamirpur districts respectively. Thus, the production of pea in the state of U.P. increased considerably dominating the decrease in this state during the same span of period. While the yield of pea decreased marginally at the rate of – 0.22 per cent in this state as a whole. Among the main districts the decrease dominated the increase in the yield and resulted the decrease marginally. Thus, yield of pea was also decreased marginally in this state during the years 1996-97 to 2007-08. The related data are given in table-II-6(V).

Table-II-6(V)

CAGR Over 1996-97 to 2007-08 for A,P,Y of Pea in Main Districts of Uttar Pradesh

(Figures in %)

Sl. No.	MAIN DISTRICTS	AREA	PRODUCTION	YIELD
1	Fathepur	– 0.47	– 2.20	– 1.74
2	Allahabad	– 5.59	– 7.23	– 1.74
3	Lalitpur	10.93	9.35	1.47
4	Jhansi	0.04	1.15	1.12
5	Mahoba	– 2.84	– 5.14	– 2.37
6	Hamirpur	– 3.59	– 4.41	– 0.85
7	Jalaun	--	--	--
8	Banda	8.94	9.85	0.83
9	Chitrkoot	11.40	13.07	1.52
	Total	2.35	1.80	– 0.22

2.6(VI):- CAGR Over 1996-97 to 2007-08 for A.P.Y of Masoor in Main District of U. P.

The CAGR over 1996-97 to 2007-08 for A.P.Y. of Masoor analyzed in table-II-6(VI) shows that the area under Masoor increased in the state as a whole at the rate of 3.57 per cent. Among the main districts it increased at the rate of 18.00 per cent, 12.81 per cent and 12.04 per cent in

Chitrakoot, Mahoba and Fatehpur respectively against the decrease at the rate of – 26.11 per cent, – 2.69 per cent in Allahabad and Banda districts respectively. Thus, on the whole, increase in the area of Masoor in this state was considerable. The production of Masoor decreased marginally as the increase in few districts was dominated by decrease in few districts resulting decrease at the rate of – 0.09 per cent in this state. Accordingly the yield of Masoor also decreased at the rate of – 1.09 per cent in this state as a whole. Among the main districts the increase of yield was also dominated by decrease in few districts resulting marginal decrease in the state. Thus, production as well as yield of Masoor both decreased marginally in this state. The related data are given in table-II-6(VI).

Table-II-6(VI)

CAGR Over 1996-97 to 2007-08 for A,P,Y of Masoor in Main Districts of Uttar Pradesh

(Figures in %)

Sl. No.	MAIN DISTRICTS	AREA	PRODUCTION	YIELD
1	Fatehpur	12.04	10.43	– 1.42
2	Allahabad	– 26.16	– 27.40	– 1.42
3	Lalitpur	4.25	1.19	– 2.93
4	Jhansi	0.69	1.76	1.07
5	Mahoba	12.81	1.94	– 0.85
6	Hamirpur	– 0.34	0.11	0.45
7	Jalaun	--	--	--
8	Banda	– 2.69	– 3.78	– 1.12
9	Chitrkoot	18.00	14.96	– 2.57
	Total	3.57	– 0.09	– 1.09

CHAPTER -III

DEMOGRAPHIC PROFILE AND CROPPING PATTERN OF THE STUDY REGION

An attempt has been made in this chapter to analyze the demographic profile and cropping pattern on the sample farms of Lalitpur and Allahabad districts of Uttar Pradesh. As it has already been mentioned in the Ist chapter of this report that Lalitpur for NFSM and Allahabad for Non-NFSM districts were selected for this study. This chapter is divided into following heads:

1. Demographic Profile
2. Cropping Pattern
3. Area under Pulses
4. Irrigated Area

3.1 General Overview of Sample Farms of Lalitpur (NFSM) District

I. Demographic Profile of the Sample Farmers of Lalitpur (NFSM) district

The demographic profile of the sample farmers of Lalitpur district is presented in table-III-1 which shows that out of total population of 347 of 50 selected households, 61.67 per cent were adults and rest 38.33 per cent were children. It is also noticed from table-III-1 that male population was higher by 8.41 per cent over female population of 98. The female population was less than the male population across the size of farms. Of the total selected households of 50, the small sample farmers accounted for 54 per cent followed by 30 per cent and 16 per cent for medium and marginal sample farmers respectively. There was no large farmer in the selected 50 households.

Table-III-1
Demographic Profile in NFSM District Lalitpur

Groups	Adults			Children	Total	No. of Households
	Males	Females	Total			
Marginal	14	11	25	16	41	8
Small	53	45	98	71	169	27
Medium	49	42	91	46	137	15
Large	--	--	--	--	--	--
Total	116	98	214	133	347	50

II. Educational Profile of Heads of Households

The educational profile of the heads of households of sample farmers is indicated in table-III-2. Table-III-2 reveals that 28 per cent of the heads of households were illiterate. Among the literate heads of the households, 28 per cent were educated upto primary level, while 44 per cent heads of households had received education upto secondary and above level. It is also evident from table-III-2 that the illiterates of heads of households were maximum on small sample farms followed by medium sample farms. Against this, higher literacy was witnessed in heads of households on marginal farms.

Table-III-2
Educational Profile of the Heads in NFSM District Lalitpur

(No. of HHlds)

Groups	Illiterates	Primary	Secondary and Above	Total
Marginal	1	--	7	8
Small	9	6	12	27
Medium	4	8	3	15
Large	--	--	--	--
Total	14	14	22	50

% Distribution of Education of the Heads in NFSM District Lalitpur

(%)

Groups	Illiterates	Primary	Secondary and Above	Total
Marginal	12.50	--	87.50	100
Small	33.33	22.22	44.45	100
Medium	26.62	53.33	20.00	100
Large	--	--	--	100
Total	28.00	28.00	44.00	100

III. Educational Profile of Adult Population

The educational profile of adult population of sample farms of Lalitpur district is presented in table-III-3. Table-III-3 shows that more than 32 per cent of the adult population of sample households were illiterate, while 68 per cent adult population of sample farmers were literate. However, 49 per cent of adult population were educated upto secondary level. The primary level education was received by 18.69 per cent of adult population. Among the adult population of different categories of sample farms, table-III-3 shows that illiteracy percentage in adult population was higher being 42.86 per cent on the small farms followed by 25.27 per cent on medium sample farms. The adult population of marginal farms had higher literacy than other sample farms of the district.

Table-III-3

Educational Profile of the Adult Population in NFSM District Lalitpur

(Nos)

Groups	Illiterates	Primary	Secondary and Above	Total
Marginal	4	3	18	25
Small	42	15	41	98
Medium	23	22	46	91
Large	--	--	--	--
Total	69	40	105	214

% Distribution of Adult Educated Population in NFSM District Lalitpur

(%)

Groups	Illiterates	Primary	Secondary and Above	Total
Marginal	16.00	12.00	72.00	100
Small	42.86	15.30	41.84	100
Medium	25.27	24.18	50.55	100
Large	--	--	--	100
Total	32.24	18.69	49.07	100

IV. Caste Composition

The caste composition of sample farmers is presented in table-III-4. This table indicates that 54 per cent of the total selected households were SC followed by 36.00 per cent and 10.00 per cent of OBC and other (general) castes respectively. The SC caste was maximum being 66.67 per cent on small size group of holdings while OBC was maximum in number on marginal size group of holdings. The general castes belonged to medium and small size groups of holdings. It reflects that the SC and OBC were dominant castes on selected sample farms.

Table-III-4
Caste Composition in NFSM District Lalitpur

(No. of HHlds)					
Groups	SC	ST	OBC	Others	Total
Marginal	4	--	4	--	8
Small	18	--	8	1	27
Medium	5	--	6	4	15
Large	--	--	--	--	--
Total	27	--	18	5	50

% Distribution of Caste Composition: NFSM District

(%)					
Groups	SC	ST	OBC	Others	Total
Marginal	50.00	--	50.00	--	100
Small	66.67	--	29.63	3.70	100
Medium	33.33	--	40.00	26.67	100
Large	--	--	--	--	100
Total	54.00	--	36.00	10.00	100

Non-NFSM District Allahabad

I. Demographic Profile

The demographic profile of sample farmers of Non-NFSM district Allahabad is presented in table-III-5. Table-III-5 shows that out of total population of 306 of sample households, the number of males were more being 99 against, 89 numbers of females. Out of total adult population of 188, the share of male members accounted for 52.66 per cent against 47.34 per cent of female members.

Table-III-5
Demographic Profile in Non NFSM District Allahabad

(Nos)

Groups	Adults			Children	Total
	Males	Females	Total		
Marginal	9	10	19	14	33
Small	12	13	25	15	40
Medium	75	63	138	89	227
Large	3	3	6	--	6
Total	99	89	188	118	306

II. Educational profile of heads of households

The educational profile of the heads of households of sample of farmers of Non-NFSM district Allahabad is analyzed in table-III-6. Table-III-6 shows that 45 heads of households were literate and remaining 5 were only illiterate. Thus, the literacy percentage among the heads of households was much higher than illiterate percentage. The heads of households of marginal category of farms were mostly illiterate. The number of educated heads of households were higher on medium size of farms followed by large size of farms. It is also evident from table-III-6 that out of total educated heads of households, 37 were educated above the secondary level and only 8 were educated upto primary level. This shows that heads of the households were well educated across the size of farms.

Table-III-6
Education of the Heads in Non NFSM District Allahabad

(No. of HHlds)

Groups	Illiterates	Primary	Secondary and Above	Total
Marginal	4	--	2	6
Small	--	4	2	6
Medium	1	4	32	37
Large	--	--	1	1
Total	5	8	37	50

% Distribution of Education of the Heads in Non NFSM District Allahabad

(%)

Groups	Illiterates	Primary	Secondary and Above	Total
Marginal	66.67	--	33.33	100
Small	--	66.67	33.33	100
Medium	2.70	10.81	86.49	100
Large	--	--	100.00	100
Total	10.00	16.00	74.00	100

III. Educational Profile of the Adult Population

The educational profile of the adult population of sample farms of Non-NFSM district Allahabad is presented in table-III-7. Table-III-7 indicates that of the total adult population of 188, only 13.30 per cent were illiterate, while 86.70 per cent of adult population were literate. Out of total literate adult population of 163, more than 89 per cent adult population had received education upto secondary level and only 11 per cent were educated upto primary level. The literacy was maximum among the adult population on large and medium size of farms. None was illiterate of adult population of large size of farms.

Table-III-7

Educational Profile of the Adult Population in Non NFSM District Allahabad

(Nos)

Groups	Illiterates	Primary	Secondary and Above	Total
Marginal	12	1	6	19
Small	1	4	20	25
Medium	12	12	114	138
Large	--	--	6	6
Total	25	17	146	188

% Distribution of Adult Educated Population in Non NFSM District Allahabad

(%)

Groups	Illiterates	Primary	Secondary and Above	Total
Marginal	63.16	5.26	31.58	100
Small	4.00	16.00	80.00	100
Medium	8.70	8.70	82.60	100
Large	--	--	100.00	100
Total	13.30	9.04	77.66	100

IV. Caste Composition

The caste composition of sample farmers of Non-NFSM district Allahabad is analyzed in table-III-8. Table-III-8 shows that out of total 50 sample households, the majority of sample households being 88 per cent belonged to OBC. The SC and other castes accounted for 8 per cent and 4 per cent respectively. Thus, there was preponderance of the OBCs on the sample farms. It is also noticed from table-III-8 that SC belonged to only marginal size of sample farms while general castes belonged to only medium size of sample farms.

Table-III-8
Caste Composition in Non NFSM District Allahabad

(No. of HHlds)

Groups	SC	ST	OBC	Others	Total
Marginal	4	--	2	--	6
Small	--	--	6	--	6
Medium	--	--	35	2	37
Large	--	--	1	--	1
Total	4	--	44	2	50

% Distribution of Caste Composition in Non NFSM District Allahabad

(%)

Groups	SC	ST	OBC	Others	Total
Marginal	66.67	--	33.33	--	100
Small	--	--	100.00	--	100
Medium	--	--	94.59	4.41	100
Large	--	--	100.00	--	100
Total	8.00	--	88.00	4.00	100

Table-III-9
Caste-wise Population of Sample Households in Non-NFSM District Allahabad

(Nos)

Castes	Marginal				Small				Medium				Large				Total			
	M	F	C	T	M	F	C	T	M	F	C	T	M	F	C	T	M	F	C	T
SC	7	7	8	22	--	--	--	--	--	--	--	--	--	--	--	--	7	7	8	22
ST	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
OBC	2	3	6	11	12	13	15	40	70	58	80	208	3	3	--	6	87	77	106	265
General	--	--	--	--	--	--	--	--	5	5	9	19	--	--	--	--	5	5	9	19
Total	9	10	14	33	12	13	15	40	75	63	89	227	3	3	--	6	99	89	118	306

3.2 Crop-structural Component

I. **Cropping Pattern on the Sample Farms of NFSM district Lalitpur**

The cropping pattern on the sample farms of district (NFSM) Lalitpur is given in table-III-10. The data of area under different crops on the sample farms presented in table-III-10 are the average of three years i.e. from 2006-07 to 2008-09. Table-III-10 shows that wheat and pulses were dominant crops on the sample farms. Of the total GCA of 226.35 hectares, the pulses accounted for 74.25 per cent followed by 20.51 per cent of wheat during triennium ending year 2009. The other major crops occupied only 5.24 per cent area to GCA during the same period. Table-III-10 also shows that percentage area under pulses of total GCA during triennium year ending 2009 was maximum on marginal size of farms followed by medium size of farms. While wheat accounted for maximum share being 25.78 per cent to GCA on the small size of farms followed by 17.66 per cent on medium size of farms. Table-III-10 reveals that pulses were major crops across the size of farms. The rice crop was not grown by the sample farmers. The crops of Zaid season were also not sown by the sample farmers during the reference year of the study.

Table-III-10

Cropping Pattern – Overall Seasons in NFSM District Lalitpur

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

Groups	Area Sown (area in hectare)				
	Rice	Wheat	Other Major Crops	Pulses	Total
Marginal	--	1.95	0.40	10.16	12.52
Small	--	21.29	6.45	54.84	82.59
Medium	--	23.18	5.01	103.04	131.24
Large	--	--	--	--	--
Total	--	46.42	11.86	168.06	226.35
	Percentage of Total Area Sown				
	Rice	Wheat	Other Major Crops	Pulses	Total
Marginal	--	15.58	3.19	81.23	100
Small	--	25.78	7.81	66.41	100
Medium	--	17.66	3.82	78.52	100
Large	--	--	--	--	100
Total	--	20.51	5.24	74.25	100

II. Season wise Cropping Pattern (Average of 2006-07, 2007-08 and 2008-09)

The season-wise cropping pattern on the sample farms are presented in table-III-11. This table indicates that the area under kharif and rabi crops was more or less equal. Out of total GCA of 226.34 hectares, the kharif season crops accounted for 49.96 per cent against 50.04 per cent of rabi season crops. This type of tendency was also witnessed in different size of farms. It is also evident from table that area under pulses of kharif season was higher by about 51 per cent over the area of 66.85 hectares of rabi pulses. The other major crops of kharif season accounted for 5.24 per cent of GCA while no other major crops were grown in rabi season. Wheat and pulses were sown only by the sample farmers in rabi season. Wheat crop accounted for 20.51 per cent of GCA. It is also noticed from table that there was very marginal variation in cropping pattern on different size of farms. Area under pulses in different sample size of farms was higher than that of area under wheat and other major crops.

Table-III-11
Season wise Cropping Pattern in NFSM District Lalitpur
(Average of 2006-07, 2007-08, 2008-09)

Groups	Kharif (area in hectare)				
	Rice	Wheat	Other Major Crops	Pulses	Total
Marginal	--	--	0.40	5.98	6.38
Small	--	--	6.45	34.91	41.36
Medium	--	--	5.01	60.32	65.33
Large	--	--	--	--	--
Total	--	--	11.86	101.21	113.07
	Rabi				
	Rice	Wheat	Other Major Crops	Pulses	Total
Marginal	--	1.95	--	4.18	6.13
Small	--	21.29	--	19.93	41.22
Medium	--	23.18	--	42.74	65.92
Large	--	--	--	--	--
Total	--	46.42	--	66.85	113.27
	Zaid				
	Rice	Wheat	Other Major Crops	Pulses	Total
Marginal	NA	NA	NA	NA	NA
Small	NA	NA	NA	NA	NA
Medium	NA	NA	NA	NA	NA
Large	NA	NA	NA	NA	NA
Total	NA	NA	NA	NA	NA

I. Cropping Pattern on the Sample Farms of Non-NFSM District Allahabad

The average size group-wise cropping pattern from 2006-07 to 2008-09 on the sample farms of Non-NFSM district Allahabad is analyzed in table-III-12. Table-III-12 shows that out of the GCA of 384.47 hectares, pulses alone accounted for 41.96 per cent followed by 24.38 per cent and 20.05 per cent of rice and wheat respectively. Thus, the area under cereals was maximum being 44.43 per cent to GCA followed by 41.96 per cent for pulses. It is also evident from table-III-12 that the percentage share of area under pulses of GCA decreases with increase in the size of farms. It reflects that marginal sample farmers had devoted much area under pulses to GCA than medium and large sample farmers. The other major crops accounted for only 13.61 per cent to GCA which was more or less equal in different categories of farms except on marginal size of farms.

Table-III-12

Cropping Pattern – Overall Seasons: Non NFSM District Allahabad

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

Groups	Area Sown (area in hectare)				
	Rice	Wheat	Other Major Crops	Pulses	Total
Marginal	0.63	--	0.17	2.36	3.16
Small	4.67	3.05	2.07	7.75	17.54
Medium	81.43	67.36	47.08	142.81	338.68
Large	7.00	6.67	3.00	8.42	25.09
Total	93.73	77.08	52.32	161.34	384.47
	Percentage of Total Area Sown				
	Rice	Wheat	Other Major Crops	Pulses	Total
Marginal	19.96	--	5.28	74.76	100
Small	26.62	17.39	11.80	44.19	100
Medium	24.04	19.89	13.90	42.17	100
Large	27.91	26.58	11.96	33.55	100
Total	24.38	20.05	13.61	41.96	100

II. Season-wise Cropping Pattern in Non-NFSM District Allahabad (average of 2006-07, 2007-08 and 2008-09)

The season wise cropping pattern (average of 2006-07, 2007-08 and 2008-09) is analyzed in table-III-13. This table shows that out of GCA, the kharif season crops accounted for 51.90 per cent while rabi season crops accounted for 48.10 per cent. This shows that area under kharif season crops was slightly higher by 3.80 per cent over the area under rabi season crops. As far as season wise area under pulses is concerned, table-III-13 shows that area under rabi pulses was much higher by two times over the area under kharif pulses. It shows that sample farmers had devoted large area under rabi pulses than the area under kharif pulses out of GCA, the rabi pulses accounted for 28 per cent against 13.96 per cent under kharif pulses.

Table-III-13

Season wise Cropping Pattern in Non NFSM District Allahabad

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

Groups	Kharif (Hectares)				
	Rice	Wheat	Other Major Crops	Pulses	Total
Marginal	0.63	--	0.17	--	0.80
Small	4.67	--	2.07	2.10	8.84
Medium	81.43	--	46.92	48.57	176.92
Large	7.00	--	3.00	3.00	13.00
Total	93.73	--	52.16	53.67	199.50
	Rabi (Hectares)				
	Rice	Wheat	Other Major Crops	Pulses	Total
Marginal	--	--	--	2.36	2.36
Small	--	3.05	--	5.65	8.70
Medium	--	67.36	0.17	94.24	161.77
Large	--	6.67	--	5.42	12.09
Total	--	77.08	0.17	107.67	184.92
	Zaid				
	Rice	Wheat	Other Major Crops	Pulses	Total
Marginal	NA	NA	NA	NA	NA
Small	NA	NA	NA	NA	NA
Medium	NA	NA	NA	NA	NA
Large	NA	NA	NA	NA	NA
Total	NA	NA	NA	NA	NA

3.3 Area under Pulses on Sample Farms in NFSM District Lalitpur (Average of 2006-07, 2007-08 and 2008-09)

The area under different pulses is presented in table-III-14, III-15, and III-16. Table-III-14 shows that urd and moong were main kharif pulses while the pea was only rabi pulse. Of the total area under pulses, 55.48 per cent area covered by urd followed by 39.78 per cent, 4.75 per cent for pea and moong respectively during triennium year ending 2009. It shows that urd and pea were major pulse crops on the sample farms. This type of coverage of area under pulses was also noticed on different size of farms during the same period. The marginal sample farmers did not grow the moong on their farms.

Table-III-14
Area under Pulses in NFSM District Lalitpur

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

Groups	Area Sown (area in hect.)				
	Urd	Moong	Pea	Pulses Crop-4	Total
Marginal	5.98	--	4.19	--	10.17
Small	34.62	0.30	19.93	--	54.85
Medium	52.65	7.67	42.73	--	103.05
Large	--	--	--	--	--
Total	93.25	7.97	66.85	--	168.07
	Percentage of Area Sown				
	Urd	Moong	Pea	Pulses Crop-4	Total
Marginal	58.80	--	41.20	--	100
Small	63.12	0.55	36.33	--	100
Medium	51.09	7.44	41.47	--	100
Large	--	--	--	--	100
Total	55.48	4.74	39.78	--	100

Table-III-15

Season wise Area under Pulses in NFSM District Lalitpur

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

Groups	Kharif (area in hect.)				
	Urd	Moong	Pulses Crop-3	Pulses Crop-4	Total
Marginal	5.98	--	--	--	5.98
Small	34.62	0.30	--	--	34.92
Medium	52.65	7.67	--	--	60.32
Large	--	--	--	--	--
Total	93.25	7.97	--	--	101.22
	Rabi				
	Pea	Pulses Crop-2	Pulses Crop-3	Pulses Crop-4	Total
Marginal	4.19	--	--	--	4.93
Small	19.93	--	--	--	19.93
Medium	42.73	--	--	--	42.73
Large	--	--	--	--	--
Total	66.85	--	--	--	66.83
	Zaid				
	Pulses Crop-1	Pulses Crop-2	Pulses Crop-3	Pulses Crop-4	Total
Marginal	NA	NA	NA	NA	NA
Small	NA	NA	NA	NA	NA
Medium	NA	NA	NA	NA	NA
Large	NA	NA	NA	NA	NA
Total	NA	NA	NA	NA	NA

Share of Different size-Groups in Pulses Farming

The share of different size groups in pulses farming is shown in table-III-16. As mentioned earlier that urd, moong and pea were main pulse crops grown by sample farmers of NFSM district Lalitpur during triennium ending year 2008-09. The area under urd accounted for 55.49 per cent of total area under pulses followed by 39.78 per cent for pea. The allocation of area under pulses on different size of farms was more or less stagnant during triennium year ending 2008-09. The percentage share of marginal farmers in total pulses farming has slightly increased from 5.65 per cent in 2006-07 to 6.28 per cent in 2008-09. Against this, the percentage share of

area under pulses on medium size of sample farms has marginally decreased from 61.85 per cent in 2006-07 to 60.87 per cent in 2008-09. It is also noticed from table-III-16 that area under pulses on the sample farms was 166.45 hectares in 2006-07 which has increased to 169.70 hectares in 2008-09, thereby showing 2.13 per cent increase over the period. It may be concluded with this result that area under pulses on different size of sample farms was more or less stagnant during the study period.

Table-III-16
Share of Different Size-Groups in Pulse Farming in NFSM District Lalitpur
(Area in Hectare)

Groups	2006-2007		2007-2008		2008-2009	
	Total Area Under Pulses	% Share to Total	Total Area Under Pulses	% Share to Total	Total Area Under Pulses	% Share to Total
Marginal	9.40	5.65	10.45	6.22	10.65	6.28
Small	54.10	32.50	54.70	32.55	55.75	32.85
Medium	102.95	61.85	102.90	61.23	103.30	60.87
Large	--	--	--	--	--	--
Total	166.45	100.00	168.05	100.00	169.70	100.00

Area under Pulses on Sample Farms in Non-NFSM district Allahabad

Season wise area under pulses on the sample farms in Non-NFSM district Allahabad (average of 2006-07, 2007-08 and 2008-09) is presented in table-III-17. It is evident from table-III-17 that urd and arhar were sown in kharif season while masoor and gram were sown in rabi season by the sample farmers. Out of total area under pulses, urd accounted for 17.04 per cent followed by 16.21 per cent of arhar. Both pulses accounted for 33.25 per cent of total area of pulses in kharif season. While masoor and gram were grown in rabi season by sample farmers of the district. Of the total area of pulses, masoor accounted for 49.83 per cent followed by 16.91 of gram. Among the pulses, masoor was main pulse crop occupying 49.83 per cent of total area under pulses during triennium year ending 2009.

Table-III-17**Area Under Pulses in Non-NFSM District Allahabad**

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

Groups	Area Sown (area in hect.)				
	Urd	Arhar	Masoor	Gram	Total
Marginal	--	--	2.36	--	2.36
Small	--	2.10	3.88	1.77	7.75
Medium	24.83	23.73	71.33	22.92	142.81
Large	2.67	0.33	2.83	2.59	8.42
Total	27.50	26.16	80.40	27.28	161.34
	Percentage of Area Sown				
	Urd	Arhar	Masoor	Gram	Total
Marginal	--	--	100.00	--	2.36
Small	--	27.10	50.11	22.79	7.75
Medium	17.39	16.62	49.94	16.05	142.81
Large	31.68	3.96	33.67	30.69	8.42
Total	17.05	16.21	49.83	16.91	161.34

It is also noticed from table-III-18 that rabi pulses namely masoor and gram were much preferred by sample farmers of all categories than the kharif pulses. Table-III-18 reveals that area under pulses on different size of farms was maintaining decreasing trend from 2006-07 to 2008-09. It was only exception on marginal sample farms.

Table-III-18

Area Under Pulses-Season wise in Non NFSM District Allahabad

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

Groups	Kharif (Hect.)				
	Urd	Arhar	Pulses Crop-3	Pulses Crop-4	Total
Marginal	--	--	--	--	--
Small	--	2.10	--	--	2.10
Medium	24.83	23.73	--	--	48.56
Large	2.67	0.33	--	--	3.00
Total	27.50	26.16	--	--	53.66
	Rabi (Hect.)				
	Masoor	Gram	Crop-3	Crop-4	Total
Marginal	2.36	--	--	--	2.36
Small	3.88	1.77	--	--	5.65
Medium	71.33	22.92	--	--	94.25
Large	2.83	2.59	--	--	5.42
Total	80.40	27.28	--	--	107.68
	Zaid				
	Crop-1	Crop-2	Crop-3	Crop-4	Total
Marginal	NA	NA	NA	NA	NA
Small	NA	NA	NA	NA	NA
Medium	NA	NA	NA	NA	NA
Large	NA	NA	NA	NA	NA
Total	NA	NA	NA	NA	NA

It is also evident from table-III-18 that marginal farmers had not sown urd, arhar and gram during the triennium year ending 2009. Only masoor was sown during the same period. The area under pulses was more or less same in all categories of farms during the study period.

Share of Different Size-groups in Pulse Farming in Non-NFSM district Allahabad

Table-III-19 reveals that area under pulses on the sample farms was 164.03 hectares in 2006-07 which has decreased to 159.77 hectares in 2008-09 there by showing 2.67 per cent decrease over the period. The total area under pulses on the sample farm in Non-NFSM district Allahabad was marginally decreasing continuously from 2006-07 to 2008-09. The maximum decrease in area under pulses was on the large sample farms followed by on small size group of holding. Against this, the area under pulses on the marginal farms has been increasing from 2006-07 to 2008-09.

Table-III-19
Share of Different Size-Groups in Pulse Farming in Non-NFSM District Allahabad
(Hect.)

Group	2006-2007		2007-2008		2008-2009	
	Total Area Under Pulses	% Share to Total	Total Area Under Pulses	% Share to Total	Total Area Under Pulses	% Share to Total
Marginal	2.38	67.81	2.35	78.85	2.35	78.85
Small	8.15	45.15	7.55	43.64	7.55	43.77
Medium	144.50	41.87	142.30	42.21	141.62	42.43
Large	9.00	36.00	8.00	32.00	8.25	32.67
Total	164.03	41.88	160.20	41.90	159.77	42.12

3.4 Irrigation

Sources of Irrigation

I. NFSM District Lalitpur

The details of irrigated land on sample farms of Lalitpur district is presented in table-III-20. Table-III-20 shows that out of total cultivated area of 114.40 hectares, 99.12 per cent land was irrigated by canal and tube-well during 2008-09. It shows that almost all cultivated land of

sample farmers of Lalitpur district was irrigated. Table-III-20 also shows that canal and tube-well were two main sources of irrigation. Of the total irrigated area of 114.40 hectares, canal accounted for 72.94 per cent followed by 26.18 per cent by tube-wells. It is also evident from table-III-20 the percent share of irrigated land by tube-wells decreases with increase in the size of farms, while it was just reverse in case of canal. It also witnessed from table-III-20 that the, maximum area of cultivated land of sample farmers of all categories was irrigated by canal.

Table-III-20

Irrigation Details in NFSM District Lalitpur
(Area Irrigated in hectare)

Groups	Irrigated					Unirrigated	Total
	Canal	Tubewell	Tank	Others	Total		
Marginal	3.90	2.50	--	--	--	0.05	6.45
Small	28.52	12.55	--	--	--	0.33	41.40
Medium	51.02	14.90	--	--	--	0.63	66.55
Large	--	--	--	--	--	--	--
Total	83.44	29.95	--	--	--	1.01	114.40

% Distribution of Irrigated Area By Source: NFSM District Lalitpur

(%)

Groups	Irrigated					Unirrigated	Total
	Canal	Tubewell	Tank	Others	Total		
Marginal	60.46	38.76	--	--	99.22	0.78	100
Small	68.88	30.32	--	--	99.20	0.80	100
Medium	76.66	22.39	--	--	99.05	0.95	100
Large	--	--	--	--	--	--	100
Total	72.94	26.18	--	--	99.12	0.88	100

II. Non-NFSM District Allahabad

The details of irrigated land by different sources on the sample farms during 2008-09 is given in table-III-21. It can be observed from table-III-21 that out of the total cultivated land of 214.88 hectares, 61.51 per cent was irrigated while 38.49 per cent was unirrigated. It shows that a large chunk of cultivated land being 38.49 per cent was un-irrigated. It is also evident from this table that large portion of cultivated land being 84.33 per cent on the marginal size group of holding was un-irrigated. The irrigated area increases with increase in size of farms (Table-III-21). It

shows that the large sample farmers had better irrigation facilities than the small and marginal sample farmers. As far as sources wise of irrigation is concerned, table-III-21 shows that canal, tube-well were sources of irrigation across the size of farms. Almost all land of sample farmers were only irrigated by canal and tube-wells. Out of total irrigated land of 132.18 hectares, 92.90 per cent land was irrigated by canal and rest 7.10 per cent was irrigated by tube-wells (Table-III-21).

Table-III-21

Irrigation Details in Non NFSM District Allahabad
(Area Irrigated) (Hect.)

Groups	Irrigated					Unirrigated	Total
	Canal	Tubewell	Tank	Others	Total		
Marginal	0.30	0.08	--	--	0.38	2.00	2.38
Small	6.60	0.40	--	--	7.00	4.10	11.10
Medium	106.40	8.40	--	--	114.80	73.60	188.40
Large	9.50	0.50	--	--	10.00	3.00	13.00
Total	122.80	9.38	--	--	132.18	82.70	214.88

% Distribution of Irrigated Area by Source in Non NFSM District Allahabad

Groups	Irrigated					Unirrigated	Total
	Canal	Tubewell	Tank	Others	Total		
Marginal	12.60	3.36	--	--	15.97	84.33	100
Small	59.46	3.60	--	--	63.06	36.94	100
Medium	56.47	4.46	--	--	60.93	39.07	100
Large	73.08	3.84	--	--	76.92	23.08	100
Total	57.15	4.36	--	--	61.51	38.49	100

Crop-wise Irrigation

III. NFSM District Lalitpur

The irrigated area under pulses (average 2006-07, 2007-08 and 2008-09) is shown in table-III-22. It has been already mentioned that urd, moong and pea were grown by the sample farmers of Lalitpur district. The urd and moong are kharif pulses, so these do not need water. Therefore,

these crops were not irrigated by sample farmers. While the total area under pea was fully irrigated by the all categories of sample farmers.

Table-III-22

Season-wise Irrigated area under Pulses in NFSM District Lalitpur

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

Groups	Irrigated Area (area in hect.)				
	Urd	Moong	Crop-3	Crop-4	Total
Marginal	--	--	--	--	--
Small	--	--	--	--	--
Medium	--	--	--	--	--
Large	--	--	--	--	--
Total	--	--	--	--	--
	Total Area Under the Crop				
	Pea	Crop-2	Crop-3	Crop-4	Total
Marginal	4.19	--	--	--	4.19
Small	19.93	--	--	--	19.93
Medium	42.73	--	--	--	42.73
Large	--	--	--	--	--
Total	66.85	--	--	--	66.85
	% of Irrigated Area				
	Urd	Moong	Pea	Crop-4	Total
Marginal	--	--	100	--	100
Small	--	--	100	--	100
Medium	--	--	100	--	100
Large	--	--	100	--	100
Total	--	--	100	--	100

The crop-wise share of irrigated area on the sample farms of NFSM district Lalitpur (average of 2006-07, 2007-08 and 2008-09) is presented in table-II-23. It can be observed from this table that out of gross irrigated area of 113.27 hectares, the share of pulses was higher being 59.02 per cent than the percentage share of 40.98 of wheat crops. Total area of pea and wheat was fully irrigated by all categories of sample farmers of the Lalitpur district.

Table-III-23**Crop-wise Share in Irrigated Area in NFSM District Lalitpur**

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

Groups	Area Irrigated (Hect.)			
	Pulses	Wheat	All other Crops	Total GIA
Marginal	4.19	1.95	--	6.14
Small	19.93	21.29	--	41.22
Medium	42.73	23.18	--	65.91
Large	--	--	--	--
Total	66.85	46.42	--	113.27
	% of Area Irrigated			
	Pulses	Wheat	All other Crops	Total
Marginal	68.24	31.76	--	100
Small	48.35	51.65	--	100
Medium	64.83	35.17	--	100
Large	--	--	--	100
Total	59.02	40.98	--	100

IV. Non-NFSM District Allahabad

It has been already mentioned that urd, arhar, masoor and gram were sown by the sample farmers of Allahabad district. Among 4 pulse crops, urd was not irrigated by the sample farmers while only 19.59 per cent of total area under arhar was irrigated by medium size of sample farmers. Since, these two are kharif season crops, hence these did not require water. Out of total area under masoor, only 28.39 per cent area was irrigated while 52.02 per cent of total area of gram was irrigated by the sample farmers. Almost all pulse crops grown by the sample farmers did not require much water. These are generally un-irrigated crops and are sown in un-irrigated land. The crop-wise share in irrigated area table-III-25 reveals that out of total gross irrigated area of 223.25 hectares, wheat accounted for 76.51 per cent followed by 23.49 per cent of pulses. It is also evident from table-III-25 that percent share of irrigated area of pulses decreases with the

increase in size of farms while it was reverse in case of wheat crop. Almost entire area of wheat on the sample farms was fully irrigated.

Table-III-24

Season-wise Irrigated Area under Pulses in Non NFSM District Allahabad

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

Groups	Irrigated Area (Hect.)				
	Urd	Arhar	Masoor	Gram	Total
Marginal	--	--	0.36	--	0.36
Small	--	--	1.10	1.78	2.88
Medium	--	10.27	13.43	22.92	46.62
Large	--	--	--	2.50	2.58
Total	--	10.27	14.89	27.28	52.44
	Total Area Under the Crop (Hect.)				
	Urd	Arhar	Masoor	Gram	Total
Marginal	--	--	2.36	--	2.36
Small	--	2.10	3.88	1.78	7.76
Medium	24.83	23.73	71.32	22.92	142.80
Large	2.67	0.33	2.83	2.58	8.41
Total	27.50	26.16	80.39	27.28	161.33
	% of Irrigated Area				
	Urd	Arhar	Masoor	Gram	Total
Marginal	--	--	100.00	--	100
Small	--	--	38.19	61.81	100
Medium	--	22.03	28.81	49.16	100
Large	--	--	--	100.00	100
Total	--	19.59	28.39	52.02	100

Table-III-25

Crop-wise Share in Irrigated Area: Non NFSM District Allahabad

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

Groups	Area Irrigated (Hect.)			
	Pulses	Wheat	All other Crops	Total GIA
Marginal	0.36	0.63	--	0.99
Small	2.88	7.72	--	10.60
Medium	46.62	148.79	--	195.41
Large	2.58	13.67	--	16.25
Total	52.44	170.81	--	223.25
	% of Area Irrigated			
	Pulses	Wheat	All other Crops	Total
Marginal	36.36	63.64	--	100
Small	27.17	72.83	--	100
Medium	23.86	76.14	--	100
Large	15.88	84.12	--	100
Total	23.49	76.51	--	100

CHAPTER-IV

ECONOMICS OF PULSES CULTIVATION

An attempt has been made in this chapter to analyse the economics of pulses cultivation i.e. return on individual pulses and other major crops grown by the sample farmers of Lalitpur (NFSM) and Allahabad (Non-NFSM) districts. The comparative analysis of profitability of pulses and other major crops has also been worked out in this chapter.

4.1 Individual Pulse Crops in NFSM and Non- NFSM Districts:

It has been already mentioned in 3rd chapter of this report that urd, moong and pea were main pulse crops on the sample farms of NFSM district Lalitpur while urd, arhar, masoor and gram were main pulse crops on the sample farms of Non-NFSM district Allahabad during the reference years.

I. Individual Pulse Crops in NFSM district Lalitpur District:

I. Urd:

Urd is main pulse crop of Kharif season of Lalitpur district. Of the total 50 selected farmers, all the sample farmers had sown urd on their cultivated land. This crop occupied 41.21 per cent to total cropped area in 2008-09. This crop accounted for 55.18 per cent to total area under pulses during the same year. The costs, gross income and net return of urd are presented in Table-IV-1 which shows that gross return as well as net return per hectare have increased from 2006-07 to 2008-09 by 28.51 per cent and 35.78 per cent respectively. This type of trend is also witnessed in different size of groups. The net-return per qtl was Rs. 1310 in 2006-07 which has increased to Rs. 1641 in 2008-09, there by showing 25.27 per cent increase over the period. It is also noticed from table-IV.1 that per qtl net return has increased impressively from 2006-07 to 2008-09, on medium sample farms than that of other groups of sample farms. The increase in net return per hectare and per qtl was due to increase in productivity and hike in-price of urd from 2006-07 to 2008-09. It is also witnessed from table- IV-1 that gross return per hectare and net per qtl have been maintaining an increasing trend from 2006-07 to 2008-09 on the all size of sample farms.

Table- IV-1

Profitability of Pulses Farming in NFSM District Lalitpur: Pulse Crop-Urd

(Value in Rs)

Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	94370	35154	59216	16412	10298	1978	1241	89340
2007-08	106927	38657	68270	17529	11192	2072	1323	100685
2008-09	123214	39655	83559	20199	13698	2222	1507	129220
Small								
2006-07	609105	227607	381498	17681	11074	1890	1184	596460
2007-08	747042	209180	537862	21560	15523	2085	1501	730858
2008-09	823752	234661	589091	23705	16952	2247	1607	820850
Medium								
2006-07	1012320	285979	726341	19338	13875	1945	1395	1004060
2007-08	1142420	322816	819604	21637	15523	2107	1512	1100620
2008-09	1284260	353450	930810	24323	17629	2314	1677	1261080
Large								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Total								
2006-07	1715795	548740	1167055	18539	12610	1926	1310	1689860
2007-08	1996389	570653	1425736	21340	15240	2097	1498	1932163
2008-09	2231226	627766	1603460	23825	17122	2283	1641	2211150

II. Moong:

Moong is also a pulse crop of kharif season of Lalitpur district. But it is not important than urd. Since, the production of this crop was not so promising, therefore, it did not occupy larger area to GCA. It was mostly grown on upland by the 8 sample farmers of this district. Out of GCA of the sample farms of this district, it accounted for only 3.43 per cent area during reference period. It has also occupied only 4.60 per cent area to total area under pulses on the sample farms. The details of net return per hectare and net return per qtl were worked out in Table-IV-2. Table-IV-2 reveals that this crop was grown by only small and medium sample farmers, while marginal sample farmers had not grown this crop during the study years (from 2006-07 to 2008-09). The area under moong was stagnant between 2006-07 and 2008-09 on the small size group of sample farms against this, area under this crop was 8.00 hectares on medium size group of farms in 2006-07 which had decreased to 7.50 hectares in 2008-09. The gross return per qtl was estimated at Rs. 2,044 in 2006-07 which has increased to Rs. 2,717 per qtl in 2008-09, showing 32.93 per cent increase over the period. The per hectare net return was in increasing trend on small and medium size groups of farms. The increase was more on small than on medium size of farms. It is also noticed from Table-IV-2 that net return per qtl was Rs. 2,044 in 2006-07 which has increased to Rs. 2,249, showing 10.03 per cent increase over the period. The gross return per qtl was higher being Rs. 2,720 in 2008-09 on medium size of farms than Rs.2,623 on small size of farms. However, the net return per qtl witnessed an increasing trend on both size of farms from 2006-07 to 2008-09, but it was a little bit higher on medium size of farms than small size group of farms. The increase in net return per hectare and per qtl was due to increase in the price of moong in 2008-09. The analysis reflects that return was higher on medium size of farms than small size of farms. This was due to higher productivity of this crop on medium size of farms than the small size of farms. However, the paid out costs has been increasing from 2006-07 to 2008-09. The variations in gross and net return per qtl among different size group of holdings were not so wide. This crop was profitable on the selected farms.

Table-IV-2

Profitability of Pulses Farming in NFSM District Lalitpur: Pulse Crop-Moong

(Rs)

Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Small								
2006-07	5850	1518	4332	19500	14440	1950	1444	4850
2007-08	6150	1867	4283	20500	14277	2050	1427	5375
2008-09	7900	1930	5970	26333	19900	2633	1990	6550
Medium								
2006-07	180200	30236	149964	22525	18745	2048	1704	217100
2007-08	208250	32272	175978	27767	23464	2421	2046	225530
2008-09	233900	39736	194164	31187	25889	2720	2258	243410
Large								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Total								
2006-07	186050	31754	154296	22415	18589	2044	2044	221950
2007-08	214400	34139	180261	27487	23110	2409	2025	230905
2008-09	241800	41666	200134	31000	25658	2717	2249	249960

III. Pea :

The pea is only rabi pulse which was grown by all the sample farmers of Lalitpur. It occupied 30.03 per cent area to GCA of sample farmers in the reference year. The area under pea was 27.38 per cent 29.38 per cent 30.03 per cent to GCA in 2006-07, 2007-08 and 2008-09

respectively. There was mostly stagnant trend on all size of farms. Thus, it was very popular pulse crop among the sample farmers of this district. The details of costs of cultivation and its profitability per hectare and per qtl are presented in Table-IV-3. It is apparent from Table- IV-3 that over all the net return per hectare and net return per qtl were Rs. 24,670 and Rs 1,467 respectively in 2008-09. The net return per hectare was Rs. 16,811 in 2006-07 which has gone upto Rs. 24,670 in 2008-09. Showing 46.75 per cent increase over the period. In the same manner net return per qtl has also increased to Rs 1,467 in 2008-09 from Rs. 1086 in 2006-07, there by showing 35.08 per cent increase over the period. It shows that net return per hectare and per qtl have been increasing from year to year since 2006-07.

It is also noticed from table-IV-3 that return per hectare and per qtl has been in the increasing trend from 2006-07 to 2008-09 on all size of the selected farms. The pace of increase was also more or less, same among the different size of sample farms. Per hectare paid out costs was estimated at Rs. 9,499 in 2008-09 against gross income per hectare of Rs. 34,170. Thus, net return per hectare was worked out to Rs. 24,670 in 2008-09. It may be concluded with this result that pea was most profitable pulse on the sample farms of NFSM Lalitpur district of U.P. On account of this, sample farmers have been increasing the area under pea year by year.

Table-IV-3 also shows that per hectare return has increased more on the small size of sample farms than on the marginal and medium size of sample farms, while the net return per qtl has increased much more on medium size of sample farms than that on other sample farms. It shows that the return per hectare and per qtl of pea have been increasing from 2006-07 to 2008-09 on the selected farms. The reason for increasing the net return per hectare and per qtl was due to increase in production and hike in price of pea year by year.

Table-IV-3
Profitability of Pulses Farming in NFSM District Lalitpur: Pulse Crop-Pea

(Rs)

Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	126400	35540	90860	34630	24893	1532	1101	162340
2007-08	151591	39430	112161	34848	25784	1761	1303	148083
2008-09	173979	42944	131035	38237	28798	1735	1306	168350
Small								
2006-07	528692	173400	355292	27322	18361	1725	1159	532180
2007-08	613541	180425	433116	31065	21930	1895	1337	637425
2008-09	781322	200653	580669	37745	28052	2063	1533	816848
Medium								
2006-07	1020035	363370	656665	23944	15515	1628	1048	1119355
2007-08	1168790	389242	779548	27436	18299	1788	1193	1241705
2008-09	1376778	404744	972034	32018	22605	2059	1454	1445460
Large								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Total								
2006-07	1675127	572310	1102817	25732	16811	1650	1086	1813875
2007-08	1933922	609097	1324825	28994	19862	1818	1246	2027213
2008-09	2332079	648341	1683738	34170	24670	2032	1467	2430658

2. Individual Pulse Crops in Non-NFSM Allahabad District

I. Urd:

Urd was also an important pulse crop of kharif season of Allahabad district. Urd was not sown by marginal and small sample farmers during the study period (2006-07 to 2008-09), while it was grown by medium and large sample farmers during study period, out of total sample 50 farmers only 38.00 per cent sample farmers had cultivated urd on their land during of 2006-07 to 2008-09.

Table-IV-4
Profitability of Pulses Farming in Non NFSM District Allahabad:
Pulse Crop-Urd

								(Rs)
Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Small								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Medium								
2006-07	190440	103305	87135	6989	3197	1967	899	177027
2007-08	153986	87985	66001	6999	3000	2040	874	149065
2008-09	180690	110855	69835	7156	2765	988	842	179161
Large								
2006-07	32470	4500	27970	16235	13985	1910	1645	33000
2007-08	19845	9520	10325	6615	3442	2025	1058	20100
2008-09	20546	14150	6396	6849	2132	2065	643	21050
Total								
2006-07	222910	107805	115105	7621	3952	1957	1011	210027
2007-08	173831	97505	76326	6935	3053	2028	891	169165
2008-09	201236	125006	76141	7123	2695	2167	820	200211

Of the total cultivated land, this crop accounted for 7.45 per cent area in 2008-09. Urd accounted for 17.68 per cent of total area of pulses in 2008-09. The economics of this crop was worked out in table-IV-4. This table shows that net return per hectare and net return per qtl have decreased to Rs. 2,695 and Rs. 820 in 2008-09 from Rs. 3,552 and Rs. 1,101 in 2006-07 on the sample farms respectively. This was due to decrease in productivity and increase in paid costs in 2008-09. The net return per hectare and net return per qtl have also decreased during corresponding period on

medium and large sample farms. The gross return has decreased while the paid out cost has increased in 2008-09 over 2006-07. It may be concluded with this result that urd was not profitable crop in 2008-09 on the sample farms.

II. Arhar

Arhar is also prominent pulse crop of the district, out of total sample 50 farmers, only 18 sample farmers had devoted 6.20 per cent area of GCA in this crop during study period. The small and medium sample farmers had sown this crop in larger area while marginal sample farmers did not sow this crop during the study period. Since, this is a very risky-crop, therefore, the farmers do not sow this crop on large area. It is generally sown in a upland because it does not survive in low laying area. Year-wise profitability of this crop has been worked out in table-IV-5. Table-IV-5 shows that net return per qtl was Rs. 1883 in 2006-07 which went upto Rs. 2357 per qtls in 2008-09, showing 25.17 per cent increase over the period. It has been increasing trend during the study period. The return per hectare was also increasing year by year. The main reason for increasing trend in net return per hectare and per qtl was due to sharp increase in the price of arhar during 2008-09. It is also noticed from this table that the production and average yield have been continuously increasing from 2006-07 to 2008-09 while paid out costs per hectare and per qtl have increased marginally during the study period. Table-IV-5 also reveals that return per hectare and per qtl were higher on the medium size of farms than that of small size of farms during the study periods. Table-IV-5 also shows that gross return, paid out costs and net return per hectare and per qtl were in increasing trend from 2006-07 to 2008-09 on the sample farms. This was because of increase in its productivity and sharp rise in price in subsequent years.

Table-IV-5
Profitability of Pulses Farming in Non NFSM District Allahabad:
Pulse Crop-Arhar

								(Rs)
Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Small								
2006-07	39350	9006	30344	16745	12912	2198	1695	33200
2007-08	25900	7795	18105	11021	7704	2590	1811	20100
2008-09	27775	7050	20725	17359	12953	3408	2543	19600
Medium								
2006-07	398400	80120	318280	17026	13602	2386	1906	352960
2007-08	400290	96950	303340	15455	11712	2518	1908	357960
2008-09	432200	87182	345018	14735	15754	2490	2348	391345
Large								
Prod. 2006-07	1200	700	500	1200	700	2400	1400	-
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Total								
2006-07	438950	82626	349124	16409	13051	2368	1883	386160
2007-08	426190	104745	321445	15086	11379	2522	1902	378060
2008-09	459975	94232	365743	19573	15564	2965	2357	410945

III. Masoor

Masoor is one of most important rabi pulses in Allahabad district. It is mostly consumed by all categories of farmers of this district. Out of total sample farmers all had devoted 22.75 per cent of GCA under this crop in 2008-09. It is also very profitable pulse crop in this district. The profitability of this crop has been worked out in table-IV-6. Table-IV-6 shows that area under masoor crop has been increasing continuously from 2006-07 to 2008-09. The production has also increased in 2008-09. The average yield of masoor has also increased in 2008-09 as compared to 2007-09. On account of this, the gross return per hectare which was Rs. 22,014 in 2006-07 has increased to Rs. 33,411 in 2008-09. In the same manner, the net return per hectare has increased from Rs. 16,697 in 2006-07 to Rs. 26,299 in 2008-09. Table-IV-6 also indicates that net return per hectare and per qtl have been increasing continuously from 2006-07 to 2008-09. It is also

noticed from Table-IV-6 that paid out costs per hectare and per qtl have been increasing continuously from 2006-07 to 2008-09. Even though, the profitability of this crop was significant across the size groups of farms. The net return per hectare and per qtl were estimated at Rs. 26,299 and Rs.2,022 in 2008-09 on the sample farms which were more than 57.51 per cent and 19.01 per cent of estimated return of Rs. 16,697 and Rs. 1,699 in 2006-07 respectively. Analysis of returns of different land holding size groups revealed that there was no vast difference on per qtl return during the study period. It reflects that this was very promising pulse crop on different land holding size groups.

Table-IV-6
Profitability of Pulses Farming in Non NFSM District Allahabad:
Pulse Crop-Masoor

(Rs.)								
Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	55140	14650	40490	23168	17013	2255	1656	47107
2007-08	55585	15955	39630	23653	16748	2360	1683	45348
2008-09	51284	19773	31511	21823	13408	2363	1452	43595
Small								
2006-07	117630	20990	96640	30162	24779	2262	1858	111825
2007-08	100420	24505	75915	32394	24488	2363	1786	91150
2008-09	173400	31140	142260	37290	30594	2513	2061	170500
Medium								
2006-07	1409422	343190	1066232	21387	16180	2242	1696	1301315
2007-08	2230319	448530	1781789	30657	24492	2433	1943	2227828
2008-09	2506900	528400	1978500	33292	26275	2581	2037	2506995
Large								
2006-07	50800	15560	35240	25400	17620	2190	1519	51700
2007-08	89535	16250	73285	35814	29314	2350	1923	93750
2008-09	151750	34400	117350	37938	29338	2500	1933	160500
Total								
2006-07	1632992	394390	1238602	22014	16697	2241	1699	1511947
2007-08	2475859	505240	1970619	30679	24419	2425	1930	2458076
2008-09	2883334	613713	2269621	33411	26299	2569	2022	2881590

I. Gram:

Gram is also a rabi pulse crop which is less important than masoor crop. It occupied only 5.73 per cent area to GCA in 2008-09. The area under this crop was more or less stagnant during the study period. The marginal sample farmers have not sown this crop during the reference year. Of the total sample farmers, only 21 sample farmers had allotted 5.73 per cent of GCA under this crop in 2008-09. The net return per hectare and per qtl have been worked out in table-IV-7.

Table- IV-7
Profitability of Pulses Farming in Non NFSM District Allahabad:
Pulse Crop-Gram

(Rs.)								
Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Small								
2006-07	68670	14990	53680	36142	28253	1962	1534	67600
2007-08	44540	16330	28210	21210	13433	2121	1343	39240
2008-09	20870	12065	8805	16054	6773	2174	917	17370
Medium								
2006-07	492925	198230	294695	17636	10544	2094	1252	469865
2007-08	412558	151910	260975	19071	12054	2178	1377	387915
2008-09	331540	163987	167553	17295	8740	2372	1199	307035
Large								
2006-07	24650	22150	2500	6163	625	2054	208	24200
2007-08	15415	13400	2015	6166	806	2156	282	14300
2008-09	9150	8075	1075	7320	860	2288	269	8100
Total								
2006-07	586245	235370	350875	17319	10366	2076	1243	561665
2007-08	472513	181640	290873	18000	11081	2170	1336	441455
2008-09	361560	184127	177433	16646	8169	2357	1157	332505

Table-IV-7 shows that the return per hectare and per qtl have been continuously decreasing from 2006-07 to 2008-09 on the small and medium size of sample farms while it was found reverse on the large size of sample farms during the corresponding period. The reason for decreased in

return per hectare and per qtl was due to decrease in its productivity. At the aggregate level, table-IV-7 shows that per hectare return was Rs. 10,366 in 2006-07 which has decreased to Rs. 8,169 in 2008-09, while the net return per qtl was Rs. 1,243 in 2006-07 which has also decreased to Rs. 1157 in 2008-09. It shows that productivity of this crop on the sample farms was decreasing year by year. It may be concluded that gram was not profitable crop on the sample farms of Allahabad district during the study period.

4. Total Pulses Sector in NFSM and Non- NFSM Districts

1. Total pulses Sector in NFSM Lalitpur district

Pulses are purely grown in this district. Since this is a rainfed district, therefore, the farmers of this district allocate maximum area under pulse crops. Pulse crops accounted for 74.68 per cent of GCA of the selected farmers of this district Table-IV.8 shows that area as well as productivity of pulse crops on the selected farms have registered a positive growth rate during the study period (2006-07 to 2008-09). Table-IV-8 also reveals that almost all the marginal, small and medium size of the selected farmers were growing at least one pulse crop on their land in each year to fulfill their consumption need of pulses. It is also noticed from table-IV-8 that over all gross and net return per hectare of pulses have increased from Rs. 21,490 in 2006-07 to Rs. 28,135 in 2008-09 and Rs. 14,564 in 2006-07 to Rs. 20,795 in 2008-09 respectively. Table-IV-8 indicates that gross return and paid out costs have been continuously increasing from 2006-07 to 2008-09.

Table- IV-8
Profitability of total Pulses Farming in NFSM District Lalitpur

(Rs.)

Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	220770	70694	150076	23486	15966	1696	1153	251680
2007-08	258518	78087	180431	24739	17266	1886	1310	248768
2008-09	297193	82599	214594	27905	20150	1908	1378	297570
Small								
2006-07	1143647	402525	741122	21139	13699	1810	1173	1133490
2007-08	1366733	391472	975261	24986	17829	1993	1422	1373658
2008-09	1612974	437244	1175730	28932	21089	2492	1816	1644248
Medium								
2006-07	2212555	679585	1532970	21492	14890	1791	1241	2340515
2007-08	2519460	744330	1775130	24485	17251	1966	1385	2567855
2008-09	2894938	797930	2097008	28025	20300	2210	1601	2949950
Large								
2006-07	-	-	-	-	-	-	-	-
2007-08	-	-	-	-	-	-	-	-
2008-09	-	-	-	-	-	-	-	-
Total								
2006-07	3576972	1152804	2424168	21490	14564	1791	1214	3725685
2007-08	4144711	1213889	2930822	24664	17440	1969	1392	4190281
2008-09	4805105	1317773	3487332	28315	20795	2274	1651	4891768

As far as gross and net return per qtl of pulses on the selected farms is concerned, table- IV-8 shows that both have shown upward trend during the study period. The gross return per qtl was estimated at Rs. 1,791 during 2006-07 which has gone up Rs. 2,274 during 2008-09 showing 26.97 per cent increasing over the period. The net return per qtl has also increased to Rs. 1651 from Rs 1214 on the selected farms during the same period. This has happened due to sharp rise in prices of different pulses and significant increase in the productivity of pulses. These two variables had attributed to increase area under pulses during the study period.

II. Total Pulses Sector in Non-NFSM Allahabad district

It has been already mentioned that masoor followed by gram were main pulse crops of rabi season on the sample farms, while urd and arhar were main kharif pulses on the sample farms. However, the area under pulses of rabi season had occupied 28.48 per cent of GCA against 13.64 per cent of kharif pulses. It indicates that sample farmers of different size group of holding had

allocated more area under rabi pulses than that of kharif pulses during of the study period. Among the pulses, masoor was main pulse on the sample farms of different size groups of holding during 2006-07 to 2008-09. The area under total pulses on different size of holdings witnessed a decreasing trend from 2006-07 to 2008-09. The per hectare production of total pulses on marginal and sample farms also witnessed decreasing trend during the study period, while it was in increasing trend on medium and large sample farmers during the same period. The profitability of total pulses on the sample farms of Non-NFSM district Allahabad is presented in Table-IV-9. Table-IV-9 shows that gross and net returns per hectare were estimated at Rs. 17,564 and Rs. 12,520 in 2006-07 which has increased to Rs 24,448 and Rs. 18,082 in 2008-09 respectively. The gross and net return per qtl was Rs. 2,199 and Rs 1,568 in 2006-07 which has gone up to Rs. 2,563 and Rs. 1,896 in 2008-09 respectively. These were also continuously increasing year by year. It is also noticed from table-IV-9 that the increase in net return per hectare and per qtl was only witnessed on the large size of sample farms while it was decreased on marginal sample size of farms during the study period.

Table-IV-9
Profitability of total Pulses Farming in Non-NFSM District Allahabad

(In Rs./ Per Farm Per Ha. / Per Qty.)

Groups	Gross Return Per Farm	Total paid out costs Per Farm	Net Returns Per Farm	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus Per Farm
Marginal								
2006-07	55140	14650	40490	23168	17013	2255	1656	41107
2007-08	55585	15955	39630	23653	16748	2360	1683	45348
2008-09	51284	19773	31511	21823	13408	2363	1452	43595
Small								
2006-07	225650	44986	180664	27687	22167	2151	1722	212625
2007-08	170860	48630	122230	22630	16189	2225	1663	150490
2008-09	222045	50255	171790	29410	22154	2560	1980	207470
Medium								
2006-07	2491187	724845	1766342	17240	12224	2209	1566	2301167
2007-08	3197480	785375	2412105	22470	16951	2384	1798	3122768
2008-09	3451330	890424	2560906	24370	18083	2574	1910	3384536
Large								
2006-07	109120	42910	66210	12124	7357	2071	1256	108900
2007-08	124795	39170	85625	15599	10703	2267	1555	128150
2008-09	181446	56625	124821	21993	15130	2431	1672	189650
Over all average								
2006-07	720274	206848	513427	17564	12520	2199	1568	665950
2007-08	887180	222283	664898	22152	16602	2376	1781	871689
2008-09	976526	254269	722257	24448	18082	2563	1896	956313

III- Comparative Analysis between NFSM district Lalitpur and Non-NFSM district Allahabad

The return per hectare of total pulses was worked out at Rs. 20,794 in 2008-09 on the sample farms of NFSM district Lalitpur against Rs. 18,082 on the sample farms of Non-NFSM district Allahabad. The return of per qtl was estimated at Rs. 1,651 on the sample farms of NFSM district Lalitpur against Rs. 1,896 per qtl in 2008-09 on the sample farms of Non-NFSM district Allahabad. It reflects that there was vast variation in gross return and net return per hectare and per qtl in pulses cultivation between two selected districts. These differences occurred due to variation in soil texture and agro-climatic condition. However, the farmers of both districts do not allocate reasonable area under pulse crops as compared to cereal crops. Since, the pulses are very uncertain crops, therefore, the farmers of both districts allocate very limited area under pulses. The above analysis shows that sample farmers of Non-NFSM district Allahabad were receiving better net return per qtl from pulses than that of NFSM district Lalitpur while the net return per hectare of pulses was higher on the sample farms of NFSM district Lalitpur than that of Non- NFSM district Allahabad. It was due to variation in productivity of pulses.

5. Other major Crops in NFSM and Non-NFSM districts Individually

I- Other major crops in NFSM –Lalitpur district

1- Ground Nut

Groundnut is a kharif season oilseed crop of this district. The soil and climate are very much suitable for its better production in this district. All categories of sample farmers had allocated area under this crop. Out of GCA of sample farms, this crop accounted for 3.20 per cent area in 2008-09. The area under this crop was more or less stagnant during the study period on the selected farms. The profitability of ground-nut on the sample farms in NFSM district Lalitpur was worked out in table-IV-10. The table-IV-10 shows that the gross return per hectare was Rs. 9,589 during 2006-07 which has increased to Rs. 11,710 during 2008-09, while net return per qtl was Rs 316 during 2006-07 which has increased to Rs. 432 per qtl 2008-09. The return per hectare was Rs. 1,888 which has gone up to Rs. 2,537 during 2008-09. This analysis reveals that profitability of this crop was found better across the sample size of farms during 2006-07 to 2008-09. The return per hectare and per qtl was also continuously increasing during the study

period. On account of this, the sample farmers of this district had devoted larger area under this crop. This was also a commercial oil seed crop of kharif season of this district. The soil and climatic condition are very much suitable for this crop. There is no substitution of this crop.

Table-IV-10
Profitability of G-Nut Farming in NFSM District Lalitpur

								(Rs.)
Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	5760	4775	985	9600	1642	1600	274	3400
2007-08	3385	2850	535	11283	1783	1850	292	1900
2008-09	3800	3200	600	12667	2000	2000	316	2000
Small								
2006-07	43780	35020	8760	9601	1921	1606	321	39556
2007-08	47100	36960	10140	11161	2403	1845	397	41795
2008-09	50900	39890	11010	11674	2525	1989	430	42000
Medium								
2006-07	5020	4025	995	9472	1877	1609	319	3410
2007-08	46200	35545	10745	11021	2558	1709	397	43700
2008-09	49050	38180	10870	11679	2588	2000	442	40000
Large								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Total								
2006-07	54560	43820	10740	9589	1888	1606	316	46366
2007-08	96775	75355	21420	11098	2456	1777	393	87395
2008-09	103750	81270	22480	11710	2537	1995	432	84000

II. Maize

Maize is also a kharif season crop in this district. It is not widely cultivated by the farmers of the district. It was sown only in few blocks of this district. The soil and climate were not much suitable for this crop. Out of GCA, it was accounted for 1.74 per cent area under this crop on the

sample farms. The profitability of Maize on the sample farm of NFSM district Lalitpur was worked out in Table- IV-11.

Table-IV-11

Profitability of Maize Farming in NFSM District Lalitpur

(Rs.)

Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Small								
2006-07	13800	10275	3525	6732	1720	538	137	7350
2007-08	13600	10425	3175	6476	1512	562	131	12000
2008-09	12962	10610	2352	6475	1200	584	108	10205
Medium								
2006-07	14225	10770	3455	6774	1645	542	132	8410
2007-08	13550	10295	3255	6775	1627	567	136	11990
2008-09	13126	10980	2146	6563	1073	590	96	11410
Large								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Total								
2006-07	28025	21045	6980	6753	1682	540	134	15760
2007-08	27150	20720	6430	6622	1568	564	134	23990
2008-09	26088	21590	4498	6588	1136	593	102	21615

Table- IV-11 shows that only small and medium sample farmers had sown this crop on their cultivated land during 2006-07 to 2008-09. The marginal sample farmers did not grow this crop during the study period. The net return per hectare and per qtl were decreasing from 2006-07 to

2008-09. This was also not profitable crop on the sample farms during the study period. The net return per hectare and per qtl was worked out to Rs. 1,682 and Rs. 134 in 2006-07 which has reduced to Rs 1,136 and Rs. 102 respectively in 2008-09.

III. Wheat

Wheat is prominent crop of this district. It is a cereal crop which was sown by the all categories of sample farmers. This crop occupied 20.83 per cent, 20.33 per cent, 21.00 per cent area of GCA during 2006-07, 2007-08 and 2008-09 respectively. The productivity of this crop was estimated at 17.99 qtls, 17.58 qtls and 17.51 qtls during 2006-07, 2007-08 and 2008-09 respectively. It shows that area under wheat and production per qtl have been decreasing from 2006-07 to 2008-09 on the sample farms of this district. Since, the unirrigated land has been converting into irrigated land, therefore, area under pea has been increasing simultaneously. The cropping pattern has been diverting in favour of pea. The farmers return on wheat cultivation is presented in table- IV-12. Table-IV-12 shows that the gross and net return per hectare was Rs. 17,603 and Rs. 7,022 in 2006-07, which has increased to Rs. 20,570 and Rs. 8,890 in 2008-09 respectively. In the same manner, the gross and net return per qtl have also increased by 20.24 per cent, 30.26 per cent in 2008-09 over the return in 2006-07 respectively. The per hectare paid out costs has also increased to Rs. 11,692 in 2008-09 over the paid costs of Rs. 10,580 in 2006-07, showing 10.51 per cent increase over the period. It is also evident from table-IV.12 that the net return per hectare and qtl have been in increasing trend during the study period.

Table- IV-12
Profitability of Wheat Farming in NFSM District Lalitpur

(Rs.)

Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	50150	28735	21415	18236	7787	999	427	24150
2007-08	40300	20310	18990	19190	9043	1061	500	9000
2008-09	21190	12005	9185	20181	8748	1170	507	9000
Small								
2006-07	372768	229734	143034	17162	6586	953	366	162000
2007-08	410320	229420	180900	19023	8386	1110	489	171000
2008-09	422242	241429	180813	20527	8790	1207	517	178200
Medium								
2006-07	416200	245890	170310	17940	7341	999	409	161500
2007-08	441375	239550	201825	19025	8699	1061	485	180000
2008-09	477487	269470	208017	20626	8986	1149	501	198400
Large								
2006-07	--	--	--	--	--	--	--	--
2007-08	--	--	--	--	--	--	--	--
2008-09	--	--	--	--	--	--	--	--
Total								
2006-07	839118	504359	334759	17603	7022	978	390	347650
2007-08	891995	490280	401715	19031	8570	1083	488	360000
2008-09	920919	522904	398015	20570	8890	1176	508	385600

6. Other major Crops in Non-NFSM district Allahabad

I. Paddy:

Paddy is most important cereal crop of kharif season of the district. It is mostly cultivated by all types of farmers to meet consumption need of their family. All the sample farmers have sown this crop in 103.98 hectares in 2006-07 which has decreased to 86.18 hectares in 2008-09. The area and production have declined in 2008-09 on the sample farms as compared to area and production in 2006-07.

Table- IV-13
Profitability of Paddy Farming in Non-NFSM District Allahabad

(Rs.)

Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	22650	5574	17076	35952	27104	1192	899	20740
2007-08	25220	6098	19122	40032	30352	1261	956	24390
2008-09	25960	6221	19739	41206	31332	1298	987	25688
Small								
2006-07	202250	53551	148699	38524	28324	1225	901	213900
2007-08	158900	55000	103900	39725	25935	1241	812	161820
2008-09	193750	51782	141968	40789	29888	1266	928	194600
Medium								
2006-07	3467080	950488	2516592	38502	27947	1284	932	3599100
2007-08	3338570	848129	2490441	42021	31346	1313	980	3426300
2008-09	3211360	822800	2388560	42933	31933	1363	1014	3160300
Large								
2006-07	268400	90840	177560	33550	22195	1118	740	311625
2007-08	236350	81725	154625	33764	22089	1164	762	266950
2008-09	217660	71400	146260	36277	24377	1170	786	239700
Total								
2006-07	3960380	1100453	2859927	38088	27505	1267	915	4145365
2007-08	3759040	990952	2768088	41272	30392	1299	955	3879460
2008-09	3648730	952203	2696527	42338	31289	1336	987	3620288

The average yield was also low in 2008-09. Table- IV-13 shows that gross and net return per hectare of paddy have increased from Rs. 38,088 to Rs. 42,338 and Rs. 27,505 to Rs. 31,289 in 2008-09 over 2006-07 respectively. The gross return per qtl was worked out to Rs. 1,267 in 2006-07 which has increased to Rs. 1,336 in 2008-09, while net return per qtl was Rs. 915 in 2006-07, which has marginally increased to Rs. 987 per qtl in 2008-09. It shows that paddy was remunerative crop on the sample farms. There was no substitute of this crop in kharif season. All irrigated land of sample farmers was covered under this crop. It is also witnessed from Table- IV.13 that the net return per hectare and per qtl have been in increasing trend during the study period from 2006-07 to 2008-09.

II. Bajra:

Bajra is also an important kharif season crop of Allahabad district. It is mostly grown in unirrigated land. This crop was grown by the selected small, medium and large farmers on an

average 10.02 per cent of GCA during the study period. All the sample farmers were growing bajra in 33.60 hectares in 2006-07 which has increased to 38.00 hectares in 2008-09. The area and production of bajra on the sample farms have increased in 2008-09 than that of area and production of 2006-07. Table-IV-15 shows that gross as well as net return per hectare have been continuously increasing from 2006-07 to 2008-09. Table- IV-14 also shows that gross and net return per qtl were Rs. 537 and Rs. 123 in 2006-07 which have increased to Rs. 576 and Rs. 133 in 2008-09 respectively. This was also profitable crop on the sample farms during the study period. There was no substitute of this crop. It also requires very less cost of production. Hence, it was preferred by all categories of farmers of this district. The urd/ moong is also grown with bajra in most parts of the district.

Table- IV-14
Profitability of Bajra Farming in Non-NFSM District Allahabad

(Rs.)								
Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	--	-	-	-	-	-	-	-
2007-08	-	-	-	-	-	-	-	-
2008-09	-	-	-	-	-	-	-	-
Small								
2006-07	4900	3800	1100	3920	880	544	122	5000
2007-08	12056	8000	4056	4822	1622	567	191	12400
2008-09	7790	4300	3490	5193	2327	577	259	7660
Medium								
2006-07	145472	112295	33177	4793	1093	533	121	172800
2007-08	164633	136485	28148	4885	835	543	93	191750
2008-09	187901	146625	41276	5446	1196	573	126	213900
Large								
2006-07	10320	7700	2620	5160	1310	607	154	11280
2007-08	11050	8300	2750	5525	1375	614	153	11815
2008-09	11370	8400	2970	5685	1485	632	165	12070
Total								
2006-07	160692	123795	36897	4783	1098	1537	123	189080
2007-08	187739	152785	34954	4915	915	548	102	215965
2008-09	207061	159325	47736	5449	1256	576	133	233630

III- Til (Sesamum)

Til is an oilseed crop of kharif season. It is very valuable crop. It is also grown in unirrigated land. It is sown in a very limited area being of very tender crop. It was sown on average area of 3.99 per cent of GCA in 2008-09. Therefore, til was sown only in 16.35 hectares and 15.15 hectares in 2006-07 and 2008-09 respectively. There was no much fluctuation in area under this crop during the study period. Even then, the return per hectare was very high as compared with other complete crops of kharif season.

Table- IV.15
Profitability of Til in Non-NFSM District Allahabad

(Rs.)								
Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	6000	2620	3380	12000	6760	3000	1690	5400
2007-08	-	-	-	-	-	-	-	-
2008-09	-	-	-	-	-	-	-	-
Small								
2006-07	11400	5640	5760	12000	6063	3000	1516	12250
2007-08	-	-	-	-	-	-	-	-
2008-09	-	-	-	-	-	-	-	-
Medium								
2006-07	146020	82546	63474	9800	4260	2800	1217	180000
2007-08	161310	88296	73014	11400	5160	2850	1290	192780
2008-09	157800	79426	78374	12000	5960	3000	1490	179000
Large								
2006-07	-	-	-	-	-	-	-	-
2007-08	12000	5240	6760	12000	6760	3000	1690	12250
2008-09	24000	10980	13020	12000	6510	3000	1628	24150
Total								
2006-07	163420	90806	72614	9995	4441	2820	1253	197650
2007-08	173310	93536	79774	11440	5266	2860	1316	205030
2008-09	181800	90406	91394	12000	6033	3000	1508	203150

The gross and net return per hectare was estimated at Rs. 12,000 and Rs. 6,033 in 2008-09 respectively. The gross and net return per qtl were Rs. 3,000 and Rs. 1,508 in 2008-09 respectively. The profitability of this crop was increasing year by year on the selected farms. The reason for its high profitability of this crop was due to very much hike in its price during the study period.

IV. Wheat:

The profitability of wheat on the sample farms of Non-NFSM district Allahabad is presented in Table- IV-16. Table-IV-16 shows that none of the marginal sample farmers had sown wheat on his land during the reference year. The wheat was most important crop on the other categories of sample farms. Of the total GCA, wheat accounted for 21.00 per cent area during the study period. The area under this crop has been increasing from 2006-07 to 2008-09 across different size of the sample farms but pace of growth was very low. The pace of growth in productivity was high across the size of sample farms. The net return per hectare was worked out to Rs. 12,298 in 2006-07 which has marginally increased to Rs. 12,408 in 2008-09 (Table- IV-16). The trend of growth in net return per hectare was also witnessed positive across the size of farms from 2006-07 to 2008-09. As far as the net return per qtl is concerned, Table-IV-16 shows that the net return per qtl was Rs. 437 in 2006-07 which has increased to Rs. 440 in 2008-09. Against this, paid out cost was estimated at Rs. 11,942 per hectare and Rs. 423 per qtl in 2008-09, which were 10,980 per hectare and Rs. 390 per qtl in 2006-07. It may be concluded with this result that wheat was profitable crop on the sample farms. On account of this, the area under this crop has been increasing from 2006-07 to 2008-09 across the sample size of farms.

Table- IV-16
Profitability of Wheat Farming in Non-NFSM District Allahabad

(Rs.)

Groups	Gross Return	Total paid out costs	Net Returns	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus
Marginal								
2006-07	-	-	-	-	-	-	-	-
2007-08	-	-	-	-	-	-	-	-
2008-09	-	-	-	-	-	-	-	-
Small								
2006-07	58550	23473	35077	23897	14317	825	494	57000
2007-08	81420	34822	46598	25052	14338	895	512	81600
2008-09	97000	39178	57822	28116	16760	970	578	89250
Medium								
2006-07	1502300	715823	786477	23006	12044	821	430	1607400
2007-08	1551490	759375	792115	22985	11735	901	460	1648200
2008-09	1843200	827299	1015901	26624	14674	951	524	1892800
Large								
2006-07	155920	70500	85420	25987	14237	896	491	159200
2007-08	197450	82950	114500	28207	16357	940	545	190550
2008-09	205100	85050	120050	29300	17150	977	572	201400
Total								
2006-07	1716770	809796	906974	23278	12298	827	437	1823600
2007-08	1830360	877147	953213	23542	12260	905	471	1920350
2008-09	1940200	951527	988673	24350	12408	863	440	2183450

7. Total of Major Crops in NFSM and Non-NFSM districts

I. Total of Major Crops in NFSM: Lalitpur district

Lalitpur is rainfed district of Bundelkhand region of U.P. Therefore, limited crops are grown in this district. This is a pulse growing district of U.P. Three other majors crops namely groundnut, maize and wheat are grown by the sample farmers of this district. Out of GCA, the other major crops accounted for 25.32 per cent during the study period. The wheat accounted for 21.00 per

cent of GCA during the same period. Of the total area under other major crops, wheat accounted for 77.72 per cent followed by 22.28 per cent of groundnut and maize during the study period.

Table-IV-17
Profitability of Total Major Crops Farming in NFSM District Lalitpur

(In Rs./Per Farm Per Ha. / Per Qty.)

Groups	Gross Return Per Farm	Total paid out costs Per Farm	Net Returns Per Farm	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus Per Farm
Marginal								
2006-07	55910	33510	22400	16690	6687	1039	416	27550
2007-08	43685	24160	19525	18202	8135	1097	490	10900
2008-09	24990	15205	9785	19223	7527	1249	489	11000
Small								
2006-07	430348	275029	155319	15191	5482	969.55	350	208906
2007-08	471020	276805	194215	16828	6939	1078	444	224795
2008-09	486104	291929	194175	18077	7221	1166	466	230405
Medium								
2006-07	435445	260685	174760	16858	6766	977	392	173320
2007-08	501215	285390	215825	17048	7341	1078	464	235690
2008-09	539663	318630	221033	18387	7531	1167	478	249810
Large								
2006-07	-	-	-	-	-	-	-	-
2007-08	-	-	-	-	-	-	-	-
2008-09	-	-	-	-	-	-	-	-
Over all Average								
2006-07	230426	142306	88120	16027	6129	977	374	102444
2007-08	253980	146589	107391	16991	7185	1079	456	117846
2008-09	362689	156441	106248	18261	7386	1168	473	123804

It has already been mentioned that groundnut and wheat were profitable crops on the sample farmers during the study period, while maize was not found remunerative on the sample farms during the same period. Table- IV-17 shows that return per hectare of total major crops was Rs. 16,027 during 2006-07 which has gone up to Rs 18,261 thereby showing 13.94 per cent increase over the period. The net return per qtl of total major crops was worked out to Rs. 977 during

2006-07 which has increased to Rs. 1,168 during 2008-09, showing 19.55 per cent increase over the period. The paid out costs has also increased during 2008-09 as compared to paid out costs during 2006-07. Analysis on return of different land holding size groups of farmers revealed that maximum return per qtl occurred on marginal and small farms. The return per hectare was worked out to Rs. 6,129 in 2006-07 which has increased to Rs. 7,386 in 2008-09 showing 20.51 per cent increase over the period. The above analysis reflects that the total major crops were much profitable on the sample farms during the study period.

II. Total of major Crops in Non-NFSM Allahabad district

Paddy, bajra, til and wheat were major crops grown by the sample farms of Non-NFSM Allahabad district during the study period. Of the GCA, the major crops accounted for 57.74 per cent area during the reference year. Of the GCA of 379.28 hectares, paddy accounted for 22.72 per cent followed by 21.00 per cent and 14.00 per cent of wheat and other major crops respectively during the study period. Out of GCA, wheat and rice had jointly occupied 43.72 per cent area against 42.12 per cent of pulses during the study period (2008-09). Table- IV-18 reveals that area under major crops has been decreasing trend on the marginal small and medium sample farms while it was more or less stagnant on the large sample size of farms from 2006-07 to 2008-09. However, the production of these crops has increased from 2006-07 to 2008-09 on small, medium and large sample size of farms, while it was opposite in case of marginal sample size of farms. The gross return per hectare of these crops was Rs. 26,467 in 2006-07 which has increased to Rs. 27,774 in 2008-09. The net return per hectare and per qtl of total major crops was worked out to Rs. 17,127 and Rs. 701 in 2006-07 which have increased to Rs. 17,942 and Rs. 730 in 2008-09 respectively. It reflects that returns of these crops were positive across the sample size of farms during the study period.

Table-IV-18
Profitability of Total Major Crops in Non-NFSM District Allahabad
(In Rs./Per Farm Per Ha. / Per Qty.)

Groups	Gross Return Per Farm	Total paid out costs Per Farm	Net Returns Per Farm	Gross Return Per Ha	Net Return Per Ha	Gross Return Per Qtl	Net Return Per Qtl	Value of marketed Surplus Per Farm
Marginal								
2006-07	28650	8194	20456	25354	18103	1364	974	26140
2007-08	25220	6098	19122	40032	30352	1261	956	24390
2008-09	25960	6221	19739	41206	31332	1298	987	25688
Small								
2006-07	277100	86464	190636	27990	19256	1114	766	288150
2007-08	252376	97822	154554	25885	15852	1050	643	244620
2008-09	298540	95260	203280	30777	20957	1120	763	291510
Medium								
2006-07	5260872	1861157	3399715	26232	16952	1083	700	5559300
2007-08	5216003	1832285	3383718	26776	17370	1128	732	5459030
2008-09	5300261	1876150	3424111	27652	17864	1134	733	5446000
Large								
2006-07	454640	169040	285600	28415	16600	1055	663	482105
2007-08	456850	178215	278635	26874	16390	1050	641	481565
2008-09	458130	175830	282300	26949	16606	1086	669	477320
Over all Average								
2006-07	150531	531214	974102	26467	17127	1084	701	1588924
2007-08	1487612	528605	959007	26782	17265	1119	721	155240
2008-09	1520723	538365	982357	27774	17942	1130	730	1560129

8. Comparative Analysis of Profitability of Pulses Sector Vis-à-vis other total Major Crops:

I. Comparative Analysis of Profitability in NFSM: Lalitpur District

Table-IV.19 shows that the returns on pulses were much higher than the returns on the total major crops in different study periods and also across the size of sample farms.

Table-IV-19
Profitability of Total Pulses and Major Crops Farming in NFSM District Lalitpur:
(In Rs./Per Farm Per Ha. / Per Qty.)

Groups	Total Pulses				Total Major Crops			
	Gross Return per hectare	Net Returns per hectare	Gross Return Per Qtls	Net Return Per Qtls.	Gross Return per hectare	Net Returns per hectare	Gross Return Per Qtls	Net Return Per Qtls.
Marginal								
2006-07	23486	15966	1696	1153	16690	6687	1039	416
2007-08	24739	17266	1886	1310	18202	8135	1097	490
2008-09	27905	20150	1908	1378	19223	7527	1249	489
Small								
2006-07	21139	13699	1810	1173	15191	5482	969	350
2007-08	24986	17829	1993	1422	16828	6939	1078	444
2008-09	28932	21089	2492	1816	18077	7221	1166	466
Medium								
2006-07	21492	14890	1791	1241	16850	6766	977	392
2007-08	24485	17251	1966	1385	17048	7341	1078	464
2008-09	28025	20300	2210	1601	18387	7531	1167	478
Large								
2006-07	-	-	-	-	-	-	-	-
2007-08	-	-	--	-	-	-	-	-
2008-09	-	-	-	-	-	-	-	-
Total								
2006-07	21490	14564	1791	1214	16027	6129	977	374
2007-08	24664	17440	1969	1392	16991	7185	1078	456
2008-09	28315	20795	2274	1651	18261	7386	1168	473

The net return per hectare of the pulses was much higher by more than double of the total major crops in 2008-09. This pace of increase was also witnessed across the size of farms. The net return per qtl in pulses was about 4 times higher than that of total major crops in corresponding period. The same pace was also witnessed across the sample size of farms. Overall, net return per hectare and per qtl were estimated at Rs. 20,795 and Rs. 1,651 for pulses in 2008-09 against Rs. 7,386 and Rs. 473 for total major crops respectively. Thus, the cultivation of pulses was more profitable on the sample farms as compared to other major crops in NFSM Lalitpur district. But

the area under pulses has not been expanding as expected. The allocation of area under pulses was more or less fixed by the farmers because it is not grown as commercial crop.

Apart from this, the pulses are highly risky crops than the cereal crops. Pulses are also prone to pests and disease and also destroyed by blue-bulls. On account of these major constraints, the farmers do not take much interest to grow the pulses on large areas of their total cultivated land.

II. Comparative Analysis of Profitability in Non-NFSM: Allahabad District

As mentioned earlier that paddy, bajra, til and wheat were grown by the sample farms of Non-NFSM Allahabad district. Of the GCA, these four major crops occupied 57.74 per cent area against 42.12 per cent area of pulses during the reference period. The comparative statement on profitability of pulses vis. a. vis other total major crops is analyzed in Table- IV-20. Overall the net return per hectare of pulses was estimated at Rs. 18,082 in 2008-09 against Rs. 17,942 of total major crop showing 0.78 per cent increase in pulses over total major crops. The net return per qtl of pulses was worked out at Rs. 1896 in 2008-09 against Rs. 730 of total major crops, showing 159.72 per cent increase in pulses over total major crops during 2008-09. Thus, the return per hectare and per qtl were higher in case of pulses than that of total major crops. The gross return per hectare was estimated at Rs. 24,448 in 2008-09 in case of pulses against Rs. 27,774 for total major crops during the same period. It shows that the cost of cultivation was much lower in pulses than other major crops. Overall, the cultivation of pulses was much more profitable across the sample size of farms during the study period (from 2006-07 to 2008-09) than total major crops. This was because of hike in prices in pulses and its lower cost of cultivation than total major crops.

Table- IV-20
Profitability of total Pulses and Major Crops Farming in Non-NFSM District Allahabad:
(Rs.)

Groups	Total Pulses				Total Major Crops			
	Gross Return per hectare	Net Returns per hectare	Gross Return Per Qtls	Net Return Per Qtls.	Gross Return per hectare	Net Returns per hectare	Gross Return Per Qtls	Net Return Per Qtls.
Marginal								
2006-07	23168	17013	2255	1656	25354	18103	1364	974
2007-08	23653	16748	2360	1683	40032	30352	1261	956
2008-09	21823	13408	2363	1452	41206	31332	1298	987
Small								
2006-07	27687	22167	2151	1722	27990	19256	1114	766
2007-08	22630	16189	2225	1663	25885	15852	1050	643
2008-09	29410	22154	2560	1980	30777	20957	1120	763
Medium								
2006-07	17240	12224	2209	1566	26232	16952	1083	700
2007-08	22470	16951	2384	1798	26776	17330	1128	732
2008-09	24370	18083	2574	1910	27652	17864	1134	733
Large								
2006-07	12124	7357	2071	1256	28415	16600	1055	663
2007-08	15599	10703	2267	1555	26874	16390	1050	641
2008-09	21993	15130	2431	1672	26949	16606	1086	669
Overall Average								
2006-07	17564	12520	2199	1568	26467	17127	1084	701
2007-08	22152	16602	2376	1781	26782	17265	1119	721
2008-09	24448	18082	2563	1896	27774	17942	1130	730

CHAPTER -V

TECHNOLOGY ADOPTION, MARKETING AND OTHER ISSUES

This chapter mainly deals with the adoption of technology in respects of the area under improved varieties of pulses in NFSM as well as Non-NFSM districts, knowledge among farmers about improved varieties of pulses, sources of knowledge about improved varieties, recommended practices followed by farmers in pulses, problems with improved varieties of each important pulses in both NFSM and Non- NFSM districts. Solutions for problems of improved varieties suggested by farmers, marketing of pulses through various channels, quantity of each important pulses sold through various channels in NFSM and Non- NFSM districts and procurement of pulses from farmers by the government (NAFED) in both NFSM as well as Non- NFSM districts undertaken in U.P.

Technology Adoption:

V-1. Area Under Improved Varieties of Pulses.

Table-V-1(a) reveals that in NFSM district Lalitpur of U.P. state, 72 per cent of the sample farmers reported area under improved varieties of important pulses on an average. While the individual pulse-wise analysis shows that in cases of urd and pea 100 per cent of sample farmers reported their area under improved varieties but in case of moong only 16 per cent of sample farmers reported their area under improved varieties. Thus, response in this district was better as the area under improved varieties of important pulses undertaken was considerably higher.

Similarly table-V-1(b) reveals that in Non-NFSM district Allahabad of the state of U.P., 71.13 per cent of the sample farmers reported their area under improved varieties of important pulses on an over all average. The pulse-wise analysis shows that in non-NFSM district Allahabad only in case of Masoor 100 per cent of sample farmers reported their area under improved varieties against 38 per cent, 34 per cent and 42 per cent respectively in case of urd, arhar and gram under improved varieties. Thus, in this district the area under improved varieties of important pulses undertaken was discouraging except in case of masoor which indicates clearly that effect of National Food Security Mission (2008) was not as effective as in NFSM district comparatively.

Table-V-1(a)**Farmers Reporting Area under Improved Varieties of Pulses in NFSM District lalitpur
(2008-2009)**

Pulses	No. of Farmers Reporting Area Under Improved Varieties	Total No. of Farmers in the Size Group	% of Reporting I. Vs.
Urd	50	50	100.00
Moong	8	50	16.00
Pea	50	50	100.00
Masoor	--	--	--
Total	108	150	72.00

Table-V-1(b)**Farmers Reporting Area under Improved Varieties of Pulses in Non NFSM District
Allahabad**

Pulses	No. of Farmers Reporting Area Under Improved Varieties	Total No. of Farmers in the Size Group	% of Reporting I. Vs.
Urd	19	50	38.00
Arhar	17	50	34.00
Masoor	50	50	100.00
Gram	21	50	42.00
Total	107	150	71.13

The area under improved varieties of pulses in NFSM district Lalitpur worked-out in table-V-2(a) also shows that on an overall average 100 per cent area was reported under improved varieties as the area under traditional varieties was nil. The pulse-wise analysis also shows that the total area under urd, moong and pea was reported under improved varieties. Masoor was not taken in this district. The valid reason was told as canal irrigation due to which the area was shifted to pea and other competing crops. Thus, response of the National food Security Mission was highly effective in this district.

Table-V-2(b) indicates that in the non-NFSM district Allahabad on an overall average about 98 per cent area was reported under improved varieties. Cultivation of traditional varieties is still practiced in this district. The pulse-wise analysis indicates that except masoor the area under urd, arhar and gram was under improved varieties which shows that improved technology was adopted in cases of some important pulses in non-NFSM district Allahabad.

Table-V-2(a)
Area under Improved Varieties of Pulses in NFSM District Lalitpur
(2008-2009) (Area in acres)

Pulses	Total Area Under the Crop	Area Under Traditional Varieties	Area Under Improved Varieties	% of Area Under Improved Varieties
Urd	93.65	--	93.65	100.00
Moong	7.80	--	7.80	100.00
Pea	68.25	--	68.25	100.00
Masoor	--	--	--	--
Total	169.70	--	169.70	100.00

Table-V-2(b)
Area under Improved Varieties of Pulses in Non NFSM District Allahabad
(Area in acres)

Pulses	Total Area Under the Crop	Area Under Traditional Varieties	Area Under Improved Varieties	% of Area Under Improved Varieties
Urd	28.25	--	28.25	100.00
Arhar	23.50	--	23.50	100.00
Masoor	86.30	2.63	83.67	96.95
Gram	21.72	--	21.72	100.00
Total	159.77	2.63	157.14	98.35

V-2. Knowledge About Improved Varieties of Pulses Among Farmers

Table-V-3(a) reveals that on an over all average 100 per cent of the sample farmers had knowledge about improved varieties of pulses in the NFSM district Lalitpur. There was no large farmer among the sample farmers undertaken in this district. Similarly table-V-3(b) also reveals

that in non-NFSM district Allahabad too on an average 100 per cent of the sample farmers had knowledge about the improved varieties of pulses. In this district the number of medium farmers was highest. Thus, it is evidently clear that farmers of both the districts were well aware about the improved varieties of pulses and as such the National Food Security Mission was found to be effective in both the districts.

Table-V-3(a)

Knowledge about Improved Varieties of Pulses among the Farmers in NFSM District Lalitpur

Size of Farmers	No. of Farmers Aware of Improved Varieties	Total No. of Farmers in the Size Group	% of Farmers Aware of IV
Marginal	8	8	100.00
Small	27	27	100.00
Medium	15	15	100.00
Large	--	--	--
Total	50	50	100.00

Table-V-3(b)

Knowledge about Improved Varieties of Pulses among the Farmers in Non NFSM District Allahabad

Size of Farmers	No. of Farmers Aware of Improved Varieties	Total No. of Farmers in the Size Group	% of Farmers Aware of IV
Marginal	6	6	100.00
Small	6	6	100.00
Medium	37	37	100.00
Large	1	1	100.00
Total	50	50	100.00

As regards the sources of knowledge about improved varieties of pulses among the sample farmers in NFSM district Lalitpur the data worked out in table-V-4(a) indicate that the majority i.e. 36 out of 50 sample farmers reported the extension agents as their source of knowledge about improved varieties and only 12 sample farmers told their neighbours as the source of knowledge

about improved varieties of pulses and the remaining 2 sample farmers had told the other sources of knowledge about the improved varieties of pulses. Thus, main sources of knowledge about the improved varieties of pulses in NFSM district were the extension agents.

Similarly table-V-4(b) reveals that in non-NFSM district Allahabad the majority i.e. 30 out of 50 sample farmers had reported their neighbourers as the main source of knowledge about the improved varieties of pulses. The majority of farmers in this district also were the medium farmers. Thus, in the non-NFSM district Allahabad the National Food Security Mission had not been effective at all. There was no large farmers in this district too. The data are given in table-V-4(a) & table-V-4(b).

Table-V-4(a)

**Sources of Knowledge about Improved Varieties among the Farmers in NFSM District
Lalitpur**

(No. of Farmers)

Size of Farmers	Sources				
	Extension Agents	Neighbours	News Paper / Media	Others	Total
Marginal	2	4	--	2	8
Small	20	7	--	--	27
Medium	14	1	--	--	15
Large	--	--	--	--	--
Total	36	12	--	2	50

Table-V-4(b)

**Sources of Knowledge about Improved Varieties among the Farmers in Non NFSM District
Allahabad**

(No. of Farmers)

Size of Farmers	Sources				
	Extension Agents	Neighbours	News Paper / Media	Others	Total
Marginal	2	4	--	--	6
Small	2	4	--	--	6
Medium	10	22	5	--	37
Large	1	--	--	--	1
Total	15	30	5	--	50

Table-V-5(a) reveals that on an overall 72 per cent of the sample farmers reported extension agents as their source of knowledge about improved varieties against 24 per cent as neighbours to be the main source of knowledge about improved varieties of pulses in NFSM district Lalitpur. The other sources were nominally reported in this district. While table-V-5(b) reveals that in non-NFSM district Allahabad on an over all average the maximum i.e. 60 per cent of the sample farmers had reported the neighbourers as their sources of knowledge, 30 per cent reported extension agents and only 10 per cent of sample farmers reported news papers as their sources of knowledge about improved varieties of pulses. Thus, extension agents, neighbourers and news papers were the main sources of knowledge in both the districts.

Table-V-5(a)

Source-wise Distribution of Knowledge about Improved Varieties among the Farmers in NFSM District Lalitpur

Size of Farmers	Extension Agents	Neighbours	News Paper / Media	Others	Total
Marginal	25	50	--	25	100
Small	74.07	25.93	--	--	100
Medium	93.33	6.64	--	--	100
Large	--	--	--	--	--
Total	72.00	24.00	--	4.00	100

Table-V-5(b)

Source-wise Distribution of Knowledge about Improved Varieties among the Farmers in Non NFSM District Allahabad

(Figures in %)

Size of Farmers	Extension Agent	Neighbours	News Paper / Media	Others	Total
Marginal	33.33	66.67	--	--	100
Small	33.33	66.67	--	--	100
Medium	27.03	59.46	13.51	--	100
Large	100.00	--	--	--	--
Total	30.00	60.00	10.00	--	100

V-3: Recommended Practices Followed

Regarding recommended practices in pulses followed by the sample farmers of NFSM district Lalitpur worked out in table-V-6(a) it was reported that maximum i.e. 44 had followed sowing practices, 28 seed practices, 25 other practices and 12 had not followed any of the recommended practices. Thus, farmers only followed sowing and seed practices in this district. While table-V-6(b) reveals that in non-NFSM district Allahabad almost equal counting about 45 sample farmers on an overall had followed sowing, seed and other practices in this district. Thus, in both the districts only sowing and seed practices were commonly followed which indicates that the recommended practices were followed half heartedly in both NFSM as well as non-NFSM district and as such National Food Security Mission (2008) was ineffective in respects of the recommended practices being followed.

Table-V-6(a)

Recommended Practices in Pulses Followed by Farmers in NFSM District Lalitpur

(No. of Farmers)

Size of Farmers	Followed Some Practice			Not Followed any Practice
	Sowing Practices	Seed Practices	Other	
Marginal	7	5	3	1
Small	24	15	14	3
Medium	13	8	8	2
Large	--	--	--	--
Total	44	28	25	6

Table-V-6(b)

Recommended Practices in Pulses Followed by Farmers in Non NFSM District Allahabad

(No. of Farmers)

Size of Farmers	Followed Some Practice			Not Followed any Practice
	Sowing Practices	Seed Practices	Other	
Marginal	6	4	4	--
Small	5	5	5	1
Medium	34	35	35	3
Large	1	1	1	--
Total	46	45	45	4

Table-V-7(a) reveals that in NFSM district Lalitpur on an over all 88 per cent of sample farmers had followed sowing practices, 56 per cent seed practices, 50 per cent other practices and 12 per cent had not followed any recommended practices. The size-groups analysis shows that in this district more or less the equal number of farmers followed sowing, seed and other recommended practices only. Thus, recommended practices were followed half heartedly in this district.

While table-V-7(b) reveals that in non-NFSM district Allahabad on an overall about 90 per cent of sample farmers had followed sowing seed and other recommended practices and only 8 per cent had not followed any recommended practices in this district. The size-group-wise analysis shows that 100 per cent of the marginal and large farmers followed recommended practices against 83 and 96 per cent of small and medium farmers respectively. Thus, in this district recommended practices were followed in better manner.

Table-V-7(a)

Farmers Following Recommended Practice in Pulses in NFSM District Lalitpur

(Figures in %)

Size of Farmers	Followed Some Practices			Not Followed any Practice
	Sowing Practices	Sees Practices	Other	
Marginal	87.50	62.50	37.50	12.50
Small	88.89	55.56	51.85	11.11
Medium	86.67	53.33	53.33	13.33
Large	--	--	--	--
Total	88.00	56.00	50.00	12.00

Table—V-7(b)

Farmers Following Recommended Practice in Pulses in Non-NFSM District Allahabad

(figures in %)

Size of Farmers	Followed Some Practice			Not Followed any Practice
	Sowing Practices	Sees Practices	Other	
Marginal	100.00	66.67	66.67	--
Small	83.33	83.33	83.33	16.67
Medium	91.89	94.59	94.59	8.11
Large	100.00	100.00	100.00	--
Total	92.00	90.00	90.00	8.00

V-4: Problems with Improved Varieties of Pulses

In case of problems with the seeds of improved varieties of urd table-V-8(a) and table-V-9(a) revealed that in NFSM district Lalitpur the non availability of the seeds of improved varieties was reported as one of the major problems and this problem was ranked 6 by 45 farmers i.e. 90 per cent of the sample farmers and ranked 5 by 5 farmers i.e. 10 per cent of the sample farmers. The untimely availability of seed of I.V. of urd was another problems faced by 40 farmers and ranked 1 by 80 per cent of the sample farmers and ranked 2 by 10 farmers i.e. 20 per cent of the sample farmers. The third problem i.e. seeds were very expensive was faced by 10 farmers and ranked 1 by 20 per cent of sample farmers and faced by 40 farmers and ranked 2 by 80 per cent of sample farmers. The I.V. of urd needed large doses of other inputs was reported as fourth problem faced by 45 farmers and ranked 5 by 90 per cent of the sample farmers and ranked 6 by 5 farmers i.e. 10 per cent by the sample farmers. Much lower yield than expected was the fifth major problem faced by 38 farmers and ranked 3 by 78 per cent of sample farmers and ranked 4 by 12 farmers i.e. 24 per cent of the sample farmers. Inadequate pest resistance was the 6th problem faced by 12 farmers and ranked 3 by 24 per cent of sample farmers and ranked 4 by 38 farmers i.e. 76 per cent of sample farmers.

Table-V-8(a)

Farmers Reporting Problems with Improved Varieties of Urd in NFSM District Lalitpur
(Figures in No.)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	5	45	50
Available but not on time	40	10	--	--	--	--	50
Very expensive	10	40	--	--	--	--	50
Need large doses of other inputs	--	--	--	--	45	5	50
Much lower yield than expected	--	--	38	12	--	--	50
Pest resistance not adequate	--	--	12	38	--	--	50
Total	50	50	50	50	50	50	300

Table-V-9(a)**Distribution of Farmers Reporting Problems with Improved Varieties of Urd in NFSM District Lalitpur**

(Figures in %)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	10	90	100
Available but not on time	80	20	--	--	--	--	100
Very expensive	20	80	--	--	--	--	100
Need large doses of other inputs	--	--	--	--	90	10	100
Much lower yield than expected	--	--	76	24	--	--	100
Pest resistance not adequate	--	--	24	76	--	-	100
Total	16.67	16.67	16.67	16.67	16.66	16.66	100

While table-V-8(b) and table-V-9(b) reveal that in non-NFSM district Allahabad the problem of non-availability of I.V. seeds of urd was faced by 16 farmers and ranked 6 by 84.21 per cent of sample farmers and ranked 5 by 3 farmers i.e. 16 per cent of sample farmers. The untimely availability of I.V. seeds of urd was second problem faced by 14 farmers and ranked 1 by 74 per cent of sample farmers and ranked 2 by 26 per cent of sample farmers. The third problem of I.V. seeds of urd being very expensive was faced by 14 farmers and ranked 2 by 74 per cent of sample farmers and ranked 1 by 26 per cent of sample farmers. The 4th major problem i.e. need of large doses of other inputs was faced by 16 farmers and ranked 5 by 84 per cent of sample farmers and ranked 6 by 16 per cent of the sample farmers. The problem of much lower yield than expected was faced by its 13 farmers and ranked 3 by 68 per cent of the sample farmers and ranked 4 by 32 per cent of the sample farmers. The sixth problem of inadequate pest resistance was faced by 6 farmers and ranked 3 by 32 per cent of sample farmers and ranked 4 by 68 per cent of sample farmers.

Table-V-8(b)**Farmers Reporting Problems with Improved Varieties of Urd in Non NFSM District Allahabad**

(Figures in No.)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	3	16	19
Available but not on time	14	5	--	--	--	--	19
Very expensive	5	14	--	--	--	--	19
Need large doses of other inputs	--	--	--	--	16	3	19
Much lower yield than expected	--	--	13	6	--	--	19
Pest resistance not adequate	--	--	6	13	--	--	19
Total	19	19	19	19	19	19	114

Table-V-9(b)**Distribution of Farmers Reporting Problems with Improved Varieties of Urd in Non-NFSM District Allahabad**

(Figures in %)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	15.79	84.21	100
Available but not on time	73.68	26.32	--	--	--	--	100
Very expensive	26.32	73.68	--	--	--	--	100
Need large doses of other inputs	--	--	--	--	84.21	15.79	100
Much lower yield than expected	--	--	68.42	31.58	--	--	100
Pest resistance not adequate	--	--	31.58	68.42	--	--	100
Total	16.67	16.67	16.67	16.67	16.66	16.66	100

Regarding problems with improved varieties of Moong in NFSM district Lalitpur table-V-10 and table-V-11 reveal that the first major problem of non-availability I.V. seeds of Moong was faced by 5 farmers and ranked 6 by 71 per cent of sample farmers and ranked 5 by 29 per cent of sample farmers. The second problem of untimely availability of I.V. seeds of Moong was faced by 4 farmers and ranked 2 by 57 per cent of sample farmers and ranked 1 by 43 per cent of sample farmers. The third problem of very expensive seeds of I.V. of Moong was faced by 4 farmers and ranked 1 by 57 per cent of sample farmers and ranked 2 by 43 per cent of sample farmers. The fourth problem of the need of large doses of other inputs was faced by 5 farmers and ranked 5 by 71 per cent of sample farmers and ranked 6 by 29 per cent of sample farmers. The problem of much lower yield than expected was faced by 4 farmers and ranked 3 by 57 of sample farmers and ranked 4 by 43 per cent of sample farmers. The problem of inadequate pest resistance was faced by 3 farmers and ranked 3 by 43 per cent of sample farmers and ranked 4 by 57 per cent of sample farmers.

Table-V-10

Farmers Reporting Problems with Improved Varieties of Moong in NFSM District Lalitpur

(Figures in No.)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	2	5	7
Available but not on time	3	4	--	--	--	--	7
Very expensive	4	3	--	--	--	--	7
Need large doses of other inputs	--	--	--	--	5	2	7
Much lower yield than expected	--	--	4	3	--	--	7
Pest resistance not adequate	--	--	3	4	--	--	7
Total	7	7	7	7	7	7	42

Table-V-11**Distribution of Farmers Reporting Problems with Improved Varieties of Moong in NFSM District Lalitpur**

(Figures in %)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	28.57	71.43	100
Available but not on time	42.86	57.14	--	--	--	--	100
Very expensive	57.14	42.86	--	--	--	--	100
Need large doses of other inputs	--	--	--	--	71.43	28.57	100
Much lower yield than expected	--	--	57.14	42.86	--	--	100
Pest resistance not adequate	--	--	42.86	57.14	--	-	100
Total	16.66	16.66	16.66	16.66	16.66	16.66	100

Table-V-12 and table-V-13 reveal that in non-NFSM district Allahabad the problem of Non-availability of I.V. seeds of Arhar was faced by 12 farmers and ranked 6 by 67 per cent of sample farmers and ranked 5 by 33 per cent of sample farmers. The second major problem of untimely availability of I.V. seeds of Arhar was faced by 13 farmers and ranked 1 by 72 per cent of sample farmers and ranked 2 by 28 per cent of the sample farmers. The third problem of very expensive I.V. seeds of Arhar was faced by 13 farmers and ranked 2 by 72 of sample farmers and ranked 1 by 28 per cent of sample farmers. The problem of need of large doses of other inputs was faced by 14 farmers and ranked 3 by 78 per cent of sample farmers and ranked 4 by 22 per cent of sample farmers. The problem of much lower yield than expected was faced by 14 farmers and ranked 4 by 78 per cent of sample farmers and ranked 3 by 22 per cent of sample farmers. The problem of inadequate pest resistance was faced by 12 farmers and ranked 5 by 67 per cent of sample farmers and ranked 6 by 33 per cent of sample farmers.

Table-V-12
Farmers Reporting Problems with Improved Varieties of Arhar in Non-NFSM District
Allahabad

(Figures in No.)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	6	12	18
Available but not on time	13	5	--	--	--	--	18
Very expensive	5	13	--	--	--	--	18
Need large doses of other inputs	--	--	14	4	--	--	18
Much lower yield than expected	--	--	4	14	--	--	18
Pest resistance not adequate	--	--	--	--	12	6	18
Total	18	18	18	18	18	18	108

Table-V-13
Distribution of Farmers Reporting Problems with Improved Varieties of Arhar in
Non NFSM District Allahabad

(Figures in %)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	33.33	66.67	100
Available but not on time	72.22	27.78	--	--	--	--	100
Very expensive	27.78	72.22	--	--	--	--	100
Need large doses of other inputs	--	--	77.78	22.22	--	--	100
Much lower yield than expected	--	--	22.22	77.78	--	--	100
Pest resistance not adequate	--	--	--	--	66.67	33.33	100
Total	16.67	16.67	16.67	16.67	16.66	16.66	100

In case of the problem of I.V. seeds of Pea in NFSM district Lalitpur the data worked out in table-V-14 and table-V-15 reveal that the first major problem of non-availability I.V. seeds of Pea was faced by 46 farmers and ranked 6 by 92 per cent of sample farmers and ranked 5 by 8 per cent of sample farmers. The problem of untimely availability of seeds of Pea was faced by 39

farmers and ranked 1 by 78 per cent of sample farmers and ranked 2 by 22 per cent of sample farmers. The problem of very expensive seeds of Pea was faced by 39 farmers and ranked 2 by 78 per cent of sample farmers and ranked 1 by 22 per cent of sample farmers. The problem of need of large doses of other inputs was faced by 46 farmers and ranked 5 by 92 per cent of sample farmers and ranked 6 by 8 per cent of sample farmers. The problem of much lower yield than expected was faced by 39 farmers and ranked 3 by 78 per cent of sample farmers and ranked 4 by 22 per cent of sample farmers. The problem of inadequate pest resistance was faced by 39 farmers and ranked 4 by 78 per cent of sample farmers.

Table-V-14
Farmers Reporting Problems with Improved Varieties of Pea in NFSM District Lalitpur
 (Figures in No.)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	4	46	50
Available but not on time	39	11	--	--	--	--	50
Very expensive	11	39	--	--	--	--	50
Need large doses of other inputs	--	--	--	--	46	4	50
Much lower yield than expected	--	--	39	11	--	--	50
Pest resistance not adequate	--	--	11	39	--	--	50
Total	50	50	50	50	50	50	300

Table-V-15
Distribution of Farmers Reporting Problems with Improved Varieties of Pea in NFSM District Lalitpur
 (Figures in %)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	8.00	92.00	100
Available but not on time	78.00	22.00	--	--	--	--	100
Very expensive	22.00	78.00	--	--	--	--	100
Need large doses of other inputs	--	--	--	--	92.00	8.00	100
Much lower yield than expected	--	--	78.00	22.00	--	--	100
Pest resistance not adequate	--	--	22.00	78.00	--	-	100
Total	100.00	100.00	100.00	100.00	100.00	100.00	100

Regarding problems of I.V. seeds of Masoor the data worked-out in table-V-16 and table-V-17 reveal that the problem of non-availability of I.V. seeds of Masoor in non-NFSM district, Allahabad was faced by 44 farmers and ranked 6 by 88 per cent of sample farmers and ranked 5 by 12 per cent of sample farmers. The problem of untimely availability of seeds of Masoor was faced by 34 farmers and ranked 1 by 68 per cent of sample farmers and ranked 2 by 32 per cent of the sample farmers. The problem of very expensive I.V. seeds of Masoor was faced by 34 farmers and ranked 2 by 68 per cent of sample farmers and ranked 1 by 32 per cent of the sample farmers. The next problem of need of large doses of other inputs was reported by 44 farmers and ranked 5 by 88 per cent of sample farmers and ranked 6 by 12 per cent of sample farmers. The problem of much lower yield than expected was faced by 37 farmers and ranked 3 by 76 per cent of sample farmers and ranked 4 by 24 per cent of sample farmers. The problem of inadequate pest resistance faced by 37 farmers was ranked 4 by 76 per cent of sample farmers and ranked 3 by 24 per cent of sample farmers.

Table-V-16

Farmers Reporting Problems with Improved Varieties of Masoor in Non NFSM District Allahabad

(Figures in No.)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	6	44	50
Available but not on time	34	16	--	--	--	--	50
Very expensive	16	34	--	--	--	--	50
Need large doses of other inputs	--	--	--	--	44	6	50
Much lower yield than expected	--	--	37	13	--	--	50
Pest resistance not adequate	--	--	13	37	--	--	50
Total	50	50	50	50	50	50	300

Table-V-17**Distribution of Farmers Reporting Problems with Improved Varieties of Masoor in Non NFSM District Allahabad**

(Figures in %)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	12.00	88.00	100
Available but not on time	68.00	32.00	--	--	--	--	100
Very expensive	32.00	68.00	--	--	--	--	100
Need large doses of other inputs	--	--	--	--	88.00	12.00	100
Much lower yield than expected	--	--	76.00	24.00	--	--	100
Pest resistance not adequate	--	--	24.00	76.00	--	--	100
Total	16.67	16.67	16.67	16.67	16.66	16.66	100

Table-V-18 and table-V-19 reveal the problems of I.V. seeds of Gram in non-NFSM district Allahabad, wherein non-availability of I.V. seeds of Gram faced by 13 farmers was ranked 6 by 62 per cent of sample farmers and ranked 5 by 38 per cent of sample farmers. The untimely availability of seeds of Gram reported by 16 farmers was ranked 1 by 76 per cent of sample farmers and ranked 2 by 24 per cent of sample farmers. The problem of very expensive seeds faced by 16 farmers was ranked 2 by 76 per cent of sample farmers and ranked 1 by 24 per cent of sample farmers. The problem i.e. need of large doses of other inputs reported by 17 farmers was ranked by 81 per cent of sample farmers and ranked 4 by 19 per cent of sample farmers. The problem of much lower yield than expected reported by 17 farmers was ranked 4 by 81 per cent of sample farmers and ranked 3 by 19 per cent of sample farmers. While the problem of inadequate pest resistance reported by 13 farmers was ranked 5 by 62 per cent of sample farmers and ranked 6 by 38 per cent of sample farmers.

Table-V-18

**Farmers Reporting Problems with Improved Varieties of Gram in Non NFSM District
Allahabad**

(Figures in No.)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	8	13	21
Available but not on time	16	5	--	--	--	--	21
Very expensive	5	16	--	--	--	--	21
Need large doses of other inputs	--	--	17	4	--	--	21
Much lower yield than expected	--	--	4	17	--	--	21
Pest resistance not adequate	--	--	--	--	13	8	21
Total	21	21	21	21	21	21	126

Table-V-19

**Distribution of Farmers Reporting Problems with Improved Varieties of Gram in Non
NFSM District Allahabad**

(Figure in %)

Problems	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Not available at all	--	--	--	--	38.10	61.90	100
Available but not on time	76.19	23.81	--	--	--	--	100
Very expensive	23.81	76.19	--	--	--	--	100
Need large doses of other inputs	--	--	80.95	19.05	--	--	100
Much lower yield than expected	--	--	19.05	80.95	--	--	100
Pest resistance not adequate	--	--	--	--	61.90	38.10	100
Total	16.67	16.67	16.67	16.67	16.66	16.66	100

V-5: Solutions for Problems of Improved Varieties of Important Pulses

The solution for problems of improved varieties of pulses suggested by farmers in NFSM district Lalitpur worked out in table-V-20(a) and table-V-21(a) reveal that cheaper availability of I.V. seeds suggested by 36 farmers was ranked 1 by 72 per cent of sample farmers ranked 2 by 26 per cent and ranked 3 by 2 per cent of sample farmers. Timely availability of I.V. seeds suggested by 38 farmers was ranked 3 by 76 per cent of sample farmers, ranked 2 by 18 per cent and ranked 1 by 6 per cent of sample farmers. To increase the subsidy involved in the purchase of I.V. seeds 28 farmers suggested in favour was ranked 2 by 56 per cent of sample farmers, ranked 2 by the 22 per cent and ranked 1 by the 22 per cent of the sample farmers. The other solution suggested by the farmers were ranked 4 by 100 per cent of sample farmers.

Table-V-20(a)

Farmers Suggested Solutions for Problems of Improved Varieties in NFSM District Lalitpur

(Figures in No.)

Solutions	Rank 1	Rank 2	Rank 3	Rank 4	Total
Cheaper availability of Seeds	36	13	1	--	50
Timely availability of Seeds	3	9	38	--	50
Subsidy	11	28	11	--	50
Any Other (Specify)	--	--	--	50	50
Total	50	50	50	50	200

Table-V-21(a)

Distribution of Farmers Suggested Solutions for Problems of Improved Varieties in NFSM District Lalitpur

(Figures in %)

Solutions	Rank 1	Rank 2	Rank 3	Rank 4	Total
Cheaper availability of Seeds	72.00	26.00	2.00	--	100
Timely availability of Seeds	6.00	18.00	76.00	--	100
Subsidy	22.00	56.00	22.00	--	100
Any Other (Specify)	--	--	--	100.00	100
Total	100.00	100.00	100.00	100.00	100

While in non-NFSM district Allahabad the solutions suggested by the farmers for problems of improved varieties of pulses analysed in table-V-20(b) and table-V-21(b) reveal that the cheaper availability of seeds suggested by the majority i.e. 40 farmers was ranked 1 by 80 per cent of the sample farmers ranked 2 by 10 per cent and 8 ranked 3 by 10 per cent of sample farmers. Timely availability of seeds suggested by 28 farmers was ranked 3 by 56 per cent of sample farmers, ranked 2 by 40 per cent and ranked 1 by 4 per cent of sample farmers. Subsidy involved in the purchase of I.V. seeds suggested by 25 farmers was ranked 2 by 50 per cent of sample farmers, ranked 3 by 34 per cent and ranked 1 by the 16 per cent sample farmers. Other solutions suggested by all the farmers was ranked 4 by 100 per cent of the sample farmers.

Table-V-20(b)

Farmers Suggested Solutions for Problems of Improved Varieties in Non NFSM District Allahabad

(Figures in No.)

Solutions	Rank 1	Rank 2	Rank 3	Rank 4	Total
Cheaper availability of Seeds	40	5	5	--	50
Timely availability of Seeds	2	20	28	--	50
Subsidy	8	25	17	--	50
Any Other (Specify)	--	--	--	50	50
Total	50	50	50	50	200

Table-V-21(b)

Distribution of Farmers Suggested Solutions for Problems of Improved Varieties in Non NFSM District Allahabad

(Figures in %)

Solutions	Rank 1	Rank 2	Rank 3	Rank 4	Total
Cheaper availability of Seeds	80.00	10.00	10.00	--	100
Timely availability of Seeds	4.00	40.00	56.00	--	100
Subsidy	16.00	50.00	34.00	--	100
Any Other (Specify)	--	--	--	100.00	100
Total	25.00	25.00	25.00	25.00	100

V-6: Marketing Channels for Pulses:

Table-V-22(a) and table-V-23(a) reveal various marketing channels for pulses in NFSM district Lalitpur where in all the 50 sample farmers i.e. 100 per cent of the sample reported to sell their produce through regulated markets. Also few of the sample farmers i.e. 54 per cent reported to sell some of the produce through other marketing channels in this district. Thus, in NFSM district Lalitpur apart from regulated markets some other marketing channels were also used by 54 per cent i.e. more than half of the sample farmers.

Table—V-22(a)

Farmers Marketing Pulses through Various Channels in NFSM district Lalitpur
(Figures in No.)

Size of farmers	Village Market	Common Agent	Regulated Market	Govt. Agencies (NAFED)	Others	Total
Marginal	--	--	8	--	5	8
Small	--	--	27	--	15	27
Medium	--	--	15	--	7	15
Large	--	--	--	--	--	--
Total	--	--	50	--	27	50

Table-V-23(a)

Farmers Marketing Pulses through Various Channels in NFSM district Lalitpur

(Figures in %)

Size of farmers	Village Market	Common Agent	Regulated Market	Govt. Agencies (NAFED)	Others	Total
Marginal	--	--	100.00	--	62.50	100
Small	--	--	100.00	--	55.56	100
Medium	--	--	100.00	--	46.67	100
Large	--	--	--	--	--	100
Total	--	--	100.00	--	54.00	100

While table-V-22(b) and table-V-23(b) reveal that in non-NFSM district Allahabad almost all the 50 i.e. 100 per cent of the sample farmers reported to sell their pulses produce through the village market only. Thus, in this district marketing of pulses produce was quite unorganized which clarifies that national food security mission (2008) was ineffective in this district.

Table-V-22(b)

Farmers Marketing Pulses Through Various Channels in non-NFSM district Allahabad
(Figures in No.)

Size of Farmers	Village Market	Common Agent	Regulated Market	Govt. Agencies (NAFED)	Others	Total
Marginal	6	--	--	--	--	100
Small	6	--	--	--	--	100
Medium	37	--	--	--	--	100
Large	1	--	--	--	--	100
Total	50	--	--	--	--	100

Table-V-23(b)

Farmers Marketing Pulses Through Various Channels in non-NFSM district Allahabad
(Figures in %)

Size of Farmers	Village Market	Common Agent	Regulated Market	Govt. Agencies (NAFED)	Others	Total
Marginal	100.00	--	--	--	--	100
Small	100.00	--	--	--	--	100
Medium	100.00	--	--	--	--	100
Large	100.00	--	--	--	--	100
Total	100.00	--	--	--	--	100

V-7: Quantity of Pulses Marketed:

Table-V-24(a) and table-V-24(b) reveal the quantity of Urd sold through various channels in NFSM district Lalitpur and non-NFSM district Allahabad wherein in the NFSM district Lalitpur on an average 922.90 qtls of urd was sold for Rs. 22.11 lakhs of 796.07 qtls was sold through regulated markets and remaining 126.83 qtls. through other channels. Thus, maximum

marketable surplus was marketed through regulated market in NFSM district Lalitpur. The size group-wise analysis indicates that large quantity of urd was sold by small and medium farmers in this district. While in non-NFSM district Allahabad only 83.75 qtls of urd was sold on an average through village markets and the maximum i.e. 74.30 qtls of urd was sold by medium farmers. Thus, in this district marketing of urd was scanty.

Table-V-24(a)

Quantity of Urd Sold Through Various Channels in NFSM district Lalitpur

(Unit Qty. in Qtls & Price in Rs.)

Size of Farmers	Village Market		Comm. Market		Regulated Market		Govt. Agencies (NAFED)		Others (____)		Total	
	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price
Marginal	--	--	--	--	38.77	100685	--	--	11.88	28535	50.65	129220
Small	--	--	--	--	300.20	730858	--	--	41.85	89992	342.05	820850
Medium	--	--	--	--	457.10	1100620	--	--	73.10	160460	530.20	1261080
Large	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	796.07	1932163	--	--	126.83	278987	922.90	2211150

Table-V-24(b)

Quantity of Urd Sold Through Various Channels in Non NFSM District Allahabad

(Unit Qty. in Qtls & Price in Rs.)

Size of Farmers	Village Market		Comm. Market		Regulated Market		Govt. Agencies (NAFED)		Others (____)		Total	
	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price
Marginal	--	--	--	--	--	--	--	--	--	--	--	--
Small	--	--	--	--	--	--	--	--	--	--	--	--
Medium	74.30	179161	--	--	--	--	--	--	--	--	74.30	179161
Large	9.45	21050	--	--	--	--	--	--	--	--	9.45	21050
Total	83.75	200211	--	--	--	--	--	--	--	--	83.75	200211

Table-V-25 reveals the quantity of Moong sold through various channels in NFSM district Lalitpur wherein, on an average 77.87 qtls. of Moong was sold of which the maximum i.e. 71.80 qtls was sold through regulated markets and that too by medium farmers in this district. The quantity sold by other channels was meager and almost total was sold by medium farmers.

Table-V-25**Quantity of Moong Sold Through Various Channels in NFSM district Lalitpur**

(Qty. in Qtls & Price in Rs.)

Size of Farmers	Village Market		Comm. Market		Regulated Market		Govt. Agencies (NAFED)		Others (____)		Total	
	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price
Marginal	--	--	--	--	--	--	--	--	--	--	--	--
Small	--	--	--	--	1.80	5375	--	--	0.07	175	1.87	5550
Medium	--	--	--	--	70.00	225530	--	--	6.00	17880	76.00	243410
Large	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	71.80	230905	--	--	6.07	18055	77.87	248960

Table-V-26 reveals that in non-NFSM district Allahabad the quantity of Arhar sold through village markets was accounted to total 140 qtls in this district and the maximum of it i.e. 133 qtls was sold by the medium farmers. Thus, in this district medium farmers were the main producers of pulses who have the marketable surplus too.

Table-V-26**Quantity of Arhar Sold Through Various Channels in non-NFSM district Allahabad**

(Qty. in Qtls & Price in Rs.)

Size of Farmers	Village Market		Comm. Market		Regulated Market		Govt. Agencies (NAFED)		Others (____)		Total	
	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price
Marginal	--	--	--	--	--	--	--	--	--	--	--	--
Small	7.00	19600	--	--	--	--	--	--	--	--	7.00	19600
Medium	133.00	391345	--	--	--	--	--	--	--	--	133.00	391345
Large	--	--	--	--	--	--	--	--	--	--	--	--
Total	140.00	410945	--	--	--	--	--	--	--	--	140.00	410945

Table-V-27 reveals that quantity of Pea sold through various channels in NFSM district Lalitpur wherein the total variety of Pea sold was reported to 1086.49 qtls of which the maximum i.e. 897.94 qtls was sold through regulated markets and the large quantity was sold by small as well as medium farmers of this district. Through other channels only 188.55 qtls of Pea was sold of which the maximum quantity was reported to be sold by the small and medium farmers. Thus, role of the regulated markets seems to be significant in this district and as such it may be said that national food security mission is effective in this district.

Table-V-27**Quantity of Pea Sold Through Various Channels in NFSM district Lalitpur**

(Unit Qty. in Qtls & Price in Rs.)

Groups	Village Market		Comm. Market		Regulated Market		Govt. Agencies (NAFED)		Others (____)		Total	
	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price
Marginal	--	--	--	--	77.94	148083	--	--	11.45	20267	89.39	168350
Small	--	--	--	--	270.25	637425	--	--	83.45	179423	353.70	816848
Medium	--	--	--	--	549.75	1241785	--	--	93.65	203675	643.40	1445460
Large	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	897.94	2027293	--	--	188.55	403365	1086.49	2230658

Table-V-28 reveals that the total quantity of Masoor sold through village markets in Non-NFSM district Allahabad was reported to be 1074.25 qtls of which the maximum i.e. 932.80 qtls was sold by medium farmers. The quantity of Masoor sold by small and large farmers was also considerable in this district.

Table-V-28**Quantity of Masoor Sold Through Various Channels in Non NFSM District Allahabad**

(Qty. in Qtls & Price in Rs.)

Groups	Village Market		Comm. Market		Regulated Market		Govt. Agencies (NAFED)		Others (____)		Total	
	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price
Marginal	17.95	43595	--	--	--	--	--	--	--	--	17.95	43595
Small	63.50	170500	--	--	--	--	--	--	--	--	63.50	170500
Medium	932.80	2506995	--	--	--	--	--	--	--	--	932.80	2506995
Large	60	160500	--	--	--	--	--	--	--	--	60	160500
Total	107425	2881590	--	--	--	--	--	--	--	--	107425	2881590

Table-V-29 reveals that non-NFSM district Allahabad also the total quantity of Gram was sold only through the village markets and the maximum quantity i.e. 128.40 qtls was sold by the medium farmers. The quantity of Gram sold by the marginal and large farmers in this district was reported to be nil. Thus, in this district the quantity of pulses sold was found to be quite meagre and as such it is clarified that National Food Security Mission (2008) was not at all effective in this district.

Table-V-29

Quantity of Gram Sold Through Various Channels in Non NFSM District Allahabad

(Qty. in Qtls & Price in Rs.)

Groups	Village Market		Comm. Market		Regulated Market		Govt. Agencies (NAFED)		Others (—)		Total	
	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price	Qty. Sold	Price
Marginal	--	--	--	--	--	--	--	--	--	--	--	--
Small	7.70	17370	--	--	--	--	--	--	--	--	7.70	17370
Medium	128.40	307035	--	--	--	--	--	--	--	--	128.40	307035
Large	--	--	--	--	--	--	--	--	--	--	--	--
Total	--	--	--	--	--	--	--	--	--	--	--	--

V-8: Procurement of Pulses by Govt. (NAFED) from Farmers:

Table-V-30(a) and table-V-30(b) reveal that the procurement of pulses from farmers by government (NAFED) in both NFSM district Lalitpur as well as non-NFSM district Allahabad was reported to be nil. Thus, it is very well clarified that in both districts undertaken for this study no procurement was done by the government (NAFED).

Table-V-30(a)

Procurement of Pulses from Farmers by Govt. (NAFED) in NFSM District Lalitpur

Size of Farmers	No. of Farmers from whom procured	Total No. of Farmers in the Size Group	% of Farmers from whom Procured
Marginal	No Procurement	No Procurement	No Procurement
Small	No Procurement	No Procurement	No Procurement
Medium	No Procurement	No Procurement	No Procurement
Large	No Procurement	No Procurement	No Procurement
Total	No Procurement	No Procurement	No Procurement

Table-V-30(b)

Procurement of Pulses from Farmers by Govt. (NAFED) in Non NFSM District Allahabad

Size of Farmers	No. of Farmers from whom procured	Total No. of Farmers in the Size Group	% of Farmers from whom Procured
Marginal	No Procurement	No Procurement	No Procurement
Small	No Procurement	No Procurement	No Procurement
Medium	No Procurement	No Procurement	No Procurement
Large	No Procurement	No Procurement	No Procurement
Total	No Procurement	No Procurement	No Procurement

CHAPTER -VI

FARMER'S PERCEPTIONS

The present chapter deals with the perceptions of sample farmers of NFSM district Lalitpur and non-NFSM district Allahabad of the state of Uttar Pradesh in respects of the appropriate reasons for growing pulses, criteria used while opting to grow pulses, reasons for low area under pulses in general pulses grown on inferior quality of land, problems of growing pulses on inferior quality of land, reasons for shifting from pulses to other crops, major pest problems, major problems in cultivating pulses, important suggestions and whether farmers are willing to grow more pulses if government provides assured procurement are discussed in the following paragraphs:-

VI-1: Reasons for growing pulses in NFSM and Non-NFSM districts

The main reasons for growing pulses by the sample farmers of Lalitpur (NFSM) and Allahabad (Non-NFSM) districts are worked out in tables-VI-1 to VI-2 as follows:

Table-VI-1

Reasons for Growing Pulses: NFSM District Lalitpur

Reasons	No. of Farmers	% of Farmers
Home Consumption	--	--
Animal feed	--	--
Inferior quality of land	8	16.00
Lack of irrigation	6	12.00
Profitability	16	32.00
Others (Suitability of Soil)	20	40.00
Total	50	100.00

Table-VI-1 reveals that mostly farmers were growing pulses in Lalitpur district because of the main reason i.e. suitability of soil as viewed by 40 per cent of sample farmers and hence they could not cultivate other than pulse crops. The next reason was profitability 32 per cent sample

farmers opined their views in favour of inferior quality of land and 12 percent in favour of lack of irrigation facilities.

Table – VI-2

Size group-wise No. of Farmers giving Reasons for Growing Pulses in NFSM District Lalitpur (2008-09)

(Unit in Numbers)

Reasons							
Size Groups of farmers	Home consumption	Animal feed	Inferior quality of land	Lack of irrigation	Profitability	Others	Total
Marginal	--	--	2	1	1	4	8
Small	--	--	4	2	9	12	27
Medium	--	--	2	3	6	4	15
Large	--	--	--	--	--	--	--
Total	--	--	8	6	16	20	50
% of Farmers to Total Farmers in The Size Groups (in %)							
Size Groups of farmers	Home consumption	Animal feed	Inferior quality of land	Lack of irrigation	Profitability	Others	Total
Marginal	--	--	25.00	12.50	12.50	50.00	100.00
Small	--	--	14.82	4.41	33.33	44.44	100.00
Medium	--	--	13.33	20.00	40.00	26.67	100.00
Large	--	--	--	--	--	--	--
Total	--	--	16.00	12.00	32.00	40.00	100.00

The size group-wise analysis of the sample farmers of NFSM Lalitpur district on reasons for growing pulses worked out in table-VI-2 indicates that 50 per cent of the sample marginal farmers opined reason for growing pulses as other (Suitability of soil). It was also viewed by 44.44 per cent of small and 26.67 per cent of medium farmers. About 40.00 per cent, 33.33 per cent and 12.50 per cent of medium, small and marginal farmers respectively viewed profitability for growing pulses. About 20.50 per cent, 12.50 per cent and 4.41 per cent of medium, marginal and small farmers respectively viewed lack of irrigation for growing pulses. About 25.00 per cent, 14.82 per cent and 13.33 per cent of marginal, small and medium farmers respectively told that main reason for growing pulses was inferior quality of land in Lalitpur district.

Table-VI-3

Main Reasons for Growing Pulses in Non-NFSM District Allahabad

(In %)

Reasons	No. of Farmers	% of Farmers to total No. of Farmers
Home Consumption	--	--
Animal feed	--	--
Inferior quality of land	5	10.00
Lack of irrigation	38	76.00
Profitability	7	14.00
Others	--	--
Total	50	100.00

Table – VI-4

Size Group-wise No. of Farmers Reporting Reasons for Growing Pulses in Non-NFSM District Allahabad

Reasons							
Size Groups of farmers	Home consumption	Animal feed	Inferior quality of land	Lack of irrigation	Profitability	Others	Total
Marginal	--	--	--	3	3	--	6
Small	--	--	--	3	3	--	6
Medium	--	--	5	32	--	--	37
Large	--	--	--	--	1	--	1
Total	--	--	5	38	7	--	50
% of Farmers to Total Farmers in The Size Groups							
Size Groups of farmers	Home consumption	Animal feed	Inferior quality of land	Lack of irrigation	Profitability	Others	Total
Marginal	--	--	--	50.00	50.00	--	100.00
Small	--	--	--	50.00	50.00	--	100.00
Medium	--	--	13.51	86.49	--	--	100.00
Large	--	--	--	--	100.00	--	--
Total	--	--	10.00	76.00	14.00	--	100.00

Table-VI-3 reveals that the majority i.e. 76 per cent of the sample farmers opined their reason for growing pulses as lack of irrigation. While 14 per cent and 10 per cent of sample farmers reported profitability and inferior quality of land as the main reasons respectively in the non-NFSM district Allahabad. Table-VI-4 reveals that on an average 14 per cent profitability and 76 per cent lack of irrigation as main reason. The size-group-wise analysis shows that 100 per cent of large farmers told profitability and 86 per cent of medium farmers told lack of irrigation as main reason.

VI:2: Criteria used while opting to grow pulses

There are several criteria for the cultivation of pulses but important among them are extent of soil suitability, inferior quality of land and lack of irrigation facilities. These criteria are generally used while deciding area allocation under pulses. The responses of the sampled farmers belonging to NFSM district Lalitpur and Non-NFSM district Allahabad were also sought with responses which are brought out in table-VI-5 and VI-6

Table-VI-5

Criteria Used While Opting to Grow Pulses in NFSM Lalitpur District (2008-09)

Reasons	No. of Farmers	% of Farmers to total No. of Farmers
Rainfall	--	--
Soil Suitability	25	50.00
Home Requirement	--	--
Inferior Quality of Land	20	40.00
Extent of Irrigation	5	10.00
Others	--	--
Total	50	100.00

Table-VI-5 reveals that among the sample farmers of NFSM Lalitpur district 25 per cent of farmers opined that soil suitability was the criteria for growing pulses, followed by the types of inferior quality of land for pulses as indicated by 20 per cent of the sample farmers. Since the rainfall is not regular and adequate in this area, it was also the criteria for growing pulses in cases of the 5 per cent of the farmers as pulses can be grown under less rainfall condition.

Table-VI-6
Criteria Used While Opting to Grow Pulses in Non NFSM District Allahabad

Reasons	No. of Farmers	% of Farmers to total No. of Farmers
Rainfall	--	--
Soil Suitability	20	40.00
Home Requirement	--	--
Inferior Quality of Land	18	36.00
Extent of Irrigation	12	24.00
Others	--	--
Total	50	100.00

Table-VI-6 reveals the criteria used for opting to grow pulses by the sample farmers of Allahabad non-NFSM district and indicates that 40 per cent of the sample farmers opted to grow pulses because of soil suitability and 36 per cent felt that their inferior quality of land was the criteria for growing pulses.

VI:3: Reasons for low area under pulses in general

The reasons for low area under pulses in general worked-out in table-VI-7 & table-VI-8 for different reasons for less area under pulses in NFSM and Non-NFSM districts told by the majority of farmers in both districts.

Table-VI-7
Reasons for Low Area under Pulses in NFSM Lalitpur District (2008-09)

Reasons	No. of Farmers	% of Farmers to total No. of Farmers
Low Profitability	--	--
Low Yield	5	10.00
Instability (Yield or price or both)	4	8.00
Marketing Problem	9	18.00
Pest Problems	18	36.00
Others	14	28.00
Total	50	100.00

Table-VI-7 reveals that the main reasons viewed by the majority of sample farmers of NFSM Lalitpur district i.e. 36 per cent for less area under pulses was pest problems. Also the reasons given by 28 per cent of farmers was other reasons, 18 per cent of the farmers viewed marketing

problems and 10 per cent of the farmers told low yield, 8 per cent farmers viewed instability in production of pulses respectively in NFSM district Lalitpur. Thus, main reason of low area was pest problem.

Table-VI-8
Reasons for Low Area under Pulses in Non NFSM District Allahabad

Reasons	No. of Farmers	% of Farmers to total No. of Farmers
Low Profitability	3	6.00
Low Yield	8	16.00
Instability (Yield or price or both)	9	18.00
Marketing Problem	7	14.00
Pest Problems	12	24.00
Others	11	22.00
Total	50	100.00

Table-VI-8 reveals that in non-NFSM district Allahabad the main reasons for less area under pulses as opined by 24 per cent of the sample farmers was pest problems. Next reason was other problems of pulses as told by 22 per cent of sample farmers. Thus, in non-NFSM district Allahabad also the main reason of low area was pest problems.

VI:4: Pulse and other crops grown on inferior quality of land

The reasons for pulses grown on inferior quality of land are given in the table-VI-9 for NFSM district Lalitpur and table-VI-10 for non-NFSM district Allahabad.

Table-VI-9

Pulses and other Grown on Inferior Quality of Lands in NFSM Lalitpur District (2008-09)

Reasons	No. of Farmers	% of Farmers to total No. of Farmers
Superior Cereals	--	--
Coarse Cereals	--	--
Pulses	50	100.00
Oilseeds	--	--
Vegetables	--	--
Any Others (Specify)	--	--
Total	50	100.00

Table-VI-9 reveals that the main reason for pulses and other crops grown on inferior quality of land in NFSM district Lalitpur opined by 100 per cent farmers for growing pulses on inferior land. Thus, pulses in NFSM district Lalitpur are grown on inferior land only.

Table-VI-10

Pulses and other Crops Grown on Inferior Quality Lands in Non NFSM District Allahabad

Reasons	No. of Farmers	% of Farmers to total No. of Farmers
Superior Cereals	--	--
Coarse Cereals	5	10.00
Pulses	40	80.00
Oilseeds	5	10.00
Vegetables	--	--
Any Others (Specify)	--	--
Total	50	100.00

Table-VI-10 reveals that the main reason for pulses and other crops grown on inferior quality of land in Non-NFSM district Allahabad was opined by 80 per cent of the sample farmers. Thus, in non-NFSM district Allahabad also pulses are grown on inferior land only.

VI:5: Problems of growing pulses on inferior quality of land

The main problems of growing pulses on inferior quality of land are highlighted in table-VI-11 for NFSM district Lalitpur and table-VI-12 for non-NFSM district Allahabad.

Table-VI-11

Main Problems of Growing Pulses on Inferior Quality Lands in NFSM Lalitpur District (2008-09)

Sl. No.	Reasons	No. of Farmers	% of Farmers to total No. of Farmers
1	Yield is Low	11	22.00
2	Grain Quality is Poor	13	26.00
3	Both 1 and 2	26	52.00
	Total	50	100.00

Table-VI-11 reveals that in NFSM district Lalitpur about 22 per cent of sample farmers viewed lower yield, 26.00 per cent of sample farmers told grain quality was poor when grown on inferior quality of land and both combined together the lower yield and poor quality of grain was the problem opined by 52.00 per cent of sample farmers of Lalitpur a NFSM district. Thus, low yield including poor grain quality was the main problem of pulses growers in NFSM district Lalitpur.

Table-VI-12

Main Problems of Growing Pulses on Inferior Quality Lands in Non NFSM District Allahabad

Sl. No.	Reasons	No. of Farmers	% of Farmers to total No. of Farmers
1	Yield is Low	8	16.00
2	Grain Quality is Poor	4	8.00
3	Both 1 and 2	38	76.00
	Total	50	100.00

Table-VI-12 reveals that in non-NFSM district Allahabad also the majority i.e. 76 per cent of sample farmers both low yield and poor quality of grain to be the main problem of growing pulses on inferior quality of land. Thus, in non-NFSM district Allahabad too the same problem was reported generally by majority of farmers.

VI:6: Reasons for shifting from pulses to other crops

The main reasons for shifting from pulses to other crops are highlighted in table-VI-13 for NFSM district Lalitpur and in table-IV-14 for non-NFSM district Allahabad.

Table-VI-13

Main Reasons for Shifting from Pulses to other Crops in NFSM Lalitpur District (2008-09)

Reasons	No. of Farmers	% of Farmers to total No. of Farmers
Yield is Low	2	22.22
Price Realization is Low	2	22.22
No. Assured Market	1	11.12
Yield of Improved Varieties is Uncertain	2	22.22
Large Doses of Other Inputs Required	--	--
Any other (Specify)	2	22.22
Total	9	100.00

Table-VI-13 indicates that in NFSM district Lalitpur about 32 per cent of sample farmers opined the reasons for shifting from pulses cultivation to other crops as low yield of pulses, low price realization, uncertain yield of improved varieties and lack of assured markets. Thus, in NFSM district Lalitpur low yield as well as low price realization was the main reasons for shifting of pulses to other crops.

Table-VI-14

Main Reasons for Shifting from Pulses to other Crops in Non NFSM District Allahabad

Reasons	No. of Farmers	% of Farmers to total No. of Farmers
Yield is Low	2	40
Price Realization is Low	1	20
No. Assured Market	1	20
Yield of Improved Varieties is Uncertain	1	20
Large Doses of Other Inputs Required	--	--
Any other (Specify)	--	--
Total	5	100

Table-VI-14 reveals that in non-NFSM district Allahabad 40 per cent of the sample farmers opined low yield as main reason for the shifting from pulses to other crops. The other valid reasons were low price, lack of assured markets and uncertain yield of I.V. of pulses. Thus, the main reason for shift from pulses to other crops in this district was low yield.

VI:7: Major pest problems

The major pest problems reported by sample farmers of NFSM and non-NFSM district are analysed in tables-VI-15 and IV-16

Table-VI-15
Major Pest Problems in NFSM District Lalitpur

Type of Pests	No. of Farmers Reporting Problems	% of farmers to Total No. of Farmers	Area Affected in Acre	Estimated Yield Loss Qtls. Per Acre
Pod Borer	3	6.00	3.55	3.50
Pod Fly	48	96.00	161.70	30.00
Wilt	10	20.00	10.55	6.40
Poor rot	6	12.00	9.00	4.25
Nematodes	5	10.00	5.00	4.00
Any other (specify)	--	--	--	--

Table-VI-15 indicates that in NFSM district Lalitpur the majority i.e. 96 per cent of sample farmers reported pod fly major pest problem in growing pulses. Other major pest problems were wilt, poor rot, pod borer and nematodes in Lalitpur district. The maximum yield loss due to pod fly pest problem was 30 Qtls. per acre among the selected farmers of Lalitpur district. Thus, the major pest of pulses was pod fly in NFSM district.

Table-VI-16
Major Pest Problems in Non NFSM District Allahabad

Type of Pests	No. of Farmers Reporting Problems	% of farmers to Total No. of Farmers	Area Affected in Acre	Estimated Yield Loss Qtls. Per Acre
Pod Borer	4	8.00	4.85	4.60
Pod Fly	46	92.00	147.03	33.00
Wilt	8	16.00	11.45	7.20
Poor rot	5	10.00	9.50	5.25
Nematodes	4	8.00	6.00	6.00
Any other (specify)	--	--	--	--

Table-VI-16 reveals that in non-NFSM district Allahabad also pod fly was major pest problem in growing pulses as opined by the majority i.e. 92 per cent of sample farmers. The maximum yield loss due to pod fly pest problem was 33 qtls per acre among the selected farmers. Thus, in this district also pod fly was the main pest which caused maximum yield loss in pulses.

VI:8: Major problems in cultivating pulses

The major problems faced by the sampled pulses growing farmers of NFSM district Lalitpur and non-NFSM district Allahabad are analyzed in table-VI-17 & VI-17(a) and table-VI-18 & VI-18(a) as follows:

Table-VI-17
Major Problems in Cultivating Pulses in NFSM Lalitpur District (2008-09)

(in nos.)							
Reasons	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Lack of irrigation facilities	--	--	--	40	10	--	50
Lack of improved varieties	35	15	--	--	--	--	50
Lower yield	15	35	--	--	--	--	50
Large doses of other inputs required	--	--	10	--	40	--	50
Low Market Price	--	--	40	--	--	10	50
No assured market	--	--	--	--	--	--	--
Any other (specify)	--	--	--	10	--	40	50
Total	50	50	50	50	50	50	300

Table-VI-17(a)
% Distribution of Major Problems in Cultivating Pulses in NFSM Lalitpur District (2008-09)

(in %)							
Reasons	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Lack of irrigation facilities	--	--	--	80.00	20.00	--	100
Lack of improved varieties	70.00	30.00	--	--	--	--	100
Lower yield	30.00	70.00	--	--	--	--	100
Large doses of other inputs required	--	--	20.00	--	80.00	--	100
Low Market Price	--	--	80.00	--	--	20.00	100
No assured market	--	--	--	--	--	--	--
Any other (specify)	--	--	--	20.00	--	80.00	100
Total	100.00	100.00	100.00	100.00	100.00	100.00	100

Table-VI-17 and table-VI-17(a) reveal distribution of farmers according to rank wise problems faced by them in cultivation of pulses wherein sample farmers reported lack of improved varieties seeds of pulses and rank one. Lower yield was the second major problems told by 70 per cent of the farmers and ranked 2. Low market price was the third major problems reported by 80 per cent of the farmers and ranked 3. Lack of irrigation facilities and large doses of other inputs required each problem was ranked fourth and fifth faced by 80 per cent of sample farmers. Any other problem i.e. menace of blue-cow was also a problem which ranked 6 by 80 per cent of sample farmers in NFSM district Lalitpur.

Table-VI-18
Major Problems in Cultivating Pulses in Non NFSM District Allahabad

(In Nos.)

Reasons	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Lack of irrigation facilities	--	--	30	20	--	--	50
Lack of improved varieties	40	10	--	--	--	--	50
Lower yield	10	40	--	--	--	--	50
Large doses of other inputs required	--	--	20	30	--	--	50
Low Market Price	--	--	--	--	38	12	50
No assured market	--	--	--	--	12	38	50
Any other (specify)	--	--	--	--	--	--	--
Total	50	50	50	50	50	50	300

Table-VI-18(a)
% Distribution of Major Problems in Cultivating Pulses in Non NFSM District Allahabad

(No. of Farmers)

Reasons	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Lack of irrigation facilities	--	--	60.00	40.00	--	--	100
Lack of improved varieties	80.00	20.00	--	--	--	--	100
Lower yield	20.00	80.00	--	--	--	--	100
Large doses of other inputs required	--	--	40.00	60.00	--	--	100
Low Market Price	--	--	--	--	76.00	24.00	100
No assured market	--	--	--	--	24.00	76.00	100
Any other (specify)	--	--	--	--	--	--	--
Total	16.67	16.67	16.67	16.67	16.66	16.66	100

Table-VI-18 and VI-18(a) reveal that in non-NFSM district Allahabad maximum 80 per cent of the sample farmers reported lack of improved varieties and low yield as major problems and ranked 1 and 2. About 60 per cent and 76 per cent of the farmers told the problems of lack of irrigation facilities large doses of other inputs and no assured way for destroying pulses and ranked third, fourth and fifth ranks respectively in this district. Thus, major problems were lack of I.V. and low yield in non-NFSM district Allahabad.

VI:9: Important suggestions

Important suggestions from the farmers for pulses cultivation in NFSM district are given in table-VI-19 and table-VI-19(a) as follows:

Table-VI-19

Important Suggestion from the Farmers for Cultivating Pulses in NFSM Lalitpur District (2008-09)

(In Nos.)

Reasons	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Improving irrigation facilities	--	--	35	15	5	--	50
Availability of high yielding varieties	40	10	--	--	--	--	50
Availability of pest resistant varieties	--	--	15	35	5	--	50
Assured procurement with MSP	--	--	--	--	40	--	50
High market price	10	40	--	--	--	--	50
Any other	--	--	--	--	--	50	50
Total	50	50	50	50	50	50	300

Table-VI-19(a)
% Distribution of Important Suggestions from the Farmers for Cultivating Pulses in
NFSM Lalitpur District (2008-09)

(In %)

Reasons	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Improving irrigation facilities	--	--	70.00	30.00	10.00	--	100
Availability of high yielding varieties	80.00	20.00	--	--	--	--	100
Availability of pest resistant varieties	--	--	30.00	70.00	10.00	--	100
Assured procurement with MSP	--	--	--	--	80.00	--	100
High market price	20.00	80.00	--	--	--	--	100
Any other	--	--	--	--	--	100.00	100
Total	100.00	100.00	100.00	100.00	100.00	100.00	100

Table-VI-19 and table-VI-19(a) reveals that in NFSM district Lalitpur the main suggestion ranked first by 80 per cent of the farmers was availability of high yielding varieties to the farmers and ranked 2 by 20 per cent of the farmers. The market price ranked by 80 per cent of the farmers, high market price for pulses ranked 1 by 20 per cent of the farmers and was ranked 3 by 70 per cent improving irrigation facilities for pulses and 30 per cent of farmers reported availability of pest resistance varieties and ranked 3 assured procurement of pulses production with MSP and availability of pest resistance varieties problems were the suggestion ranked 5 by 80 per cent and 20 per cent of farmers respectively. 100 per cent of the farmers reported controlling blue-cow as problem and ranked 6.

Table-VI-20

Important Suggestion from the Farmers for Cultivating Pulses in Non NFSM District Allahabad

(In Nos.)

Reasons	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Improving irrigation facilities	38	6	6	--	--	--	50
Availability of high yielding varieties	8	20	12	--	--	10	50
Availability of pest resistant varieties	--	--	--	36	14	--	50
Assured procurement with MSP	--	--	--	14	36	--	50
High market price	4	24	22	--	--	--	50
Any other	--	--	10	--	--	40	50
Total	50	50	50	50	50	50	300

Table-VI-20(a)
% Distribution of Important Suggestions from the Farmers for Cultivating Pulses in
Non NFSM District Allahabad

(In %)

Reasons	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Improving irrigation facilities	76.00	12.00	12.00	--	--	--	100
Availability of high yielding varieties	16.00	40.00	24.00	--	--	20.00	100
Availability of pest resistant varieties	--	--	--	72.00	28.00	--	100
Assured procurement with MSP	--	--	--	28.00	72.00	--	100
High market price	8.00	48.00	44.00	--	--	--	100
Any other	--	--	20.00	--	--	80.00	100
Total	16.67	16.67	16.67	16.67	16.66	16.66	100

Table-VI-20 and VI-20(a) reveal that in non-NFSM district Allahabad the main suggestion ranked first by 76 per cent of the farmers was improving irrigation facilities for pulses. High market price was the suggestion ranked second and third by 48 per cent and 44 per cent of farmers respectively. 76 per cent of the farmers reported availability of pest resistant problems. Assured procurement MSP and any other problems were reported by 72 per cent and 80 per cent of farmers and ranked fifth and six respectively. Thus, improving irrigation was the major problem in this district.

VI:10: Whether farmers are willing to grow more pulses if government provides assured procurement

The perception of the sample farmers drawn from the NFSM district Lalitpur and Non-NFSM district Allahabad were also ascertained with respect to their willingness to grow pulses if assured market is provided and the reported responses are presented in table-VI-21

Table-VI-21

**Farmers Willing to Grow Pulses if Assured Market is Provided in NFSM District
Lalitpur and Non-NFSM District Allahabad**

	NFSM Lalitpur district			Non-NFSM Allahabad district		
	No. of Farmers Willing	Total No. of Farmers in the Size Groups	% of Farmers Willing	No. of Farmers Willing	Total No. of Farmers in the Size Group	% of Farmers Willing
Marginal	8	8	100.00	6	6	100.00
Small	27	27	100.00	6	6	100.00
Medium	15	15	100.00	37	37	100.00
Large	--	--	--	1	1	--
Total	50	50	100.00	50	50	100.00

Table-VI-21 reveals that 100 per cent of sample farmers of both the selected districts were willing to grow more pulses if government provides assured procurement in their areas.

Chapter-VII

IMPACT OF NFSM-PULSES ON PULSES PRODUCTION

An attempt has been made in this chapter to analyse the impact of NFSM on pulses farming of selected farmers of Lalitpur district during 2008-09.

7.1 Awareness about the NFSM

The perception of sample farmers about the awareness of NFSM programme is shown in Table-VII-1 which reveals that 90 per cent of the sample farmers of Lalitpur district were aware of NFSM pulses.

Table-VII-1
Farmers Awareness of: NFSM Pulses in District Lalitpur 2008-09

Groups	No. of HHLDS Aware	Total No. of HHLDS in the Size Group	% of HHLDS Aware
Marginal	7	8	87.50
Small	25	27	92.59
Medium	13	15	86.67
Large	--	--	--
Total	45	50	90.00

7.2 Assistance received and type of Assistance

The details of assistance received by the selected farmers under NFSM are shown in Table-VII-2 and VII-3. Table-VII-2 shows that out of 50 sample farmers, only 32 sample farmers (64%) had received the assistance under NFSM during 2008-09.

Table- VII-2
Received any Assistance under NFSM Pulses in District Lalitpur (2008-09)

Groups	No. of HHLDS who Received Assistance	Total No. of HHLDS in the Size Group	% of HHLDS Assisted
Marginal	4	8	50.00
Small	18	27	66.66
Medium	10	15	66.67
Large	--	--	--
Total	32	50	64.00

The distribution by type of assistance among the sample farmers are presented in Table- VII-3. Seeds INM, IPM, equipments, training etc were main assistances which had been provided to the sample farmers under NFSM. Among these assistances seed was main component followed by the training and equipments. None of the sample farmers had received assistance on Integrated Nutrient Management (INM) and Integrated Pest Management (IPM) under NFSM during the reference year. It is also evident from table- VII.3 that 21.86 per cent received assistance on seed followed by 15.65 per cent and 15.62 per cent on training and seed drill respectively under NFSM during 2008-09.

Table –VII-3
Distribution by Type of Assistance in District Lalitpur

No. of HHLDS Assisted								
Groups	Seeds	INM	IPM	Equipment Like Seed Drills etc.	Demons-tration	Training	Other	Total
Marginal	--	--	--	1	--	1	4	4
Small	5	1	--	2	-	2	18	18
Medium	2	1	--	2	-	2	10	10
Large	--	--	--	--	-	--	--	--
Total	7	2	--	5	-	5	32	32
% of Farmers Assisted to Total Farmers in Size Group								
Groups	Seeds	INM	IPM	Equipment Like Seed Drills etc.	Demonst-ration	Training	Other	Total
Marginal	-	-	-	25.00	-	25.00	100.00	100.00
Small	27.78	5.56	-	11.11	-	11.11	100.00	100.00
Medium	20.00	10.00	-	20.00	-	20.00	100.00	100.00
Large	-	-	-	-	-	-	-	--
Total	21.86	6.25	-	15.62	-	15.65	64.00	100.00

7.3 Whether the assistance received is useful and in what way?

The majority of sample farmers excepting farmers of small size-groups mentioned that assistance received under NFSM was useful in increasing the yield of pulses. The response of those supplied seed under NFSM was quite encouraging to boost the productivity of pulses. The training and distribution of literature etc. were also very much useful in adoption of new techniques in pulse crops. The small farmers were more benefited than other categories of sample farmers.

Table-VII-4
Usefulness of NFSM Pulses in District Lalitpur

Groups	No. of HHLDS who Found Useful	Total No. of HHLDS in the Size Group	% of HHLDS
Marginal	4	8	50.00
Small	8	27	29.63
Medium	10	15	66.67
Large	-	--	-
Total	32	50	64.00

Table-VII-5
Distribution by Type of Use in District Lalitpur

No. of HHLDS by Type of Use						
Groups	Higher Yield	Reduced Pest Attacks	Reduced Drudgery	Increased Knowledge	Other	Total
Marginal	--	--	--	4	--	4
Small	5	2	--	18	--	18
Medium	2	1	--	10	--	10
Large	--	--	--	--	--	--
Total	7	3	--	32	--	32
% of HHLDS to Total HHLDS in Size Group						
Groups	Higher Yield	Reduced Pest Attacks	Reduced Drudgery	Increased Knowledge	Other	Total
Marginal	--	--	--	100.00	--	100.00
Small	27.78	11.11	--	100.00	--	100.00
Medium	20.00	10.00	--	100.00	--	100.00
Large	--	--	--	--	--	--
Total	21.86	9.38	--	100.00	--	100.00

Area under Pulses before and after NFSM

The impact of NFSM on area under pulses in 2008-09 as compared to average area of 2006-07 and 2008-09 is presented in Table-VII-6. Table-VII-6 shows that overall area under pulses has increased by 1.59 per cent in 2008-09 as compared to average area of 2006-07 and 2007-08. It is also noticed from table-VII-6 that overall area under pea has increased by 3.49 per cent in 2008-09 as compared to average area of 2006-07 and 2007-08 followed by 0.66 per cent in case of urd during the corresponding period while the area under moong has decreased by 3.11 per cent during the same period.

Table- VII-6
Area under Pulse Crops before and After NFSM in District Lalitpur
(As Calculated from Schedule)

Group	Pulse Crop Urd			Pulse Crop Moong			Pulse Crop Pea		
	Average of 2006-07 and 2007-08	2008-09	Increase in percent	Average of 2006-07 and 2007-08	2008-09	Increase in percent	Average of 2006-07 and 2007-08	2008-09	Increase in percent
Marginal	5.92	6.10	3.04	--	--	--	4.00	4.55	13.75
Small	34.55	34.75	0.58	0.30	0.30	0.00	19.35	20.70	6.98
Medium	52.57	52.80	0.44	7.75	7.50	- 3.23	42.60	43.00	0.94
Large	--	--	--	--	--	--	--	--	--
Total	93.04	93.65	0.66	8.05	7.80	- 3.11	65.95	68.25	3.49

It is also evident from Table-VII-6 that all categories of sample farmers had expanded the area under urd and pea during 2008-09. It shows that impact of NFSM was positive in increasing the area under urd and pea across the sample size of farms.

The impact of NFSM on production of pulses in 2008-09 as compared to average production of 2006-07 and 2007-08 is presented in Table-VII-7 which indicates that overall production of pulses on the sample farms has increased by 7.25 per cent in 2008-09 as compared to average production of 2006-07 and 2007-08. Table-VII-7 also reveals that overall production of pea has increased by 10.41 per cent in 2008-09 as compared to average production of 2006-07 and 2007-08 while the production of urd has increased by 6.06 per cent in 2008-09 as compared to average production of 2006-07 and 2007-08. The production of pea as well as urd has significantly

increased across the sample size of farms. However, the small sample farmers were more benefited than other categories of sample farmers under NFSM in district Lalitpur.

Table-VII-7
Production of Pulse Crops Before and After NFSM in District Lalitpur
 (As Calculated from Schedule)

Groups	Pulse Crop Urd			Pulse Crop Moong			Pulse Crop Pea		
	Average of 2006-07 and 2007-08	2008-09	Increase in percent	Average of 2006-07 and 2007-08	2008-09	Increase in percent	Average of 2006-07 and 2007-08	2008-09	Increase in percent
Marginal	49.65	55.45	11.68	--	--	--	84.30	100.30	18.98
Small	340.30	366.62	7.73	3.00	3.00	0.00	315.15	378.70	30.16
Medium	531.35	555.05	4.46	87.00	86.00	- 1.16	640.07	668.70	4.47
Large	--	--	55.82	--	--	--	--	--	--
Total	921.30	977.12	6.06	90.00	89.00	- 1.12	1039.52	1147.70	10.41

7.4 Increase in Area under Pulses before and after NFSM as per farmer's Perception

Area under pulses before and after NFSM on the sample farms is shown in Table-VII-8. Table-VII-8 shows that out of 50 sample farmers, only 16 per cent sample farmers had increased area under pulses after NFSM. It shows that majority of sample farmers had not increased the area under pulses after NFSM. Of the 27 small sample farmers, only 7 sample farmers had increased area under pulses followed by 12.50 per cent of 8 marginal sample farmers after NFSM. None of medium size of sample farmers had increased the area under pulses after NFSM.

Table-VII-8
Increase in Area Under Pulses After NFSM: Farmers Perception in District Lalitpur

Groups	No. of HHLDS who Reporting Increase	Total No. of HHLDS in the Size Group	% of Farmers
Marginal	1	8	12.50
Small	7	27	25.93
Medium	--	15	--
Large	--	--	--
Total	8	50	16.00

The distribution by extent of increase in area under pulses is given in Table-VII-9. It is evident from table-VII-9 that small sample farmers had increased the area under pulses by 25.93 per cent followed by 12.50 per cent by marginal sample farmers after NFSM. It reflects that increase in area under pulses on the sample farms was not so encouraging after NFSM in district Lalitpur.

Table-VII-9
Distribution by Extent of Increase: Farmer's Perception

No. of HHLDS by Type of Use					
Groups	1% - 2%	2% - 5%	5% - 10%	> 10%	Total
Marginal	--	--	--	1	8
Small	--	--	--	7	27
Medium	--	--	--	--	15
Large	--	--	--	--	--
Total	--	--	--	8	50
% of HHLDS to Total HHLDS in Size Group					
Groups	1% - 2%	2% - 5%	5% - 10%	> 10%	Total
Marginal	--	--	--	12.50	100.00
Small	--	--	--	25.93	100.00
Medium	--	--	--	--	--
Large	--	--	--	--	--
Total	--	--	--	16.00	100.00

Major Suggestions from farmers for Improving NFSM Pulses

The following suggestions were obtained from sample farmers of NFSM of Lalitpur district during the field survey in improving the NFSM pulses in years to come.

1. The certified seed of pulses should be timely available at reasonable price.
2. The certified seed should be suitable according to soil health and climatic condition for specific areas.
3. The Rhizobium culture must be supplied along with certified seed of pulses to create more awareness to devote adequate area under pulses.
4. The assistance of integrated nutrient management (INM) and integrated Pest Management (IPM) should be provided to pulses growers to protect the pulses from attack of the diseases and insect/pests.
5. Training and demonstration under NFSM should be promoted and propagated in large scale in the remote villages of Lalitpur district.
6. The staff under NFSM is inadequate in number to properly implement the NFSM across the district. Therefore, it is suggested to appoint at least two staff at a block level for the proper execution of NFSM in villages.
7. Since the growing belts of pulses in Uttar Pradesh are unirrigated, therefore, short duration varieties of pulses should be propagated to get quick yield.
8. Subsidy on seeds, equipments etc should be increased for the promotion of NFSM.
9. Menace of the blue bull is one of the biggest problems of pulse growers across the state. Hence, the central and state governments should frame out a concrete strategy to protect the pulse crops from attack of blue bull.
10. The price of certified seed of pulses at government shops was much higher than the general shops. Therefore, price of certified seed of pulses should be same at different supplying agencies. This would enable the farmers to purchase more quantity of certified seed for leading to substitution of traditional varieties.
11. There is also need to increase the MSP of pulses to attract the farmers to devote more area under pulse crops.

12. Since the pulses are more risky and much susceptible to pests and insects, therefore, each pulse crop should be covered under crop insurance scheme to devote area under pulses without any fear.
13. There should be an integrated approach in promotion of NFSM across the state. In this context KVKs, SAUs and IIPR should make coordinated efforts to make success NFSM across the state.
14. For the popularization of summer pulses, the irrigation net-work in Lalitpur district should be expanded through watershed and water harvesting system.
15. Since the small and marginal farmers have less capacity to store the pulses in their houses due to lack of scientific storage containers, hence, the scientific storage containers should be given to farmers on subsidy price to store the grains of pulses for a long period. This would also avoid distress sale and protect huge losses in stored grains of pulses.
16. The dissemination of scientific package of practices of pulses is not being properly done in remote villages across the state. It is suggested that the extension agencies to make them more active and vigilant in the dissemination of scientific package of practices of pulses at grass root level. This would create more awareness among the farmers to devote more area under pulses. This would also increase the production of pulses.

CHAPTER -VIII

SUMMARY, CONCLUSION AND POLICY IMPLICATIONS

8.1. Introduction:-

Although cultivation of Pulses holds an important place in the farming systems of India, the production of pulses lags much behind the increasing demand of pulses by the peoples. The share of pulses in the production of total foodgrains has declined continuously, resulting in the reduction of the net availability of pulses from 60 gms per day per capita during 1950-51 to 31 gms per day per capita in 2007-08 against the recommended level of 80 gms per day per capita by F.A.O./W.H.O. and 43 gms per day per capita by I.C.M.R. This trend was due to dismal production performance of pulses in comparison to population growth. The country was compelled to import pulses due to acute shortfall in supply. This occurred despite the fact that several pulses development programmes were initiated in the past to meet-out the increasing demand of pulses due to continuously increasing population in the country. These programmes hardly led to any improvement in the pulses production of India. In order to raise pulses production by 2 million tones till the end of 2011-12, the existing all pulses programmes were replaced by NFSM-Pulses programmes.

In the country as a whole although NFSM has been launched for Rice, Wheat and Pulses, the largest numbers of district i.e. 171 are included under NFSM-Pulses mainly because of the fact that the production of pulses has remained stagnated in India for the last more than four decades in spite of India being the largest producer and consumer of pulses.

As regards the state of Uttar Pradesh, it ranks first in the production of total foodgrains, wheat, potato, vegetables, sugarcane as well as milk and second in the production of pulses as well as rice in the country. Thus, this state has the capacity to meet the challenges of livelihood security of not its own but the whole country. In this state as a whole the action plan under the National Food Security Mission has been implemented under three district components i.e. (1) National Food Security Mission – Rice (26 districts), (2) National Food Security Mission – Wheat (38 districts) and (3) National Food Security Mission – Pulses (19 districts). Among the 19 district undertaken under NFSM – Pulses, Lalitpur is such a district in which the area under pulses

increased from 2.02 lakh hectares during 2006-07 to 2.87 lakh hectares in 2009-10. Also out of these 19 districts, 7 districts fall in Bundelkhand region, 5 districts in Eastern region, 4 districts in Western region and only 3 districts in Central region of the state of Uttar Pradesh.

The main constraints in pulses cultivation in this state are low yield levels, stagnation in production technology, cultivation of pulses only on marginal lands, volatility of prices and ineffective procurement. This study, therefore, attempted to assess the degree of importance of these constraints and outline the prospects for pulses production in the state of Uttar Pradesh. This study also intended to assess the effectiveness of NFSM-Pulses on the pulses production in Uttar Pradesh.

8.2. Objectives of the Study:

The main objectives of this study were as follows:-

1. To analyze returns from cultivation of pulses vis-à-vis competing crops.
2. To analyze the other major problems and prospects for pulses cultivation.
3. To assess the impact, if any, of NFSM – Pulses.

8.3. Methodology:-

This study was confined to the state of Uttar Pradesh as a whole. A multistage stratified mixed sampling technique was used to choose the samples. One district each from NFSM and Non-NFSM groups were undertaken purposively on the basis of maximum area under pulses. From NFSM-Pulses group Lalitpur and from Non-NFSM group Allahabad district were undertaken. Two blocks one each from the districts thus, undertaken were chosen on the same criteria. Such blocks were Jhakhora from Lalitpur (NFSM-District) and Shankargarh from Allahabad (Non-NFSM-District). Thereafter, two villages one each from the blocks thus, chosen were selected on the same criteria. These villages were namely Sirsi from Jhakhora block of Lalitpur district and Gorialonipal from Shankargarh block of Allahabad district. From the two villages thus, chosen separate lists of pulses growers were obtained. These lists were further categorized into 4 size-

groups i.e. (1) Marginal Farmers (upto 1 ha), (2) Small Farmers (1 – 2 ha.), (3) Medium Farmers (2 – 4 ha) and (4) Large Farmers (Above 4 ha). From these lists the ultimate samples were undertaken according to probability proportion to the total number in each size group restricting the number of samples to 50 in each of both the groups making the samples in total 100 for in depth study. The reference period for this study was agricultural years from 2006-07 to 2008-09.

8.4. Main Findings:-

8.4.1. Status of Pulses Sector in Uttar Pradesh.

8.4.1.1. Area Under Important Crops:-

The crop-wise distribution of area in the state of U.P. shows that the maximum i.e. 78.69 per cent of the gross cropped area was covered by foodgrain crops only including pulses sharing 9.85 per cent, sugarcane covered 8.36 per cent and cotton only 0.02 per cent of the G.C.A. Thus, it is obvious that foodgrain crops are given much importance in Uttar Pradesh and among foodgrains Wheat as well as Rice have been given important places in gross cropped area. Pulses have also covered considerably i.e. about 10 per cent of the gross cropped area of the state.

8.4.1.2. Growth Trends of Important Crops:-

The annual increase in gross cropped area was 0.19 per cent, while total production declined at the annual rate of – 0.21 per cent and as such the average yield declined at the annual rate of – 1.09 per cent in the state of Uttar Pradesh. Thus, it is safely concluded that a scanty increase in gross cropped area of the state had not affected the total production as well as yield in U.P. during 1996-97 to 2007-08. The crop-wise analysis shows that the area under cotton, oilseeds, pulses and maize had declined and the area under sugarcane, rice, wheat and bajra had increased in the state of U.P. Regarding production and yield of important crops it was found that the decline in few crops had dominated the increases in few crops and as such the production and yield had declined in the state of Uttar Pradesh during the span of 1996-97 to 2007-08.

8.4.1.3. Growth of Important Variables i.e. N.S.A., G.C.A., N.I.A., G.I.A. and Fertilizer Consumption etc in Uttar Pradesh:-

The annual decline in N.S.A. was estimated at the rate of – 0.51 per cent during the span of 1996-97 to 2007-08 in U.P. The annual decline in G.C.A. too was estimated at the rate of – 0.20 per cent during the same span of period. The annual increase in N.I.A. in the state of U.P. was estimated at the rate of 1.03 per cent during the same period and the annual increase in G.I.A. was estimated at the rate of 1.13 per cent during 1996-97 to 2007-08. While the increases in the share of N.I.A. in the N.S.A. of the state of U.P. was found to be increased from 6.9 per cent during 1996-97 to 8.1 per cent till the year 2007-08 with an annual growth rate of 1.47 per cent during the same span of period. But the increase in the share of G.I.A. in G.C.A. was found to be increased from 6.6 per cent during 1996-97 to 7.7 per cent till 2007-08 with an annual growth of 1.42 per cent in the span of period.

The annual increase in the Fertilizer consumption was estimated at the rate of 2.49 per cent during the same period. While the per hectare analysis indicates that the annual increase in the per hectare fertilizer consumption was estimated at the rate of 2.76 per cent during the same years.

8.4.1.4. Area Under Pulses in Uttar Pradesh:-

Gram and Lentil (Masoor) were found to cover about half of the total area under pulses in the state of U.P. Urd, Arhar as well as Pea were also found to cover a considerable area of the total coverage under pulses in the state. The area under Moong was reported to be minimum i.e. 2.69 per cent in this state. Thus, Lentil was next important pulse crop after the Gram in this state.

8.4.1.5. Area, Production and Yield of Pulses in the State of Uttar Pradesh:-

8.4.1.5(a). Area, Production, Yield and Irrigated Area under Urd in Uttar Pradesh During 1996-97 to 2007-08 :-

The growth in the area of Urd was negligible in a zig-zag manner in the state of Uttar Pradesh. The production of Urd had increased with an annual growth rate of 3.87 per cent. This clarifies well that growth in the production of Urd in the state of U.P. was considerable during the years 1996-97 to 2007-08. The average annual rate of growth in the yield of urd during 1996-97 to 2007-08 was estimated as 2.51 per cent only in the state as a whole. Thus, the yield of urd was discouraging and more or less stagnated in the state of U.P. The irrigated area under urd was decreased with an annual decrease at the rate of – 2.05 per cent during the same span of period. Thus, the irrigated area of urd in the state as a whole decreased gradually with minor ups and downs during 1996-97 to 2007-08.

8.4.1.5(b). Area, Production, Yield and Irrigated Area under Moong in Uttar Pradesh During 1996-97 to 2007-08:-

The area under Moong decreased continuously with an annual decrease at the rate of – 5.60 per cent in this state. Thus, it is obviously clarified that in the state as a whole there was tremendous decrease in the area of Moong during 1996-97 to 2007-08. The production of Moong decreased with an annual decrease at the rate of – 2.53 per cent during the same span of period. Thus, production of Moong was also much discouraging in the state of U.P. While the annual increase in yield of Moong in this state was estimated at the rate of 3.25 per cent. Thus, the growth in yield of Moong was satisfactory beyond the discouraging performance of area as well as production of Moong in this state. The decrease in irrigated area of Moong was estimated at an annual decrease rate of – 8.56 per cent. Thus, irrigated area under Moong decreased continuously with a faster pace in the same span of period.

8.4.1.5(c). Area, Production, Yield and Irrigated Area under Arhar in Uttar Pradesh During 1996-97 to 2007-08:-

The area under Arhar decreased with an annual decrease at the rate of – 3.16 per cent. Thus, the decrease in the area under Arhar was obviously considerable in the state of U.P. Accordingly the decrease in the production of Arhar was estimated with an annual decrease at the rate of – 4.23 per cent in the state. Thus, the production of Arhar decreased tremendously after 1998-99. The yield of Arhar previously increased till 1998-99. But thereafter decreased with an annual decrease rate of – 1.10 per cent. Thus, the yield of Arhar also decreased considerably in this state during the same period. While the irrigated area under Arhar decreased continuously with ups and downs during 1996-97 to 2007-08 in this state. Thus, it is safely concluded that the area, production, yield and irrigated area under Arhar decreased discouragingly in state of U.P. during 1996-97 to 2007-08.

8.4.1.5(d). Area, Production, Yield and Irrigated Area under Lentil (Masoor) in Uttar Pradesh During 1996-97 to 2007-08:-

The area under Lentil firstly increased till the year 1999-2000 but thereafter it decreased with an annual decrease at the rate of – 2.06 per cent during the same years. Thus, there was a considerable decrease in the area of Lentil in this state. The production of Lentil firstly increased till 2003-04 with ups and downs but thereafter decreased at an annual rate of – 1.76 per cent. Thus, production of lentil also decreased marginally in the state during the same span of period. While the yield of Lentil increased with ups and downs at an annual marginal increase at the rate of 0.31 per cent in this state. Thus, the yield of Lentil increased marginally in the state during the same span of period. The irrigated area under Lentil also increased considerably at an annual rate of 1.54 per cent during the same span of period.

8.4.1.5(e). Area, Production, Yield and Irrigated Area under Gram in Uttar Pradesh
During 1996-97 to 2007-08:-

The area under Gram decreased with an annual decrease at the rate of – 0.57 per cent in this state during 1996-97 to 2007-08. Thus, the area under Gram decreased marginally in the state of U.P. The production of Gram firstly increased till 2000-01. But thereafter, it decreased with an annual decrease at the rate of – 2.41 per cent in this state. Thus, the production of Gram decreased considerably in the state during the same span of period. The yield of Gram increased considerably in the state estimating slightly highest i.e. 10.37 quintal per hectare in 2002-03. Thus, yield of Gram increased considerably in this state during 1996-97 to 2007-08. The irrigated area under Gram increased with an annual increase at the rate of 2.95 per cent during the same span of period. Thus, irrigated area under Gram increased considerably in the state during 1996-97 to 2007-08.

8.4.1.5(f). Area, Production, Yield and Irrigated Area under Pea in Uttar Pradesh
During 1996-97 to 2007-08 :-

The area under Pea decreased with an annual decrease at the rate of – 3.02 per cent during 1996-97 to 2007-08 in U.P. Thus, there was a tremendous decrease in the area under Pea during the same span of period. The production of Pea also decreased varying with ups and downs with an annual decrease at the rate of – 1.41 per cent. Thus, the decrease in the production of Pea was also considerable in the state during same span of period. But the yield of Pea inspite of reduction in area as well as production was found to be increased at a considerable rate of 1.65 per cent during 1996-97 to 2007-08. The irrigated area under Pea decreased with ups and downs with an annual decrease at the rate of – 1.99 per cent during the span of 1996-97 to 2007-08 in the state of Uttar Pradesh.

8.4.1.6. CAGR Over 1996-97 to 2007-08 for A.P.Y. of Important Pulses in Main Districts of Uttar Pradesh:-

8.4.1.6(I). CAGR Over 1996-97 to 2007-08 for A.P.Y. of Urd in Main Districts of Uttar Pradesh:-

The faster increase in the area of Urd in Mahoba and Lalitpur districts dominated the decrease in the area of urd in Hamirpur, Allahabad and Fatehpur Districts and converted the area under urd to be increased considerably in the state of U.P. Regarding production it was found that the overall increase in the production of urd in this state was faster at the rate of 4.78 per cent during the span of 1996-97 to 2007-08. The yield of urd accordingly increased in the state at a considerable rate of 1.46 per cent. Among the districts the increase in yield of urd was fastest at the rate of 14.08 per cent against the lowest at the rate of 0.24 per cent in Allahabad district.

8.4.1.6(II). CAGR Over 1996-97 to 2007-08 for A.P.Y. of Moong in Main Districts of Uttar Pradesh:-

The increase in few districts was balanced by the decrease in few districts and as such it resulted in the increase in the area of Moong to be marginal in this state as a whole. Accordingly the production of Moong was also found to be increased marginally at the rate of 0.75 per cent. The position of districts was similar as was in case of area of Moong. Thus, production of Moong increased marginally in the state as whole. The yield of Moong decreased at the highest rate of – 5.82 per cent in Hamirpur and increased at the highest rate of 2.19 per cent in Banda district. Thus, the increase in the yield of Moong was also found to be quite negligible in the state of U.P. during 1996-97 to 2007-08.

8.4.1.6(III). CAGR Over 1996-97 to 2007-08 for A.P.Y. of Arhar in Main Districts of Uttar Pradesh:-

The highest decrease in the area of Arhar was estimated at the rate of – 12.89 per cent in Jhansi district against the lowest i.e. – 0.28 per cent in Fatehpur district. Thus, the decrease in the area

under Arhar was tremendous in the state as a whole during 1996-97 to 2007-08. Accordingly the production of Arhar also decreased tremendously at the rate of – 7.92 per cent. Yield of Arhar also decreased at the rate of – 4.85 per cent. Thus, the yield of Arhar too decreased tremendously in this state during 1996-97 to 2007-08.

8.4.1.6(IV). CAGR Over 1996-97 to 2007-08 for A.P.Y. of Gram in Main Districts of Uttar Pradesh:-

The area under Gram also decreased tremendously at the rate of – 3.34 per cent in this state. The production of Gram also decreased at the rate of – 0.05 per cent in the state as a whole. Among the districts the highest decrease at the rate of 9.06 per cent in Allahabad and highest increase at the rate 18.12 per cent in Banda district were estimated in this state. Thus, production of Gram decreased marginally in this state. While the yield of Gram increased marginally in the state of U.P. during 1996-97 to 2007-08.

8.4.1.6(V). CAGR Over 1996-97 to 2007-08 for A.P.Y. of Pea in Main Districts of Uttar Pradesh:-

The increase in the area of Pea dominated the decrease in the area of Pea. Thus, it was safely concluded that the area under Pea increased considerably in the state during 1996-97 to 2007-08. The production of Pea also increased considerably dominating the decrease in the production of Pea in this state. While the yield of Pea decreased marginally in this state during the same span of period. The rate of decrease was estimated as – 0.22 per cent in the state as a whole.

8.4.1.6(VI). CAGR Over 1996-97 to 2007-08 for A.P.Y. of Masoor in Main Districts of Uttar Pradesh:-

The increase in the area of Masoor in the state of U.P. was found to be considerable on an overall. While the production of Masoor decreased marginally as the increase in few districts was dominated by decrease in few districts resulting in the decrease at the rate of – 0.09 per cent

in this state. The yield of Masoor also decreased at the rate of – 1.09 per cent and as such the yield of Masoor decreased marginally in this state during the same span of period.

8.4.2. Demographic Profile and Cropping Pattern of the Study Region

8.4.2.1. General Overview of Sample Farmers of NFSM District Lalitpur:-

The number of males was higher than females and there was no large farmers in this district. The number of illiterates was higher among small and medium farmers against the higher literacy witnessed among marginal farmers particularly adult members. Regarding castes this study reflects that SCs and OBCs were dominant castes among sample farmers.

8.4.2.2. Crop-Structural Components in NFSM Lalitpur District:-

This study reveals that pulses were main crops across size of farms and no rice crop was grown on any of sample farms. Zaid crops were not at all grown in this district and the variation in cropping pattern on different size of farms was marginal. Urd and Pea were the main pulses. Moong was not at all grown by marginal farmers. As the growth in area of pulses was only 2.13 per cent over the period, hence it was concluded that area under pulses on various size of farms was more or less stagnant.

8.4.2.3. Irrigation Resources in NFSM Lalitpur District:-

The analysis in table-III-20 indicate that the maximum of cultivated area was found to be irrigated by canal. Urd and Moong were not at all irrigated by sample farmers, while Pea was fully irrigated by sample farmers of all the size-groups in this district.

8.4.2.4. General Overview of Sample Farmers of Non-NFSM Allahabad District:-

In this district also the number of males was comparatively higher (52.66 per cent) against 47.34 per cent of the female members. As regards the castes there was preponderance of OBCs among the sample farmers. While SCs were centred among marginal sample farmers and general castes

were centralized among only medium sample farmers. Regarding education the sample farmers of marginal size-group were mostly illiterates. Among all the sample farmers generally they were well educated across the size of farms. The literacy was higher among adult members on medium large size of farms as none was illiterate among adult members of large sized farms.

8.4.2.5. Crop-Structural Components in Non-NFSM Allahabad District:-

In this district the area under cereals was higher i.e. 44.43 per cent of the gross cropped area and 41.96 per cent of the G.C.A. was under pulses. The share of area under pulses was found decreasing with the increase in the size of farms. This clearly reflects that marginal farmers had devoted more area under pulses in comparison to medium and large farmers. The area under Kharif crops was higher by 3.80 per cent over the area under Rabi crops. While among pulses in general the coverage under Rabi pulses was higher being 28 per cent of G.C.A. against 13.96 per cent covered under Kharif pulses. Among pulses Masoor was main crop covering 49.83 per cent of the area under total pulses.

8.4.2.6. Irrigation Resources in Non-NFSM Allahabad District:-

Canal and tube-wells were the main sources of irrigation across the size of farms. The irrigated area was found increasing with the increase in the size of farms. This clearly reflects that large farmers had better irrigation facilities in comparison of small and marginal farmers in the area under study. The share of irrigated area under pulses was found decreasing with the increase in the size of farms.

8.4.3. Economics of Pulses Cultivation

8.4.3.1. Economics of Individual Pulses Crops Cultivation in NFSM District Lalitpur:-

In case of Urd the increase in net return per hectare as well as per quintal was due to increase in productivity and price hike during 2006-07 to 2008-09. The gross return per hectare and per quintal had increasing trend on all the sample farms during 2006-07 to 2008-09 in NFSM district

Lalitpur. While the increase in net return per hectare and per quintal in case Moong due to price hike in 2008-09. The return was higher on medium farms as compared to the small farmers due to higher productivity. Thus, Moong was a profitable crop in the area under study. Pea was a popular pulse crop and return per hectare and per quintal had an increasing trend on the farms. Thus, it is concluded that Pea was most profitable crop in NFSM district Lalitpur.

8.4.3.1. Economics of Individual Pulses Crops Cultivation in Non-NFSM District Allahabad:-

In Allahabad district also urd was an important crop but the net return per hectare and per quintal had decreased on medium and large farms. The gross return decreased while the cost incurred increased. Thus, it is concluded that urd was not profitable crop in this district. In case of Arhar the return per hectare and per quintal was higher on medium farms in comparison of small farms during the study period. The gross return, paid out cost and net return had increasing trend. In case of Masoor also the paid out cost per hectare and per quintal was increasing continuously. Still the profitability of this crop was satisfactory across the size-groups of farms. Thus, it was a promising pulse crop on all the farms. The productivity of Gram on all the farms was decreased year after year and hence the return per hectare and per quintal had decreased in this district over the period of study. Thus, it is concluded that Gram was not profitable crop on the farms Allahabad during the study period.

8.4.4. Technology Adoption, Marketing and other Issues:-

8.4.4.1. Technology Adoption:-

The response of improved varieties of pulses in NFSM district Lalitpur was better as the area under improved varieties of important pulses was considerably higher. While in Non-NFSM district Allahabad the area under improved varieties of important pulses undertaken was discouraging except Masoor. This clearly indicates that effect of National Food Security Mission (2008) was not effective in Allahabad district as effective in NFSM district Lalitpur. Due to canal irrigation in Lalitpur district the area was shifted to Pea and other competing crops. Thus, response of NFSM was highly effective in this district. While in Non-NFSM district Allahabad the area under improved varieties were in case of Urd, Arhar and Gram only hence improved

technology was adopted in only a few important pulses in Non-NFSM district Allahabad. 100 per cent of sample farmers had knowledge about improved varieties of pulses. Thus, it is evidently clear that farmers of both the district were well aware about improved varieties of pulses. The main sources of knowledge about improved varieties of pulses in NFSM district Lalitpur were extension agents while in non-NFSM district Allahabad. The main sources of knowledge were the neighbors and there were no large farmers, hence NFSM was not effective in this district. Regarding recommended practices followed farmers of Lalitpur followed only sowing and seed practices. In Allahabad too sowing, seeds and other practices were followed. Thus, in both the district NFSM was ineffective in respects of recommended practices being followed. Regarding problems with improved varieties of important pulses it was reported that non-availability of seeds, untimely availability of seeds, seeds were very expensive and I.V. needed large doses of other inputs and much lower yield of pulses as well as inadequate pest resistance were the main problems in NFSM district Lalitpur. Similar problems were reported in non-NFSM district Allahabad too. As regards solution for problems of improved varieties of important pulses in NFSM district Lalitpur as well as non-NFSM district Allahabad it was reported that cheaper availability of improved variety seeds, timely availability of seeds, and increase in subsidy involved were suggested in both the district to be the main solutions.

8.4.4.2. Marketing Channels and Quantity of Pulses Marketed:-

In NFSM District Lalitpur apart from regulated markets some other marketing channels were also used by 54 per cent i.e. more than half of the sample farmers. While in non-NFSM district Allahabad marketing of pulses produced was quite unorganized which clarifies that NFSM (2008) was ineffective in Allahabad district. Regarding quantity of pulses marketed it was found that maximum amount of marketable surpluses was marketed through regulated markets in NFSM district Lalitpur. The larger quantity of urd was sold by small and medium farmers in this district while in non-NFSM district Allahabad the marketing of urd was negligible. The quantity of Moong in Lalitpur was sold through regulated markets by medium farmers. The quantity sold by other channels was negligible. In case of Arhar in non-NFSM district Allahabad the medium farmers were the main producers of pulses who had marketed surplus too. In case of Pea in NFSM district Lalitpur, the maximum quantity was sold by small and medium farmers. Thus,

role of regulated markets was significant and as such NFSM was effective in this district. In case of Masoor in non-NFSM district Allahabad the quantity sold by small and large farmers was also considerable. In case of Gram the quantity sold in Allahabad district was quite negligible and as such NFSM (2008) was not at all effective in this district.

8.4.4.3. Procurement of Pulses by Govt. (NAFED) from Farmers:-

In both NFSM and non-NFSM district the procurement by NAFED was nil. Thus, it is well clarified that in both the district no procurement was done by the government (NAFED).

8.4.5. Farmers Perceptions:-

8.4.5.1. Reasons for Growing Pulses:-

In NFSM district Lalitpur farmers were compelled to grow pulses because their soil was not suitable to grow other crops. Inferior quality of land was also a reason for growing pulses and lack of irrigation facilities was also reason in this district. In non-NFSM district Allahabad the main reasons were lack of irrigation, profitability and inferior quality of land.

8.4.5.2. Criteria used while Opting to Grow Pulses:-

In NFSM district Lalitpur soil suitability and inferior quality of land were the main criterias to grow pulses. Irregular rainfall was also a criteria in this district. While in non-NFSM district Allahabad soil suitability and inferior quality of land were the main criterias to grow pulses.

8.4.5.3. Reasons for Low Area Under Pulses:-

In Lalitpur district the main reason for low area under pulses were problems of pests, marketing and instability in production. In non-NFSM district Allahabad the main reason were pest problems and other problems.

8.4.5.4. Pulses and other Crops Grown on Inferior Quality of Land:-

In NFSM district Lalitpur farmers opined that they use to grow pulses and other crops on inferior land only. In non-NFSM district Allahabad also are grown on inferior quality of land only.

8.4.5.5. Problems of Growing Pulses on Inferior Quality of Land:-

In NFSM district Lalitpur the main problems were lower yield and poor grains quality. In non-NFSM district Allahabad also the same problems were told by the majority of farmers.

8.4.5.6. Reasons for Shifting from Pulses to Other Crops:-

In NFSM district Lalitpur the main reasons for shifts were low yield and prices, uncertain yield of improved varieties and lack of assured markets. In non-NFSM district Allahabad too the main reason was low yield and prices.

8.4.5.7. Major Problems:-

In NFSM district Lalitpur major pests were wilt, root-rot, pod borers and nematodes. The maximum loss was due to pod fly. In non-NFSM district Allahabad too the maximum loss in yield was due to pod fly.

8.4.5.8. Major Problems in Cultivating Pulses:-

In NFSM district Lalitpur the first major problems was lack of seeds of improved varieties of pulses, second was low yield and third was low market prices. In non-NFSM district Allahabad too the major problems were lack of seeds of improved varieties and low yield.

8.4.5.9. Important Suggestions:-

In NFSM district Lalitpur the main suggestion was availability of seeds of high yielding varieties of pulses. High market prices and better irrigation facilities were also suggested in this district. In non-NFSM district Allahabad farmers suggested for improving irrigation facilities and high marketed prices through M.S.P. and pest resistance.

8.4.5.10. Whether Farmers are Willing to Grow More Pulses if Government Provides the Assured Procurement:-

In both NFSM and non-NFSM districts the 100 per cent farmers were willing to grow more pulses if government provides assured procurement in their areas.

8.4.6. Impact of NFSM Pulses on Pulses Production:-

8.4.6.1. Awareness about the NFSM:-

About 90 per cent of the sample farmers of Lalitpur district were aware of the NFSM-Pulses.

8.4.6.2. Assistance Received and Type of Assistance:-

The analysis shows that about 64 per cent of the sample farmers had received assistance under NFSM during 2008-09. 22 per cent received assistance on seeds and 20 per cent demonstration and training under NFSM.

8.4.6.3. Whether Assistance Received is useful and in What Way?

The seed supply under NFSM was quite encouraging to boost productivity of pulses. Training and demonstration were useful in adoption of new techniques. Also small farmers were much benefited than other categories of farmers.

8.4.6.4. Area under Pulses Before and After NFSM:-

All the sample farmers have expanded their area under Pea and Urd. This clarifies that the impact of NFSM was positive in increasing the area under Urd and Pea across the size of farms.

8.4.6.5. Major Suggestions from Farmers for Improving NFSM-Pulses:-

1. Timely availability of suitable certified seeds of improved varieties with rhizobium culture.
2. Assistance from INM and IPM should be provided.
3. Training and demonstrations under NFSM must be promoted.
4. Subsidy on seeds and equipments must be increased.
5. MSP of all pulses must be increased.
6. Irrigation facilities must be increased to grow Zaid pulses too.

Suggestions and Policy Implications

Suggestions:

1. Adequate and timely availability of certified seeds of important pulses on subsidized rate must be assured by the Government.
2. Existing irrigation facilities must be extended particularly in the rainfed areas of the state.
3. Subsidy on other costly inputs such as machinery, implements, fertilizers and pesticides should be increased.
4. Sufficient assistance of I.N.M. and I.P.M. should be provided particularly to predominant pulses growers for boosting the yield of pulses.
5. Remunerative and assured M.S.P. (minimum support prices) must be fixed for various pulses.
6. Organization of more meetings with the farmers must be promoted to make them aware with NFSM for developing their interest in pulses cultivation.

7. An appropriate strong strategy must be framed to protect the pulses from attacks of blue-bulls which is a regular menace across the state.
8. Demonstrations and training programmes under NFSM must be promoted on large scale particularly in the remote areas of the state.
9. Some suitable short duration varieties of pulses should be propagated for the large unirrigated and rainfed area of the state.
10. More number of staff under NFSM must be increased across the state for proper implementation.

Policy Implications

1. Since Uttar Pradesh rank first in the production of total foodgrains, wheat, potato, vegetables, sugarcane as well as milk and second in the production of pulses as well as rice in India, it has the capacity to meet the challenges of livelihood security of not its own but of the whole country. This state can easily obtain first rank in the production of pulses as well as rice. Farmers are very much interested to grow more pulses as these have become profitable to cultivate them. But to bring it into practice the U.P. government must adopt such an agricultural policy which may emphasize more profoundly and provide assured markets for pulses. The first need would be to redesign the price-policy taking all the aspects into consideration such as cultivating pulses in lean and leap years, checking the price going down in case of bumper production and prices going up in case of crop failure.
2. Since this state has large rainfed and unirrigated area, government should arrange and encourage for developing suitable short duration varieties of high yielding seeds of pulses. Also the varieties tolerant to heat stress and drought must be developed. Varieties tolerant to the moisture stress should also be developed to bring more area under pulses in irrigated condition and check the shifting to other crops.
3. Subsidy provided under NFSM-Pulses on various inputs are scanty and based on old prices. Therefore, seeing the current price hike on all the inputs the amount of subsidy to be provided further should be increased accordingly by changing the policy to encourage the pulses growers.

4. Since the nature of existing varieties of pulses is of generally giving low productivity, the specific varieties of pulses should be developed by making sound agricultural policy for improving the genetic production potential of pulses in the country itself.
5. Across the state of Uttar Pradesh there is a regular menace of attack by blue-bulls particularly on pulses. Therefore, a sound policy should be framed to eradicate this problem from the whole state by making blue-bulls centuries or habitats.
6. Although shortage of labourers is not acute problem in the state. But during the peak seasons there happen some shortage merely due to implementation of NREGA scheme in the state. Therefore, government should find-out some proper solutions.
7. In the main pulses growing district the major problem faced by majority of farmers was attack of insects & pests on pulses during ripening particularly by pod boerer, pod fly rod-rot and wilt. Some sound policy should be framed by the assistance of Integrated Pest Management (I.P.M.) under NFSM-Pulses programme in the state as a whole.
8. For boosting the area, production and yield of pulses, some crop specific and area specific approaches should be developed by changing the existing agricultural policies in the country.

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Appendix – I

Comments on the Draft Report of Study on “Possibilities and Constraints in Increasing Pulses Production in Uttar Pradesh and the Impact of National Food Security Mission on Pulses”

Tables to be Completed by AER Centre, Allahabad

Please Refer to the tabulation scheme sent by IEG. Kindly adhere to that scheme to ensure uniformity with other reports.

Chapter No.	Table	Comments
Chapter – 3	Area under pulses all – seasonwise	Page No. 46, Table-III-18- Addition mistake.
Chapter – 4	Profitability of total Pulses Farming in Non-NFSM District Allahabad	The calculations are incorrect in some of the groups. Kindly recalculate.
Chapter – 4	Profitability of Total Major Crops Farming in NFSM District Lalitpur	The calculations are incorrect in some of the groups. Kindly recalculate.
Chapter – 4	Profitability of Total Major Crops Farming in Non-NFSM District Allahabad	The calculations are incorrect in some of the groups. Kindly recalculate.
Chapter – 5	Households reporting area under improved varieties pulsewise	Page No. 85 and Page No. 86 – Table-V-1(A) to V-2(b) have to be provided for each pulse crop separately size-groupwise
Chapter – 5	Quantity of Pulses Crop Sold through various channels	Page No. 107-Table-V-26, title-crop name is incorrect. There is no moong in Non-NFSM district. Please correct.
Chapter – 6	Reasons for low area under pulses	Page No. 114 - % mistake in Table-VI-7
Chapter – 7	Usefulness of NFSM	Page No. 128 – Table No. VII-4. Percentage calculation is incorrect.
Chapter – 7	Distribution by extent of increase: Farmer’s Perception	Compare tables VII-6 and VII-9 area increase is very less or negative in table-VII-6. Then how is it possible that all the farmers report more than 10% increase in area in Table-VII-9. Kindly explain.

Appendix – II

1. Date of Dispatch of draft Report 21/12/2011
2. Date of Report of Comment 21/02/2012
3. Date of Dispatch of Final Report 07/03/2012

Action Taken

Comments on the draft report of the study on “Possibilities and Constraints in Increasing Pulses Production in Uttar Pradesh and the Impact of National Food Security Mission on Pulses” by Prof. Ramendu Roy et. al., Study No. 134 Publication No. 181, Agro-Economic Research Centre, University of Allahabad, Allahabad, 2011 and suggestions received from the coordinator Dr. C.S.C. Sekhar, Associate Professor, Institute of Economic Growth, University of Delhi Enclave, Delhi-110 007, have been thoroughly seen and the comment-wise appropriate actions taken on the same are as follows:-

Comment-wise Actions Taken:-

Comments	Actions Taken
Comments – 1	The addition mistake on page 46 in Table-III-18 has been corrected in column total.
Comments – 2	The calculations in Table-IV-9 on page 67 are corrected and incorporated accordingly in the narration.
Comments – 3	The calculations in Table-IV-17 on page 78 are corrected and incorporated accordingly in the narration.
Comments – 4	The calculations in Table-IV-18 on page 80 are corrected and incorporated accordingly in the narration.
Comments – 5	Due to inconsistency of data for separate pulse crop in various size-groups, these 4 tables [V-1(a) to V-2(b)] were worked-out as presented for the area under Improved Varieties by the farmers. The separate pulse-wise analysis was not done.
Comments – 6	The typographical error in the heading of Table-V-26 has been corrected as Arhar instead of Moong on page 107 because in narration it is mentioned as Arhar.
Comments – 7	The percentage mistakes in Table-VI-7 on page 114 have been corrected and incorporated in the narration also.
Comments – 8	The incorrect percentage calculations in Table-VII-4 on page 128 has been corrected and incorporated in the narration accordingly.
Comments – 9	In Table-VII-6 the area under Urd as well as Pea is neither less nor negative in both before and after conditions. It is negative only in case of Moong. Also there is not a single farmer reported in large size group. Hence in Table-VII-9 when it is calculated on aggregate level for all the farmers it has come more than 10%. Is not it self explanatory?

Actions on comments are taken / prepared by Dr. Rajendra Singh only.
24/02/2012 and corrected on 02/03/2012

EXECUTIVE SUMMARY

Although cultivation of Pulses holds an important place in the farming systems of India, the production of pulses lags much behind the increasing demand of pulses by the peoples. The share of pulses in the production of total foodgrains has declined continuously, resulting in the reduction of the net availability of pulses from 60 gms per day per capita during 1950-51 to 31 gms per day per capita in 2007-08 against the recommended level of 80 gms per day per capita by F.A.O./W.H.O. and 43 gms per day per capita by I.C.M.R. This trend was due to dismal production performance of pulses in comparison to population growth. The country was compelled to import pulses due to acute shortfall in supply. This occurred despite the fact that several pulses development programmes were initiated in the past to meet-out the increasing demand of pulses due to continuously increasing population in the country. These programmes hardly led to any improvement in the pulses production of India. In order to raise pulses production by 2 million tones till the end of 2011-12, the existing all pulses programmes were replaced by NFSM-Pulses programmes.

In the country as a whole although NFSM has been launched for Rice, Wheat and Pulses, the largest numbers of district i.e. 171 are included under NFSM-Pulses mainly because of the fact that the production of pulses has remained stagnated in India for the last more than four decades in spite of India being the largest producer and consumer of pulses.

As regards the state of Uttar Pradesh, it ranks first in the production of total foodgrains, wheat, potato, vegetables, sugarcane as well as milk and second in the production of pulses as well as rice in the country. Thus, this state has the capacity to meet the challenges of livelihood security of not its own but the whole country. In this state as a whole the action plan under the National Food Security Mission has been implemented under three district components i.e. (1) National Food Security Mission – Rice (26 districts), (2) National Food Security Mission – Wheat (38 districts) and (3) National Food Security Mission – Pulses (19 districts). Among the 19 district undertaken under NFSM – Pulses, Lalitpur is such a district in which the area under pulses increased from 2.02 lakh hectares during 2006-07 to 2.87 lakh hectares in 2009-10. Also out of

these 19 districts, 7 districts fall in Bundelkhand region, 5 districts in Eastern region, 4 districts in Western region and only 3 districts in Central region of the state of Uttar Pradesh.

The main constraints in pulses cultivation in this state are low yield levels, stagnation in production technology, cultivation of pulses only on marginal lands, volatility of prices and ineffective procurement. This study, therefore, attempted to assess the degree of importance of these constraints and outline the prospects for pulses production in the state of Uttar Pradesh. This study also intended to assess the effectiveness of NFSM-Pulses on the pulses production in Uttar Pradesh.

Objectives of the Study:

The main objectives of this study were as follows:-

4. To analyze returns from cultivation of pulses vis-à-vis competing crops.
5. To analyze the other major problems and prospects for pulses cultivation.
6. To assess the impact, if any, of NFSM – Pulses.

Methodology:-

This study was confined to the state of Uttar Pradesh as a whole. A multistage stratified mixed sampling technique was used to choose the samples. One district each from NFSM and Non-NFSM groups were undertaken purposively on the basis of maximum area under pulses. From NFSM-Pulses group Lalitpur and from Non-NFSM group Allahabad district were undertaken. Two blocks one each from the districts thus, undertaken were chosen on the same criteria. Such blocks were Jhakhora from Lalitpur (NFSM-District) and Shankargarh from Allahabad (Non-NFSM-District). Thereafter, two villages one each from the blocks thus, chosen were selected on the same criteria. These villages were namely Sirsi from Jhakhora block of Lalitpur district and Gorialonipal from Shankargarh block of Allahabad district. From the two villages thus, chosen separate lists of pulses growers were obtained. These lists were further categorized into 4 size-groups i.e. (1) Marginal Farmers (upto 1 ha), (2) Small Farmers (1 – 2 ha.), (3) Medium Farmers

(2 – 4 ha) and (4) Large Farmers (Above 4 ha). From these lists the ultimate samples were undertaken according to probability proportion to the total number in each size group restricting the number of samples to 50 in each of both the groups making the samples in total 100 for in depth study. The reference period for this study was agricultural years from 2006-07 to 2008-09.

Main Findings:-

Status of Pulses Sector in Uttar Pradesh.

1. Area Under Important Crops:-

The crop-wise distribution of area in the state of U.P. shows that the maximum i.e. 78.69 per cent of the gross cropped area was covered by foodgrain crops only including pulses sharing 9.85 per cent, sugarcane covered 8.36 per cent and cotton only 0.02 per cent of the G.C.A. Thus, it is obvious that foodgrain crops are given much importance in Uttar Pradesh and among foodgrains Wheat as well as Rice have been given important places in gross cropped area. Pulses have also covered considerably i.e. about 10 per cent of the gross cropped area of the state.

2. Growth Trends of Important Crops:-

The annual increase in gross cropped area was 0.19 per cent, while total production declined at the annual rate of – 0.21 per cent and as such the average yield declined at the annual rate of – 1.09 per cent in the state of Uttar Pradesh. Thus, it is safely concluded that a scanty increase in gross cropped area of the state had not affected the total production as well as yield in U.P. during 1996-97 to 2007-08. The crop-wise analysis shows that the area under cotton, oilseeds, pulses and maize had declined and the area under sugarcane, rice, wheat and bajra had increased in the state of U.P. Regarding production and yield of important crops it was found that the decline in few crops had dominated the increases in few crops and as such the production and yield had declined in the state of Uttar Pradesh during the span of 1996-97 to 2007-08.

3. Growth of Important Variables i.e. N.S.A., G.C.A., N.I.A., G.I.A. and Fertilizer Consumption etc in Uttar Pradesh:-

The annual decline in N.S.A. was estimated at the rate of – 0.51 per cent during the span of 1996-97 to 2007-08 in U.P. The annual decline in G.C.A. too was estimated at the rate of – 0.20 per cent during the same span of period. The annual increase in N.I.A. in the state of U.P. was estimated at the rate of 1.03 per cent during the same period and the annual increase in G.I.A. was estimated at the rate of 1.13 per cent during 1996-97 to 2007-08. While the increases in the share of N.I.A. in the N.S.A. of the state of U.P. was found to be increased from 6.9 per cent during 1996-97 to 8.1 per cent till the year 2007-08 with an annual growth rate of 1.47 per cent during the same span of period. But the increase in the share of G.I.A. in G.C.A. was found to be increased from 6.6 per cent during 1996-97 to 7.7 per cent till 2007-08 with an annual growth of 1.42 per cent in the span of period.

The annual increase in the Fertilizer consumption was estimated at the rate of 2.49 per cent during the same period. While the per hectare analysis indicates that the annual increase in the per hectare fertilizer consumption was estimated at the rate of 2.76 per cent during the same years.

4. Area Under Pulses in Uttar Pradesh:-

Gram and Lentil (Masoor) were found to cover about half of the total area under pulses in the state of U.P. Urd, Arhar as well as Pea were also found to cover a considerable area of the total coverage under pulses in the state. The area under Moong was reported to be minimum i.e. 2.69 per cent in this state. Thus, Lentil was next important pulse crop after the Gram in this state.

5. Area, Production and Yield of Pulses in the State of Uttar Pradesh:-

**5(a). Area, Production, Yield and Irrigated Area under Urd in Uttar Pradesh
During 1996-97 to 2007-08 :-**

The growth in the area of Urd was negligible in a zig-zag manner in the state of Uttar Pradesh. The production of Urd had increased with an annual growth rate of 3.87 per cent. This clarifies well that growth in the production of Urd in the state of U.P. was considerable during the years 1996-97 to 2007-08. The average annual rate of growth in the yield of urd during 1996-97 to 2007-08 was estimated as 2.51 per cent only in the state as a whole. Thus, the yield of urd was discouraging and more or less stagnated in the state of U.P. The irrigated area under urd was decreased with an annual decrease at the rate of – 2.05 per cent during the same span of period. Thus, the irrigated area of urd in the state as a whole decreased gradually with minor ups and downs during 1996-97 to 2007-08.

**5(b). Area, Production, Yield and Irrigated Area under Moong in Uttar Pradesh
During 1996-97 to 2007-08:-**

The area under Moong decreased continuously with an annual decrease at the rate of – 5.60 per cent in this state. Thus, it is obviously clarified that in the state as a whole there was tremendous decrease in the area of Moong during 1996-97 to 2007-08. The production of Moong decreased with an annual decrease at the rate of – 2.53 per cent during the same span of period. Thus, production of Moong was also much discouraging in the state of U.P. While the annual increase in yield of Moong in this state was estimated at the rate of 3.25 per cent. Thus, the growth in yield of Moong was satisfactory beyond the discouraging performance of area as well as production of Moong in this state. The decrease in irrigated area of Moong was estimated at an annual decrease rate of – 8.56 per cent. Thus, irrigated area under Moong decreased continuously with a faster pace in the same span of period.

5(c). Area, Production, Yield and Irrigated Area under Arhar in Uttar Pradesh During 1996-97 to 2007-08:-

The area under Arhar decreased with an annual decrease at the rate of – 3.16 per cent. Thus, the decrease in the area under Arhar was obviously considerable in the state of U.P. Accordingly the decrease in the production of Arhar was estimated with an annual decrease at the rate of – 4.23 per cent in the state. Thus, the production of Arhar decreased tremendously after 1998-99. The yield of Arhar previously increased till 1998-99. But thereafter decreased with an annual decrease rate of – 1.10 per cent. Thus, the yield of Arhar also decreased considerably in this state during the same period. While the irrigated area under Arhar decreased continuously with ups and downs during 1996-97 to 2007-08 in this state. Thus, it is safely concluded that the area, production, yield and irrigated area under Arhar decreased discouragingly in state of U.P. during 1996-97 to 2007-08.

5(d). Area, Production, Yield and Irrigated Area under Lentil (Masoor) in Uttar Pradesh During 1996-97 to 2007-08:-

The area under Lentil firstly increased till the year 1999-2000 but thereafter it decreased with an annual decrease at the rate of – 2.06 per cent during the same years. Thus, there was a considerable decrease in the area of Lentil in this state. The production of Lentil firstly increased till 2003-04 with ups and downs but thereafter decreased at an annual rate of – 1.76 per cent. Thus, production of lentil also decreased marginally in the state during the same span of period. While the yield of Lentil increased with ups and downs at an annual marginal increase at the rate of 0.31 per cent in this state. Thus, the yield of Lentil increased marginally in the state during the same span of period. The irrigated area under Lentil also increased considerably at an annual rate of 1.54 per cent during the same span of period.

5(e). Area, Production, Yield and Irrigated Area under Gram in Uttar Pradesh
During 1996-97 to 2007-08:-

The area under Gram decreased with an annual decrease at the rate of – 0.57 per cent in this state during 1996-97 to 2007-08. Thus, the area under Gram decreased marginally in the state of U.P. The production of Gram firstly increased till 2000-01. But thereafter, it decreased with an annual decrease at the rate of – 2.41 per cent in this state. Thus, the production of Gram decreased considerably in the state during the same span of period. The yield of Gram increased considerably in the state estimating slightly highest i.e. 10.37 quintal per hectare in 2002-03. Thus, yield of Gram increased considerably in this state during 1996-97 to 2007-08. The irrigated area under Gram increased with an annual increase at the rate of 2.95 per cent during the same span of period. Thus, irrigated area under Gram increased considerably in the state during 1996-97 to 2007-08.

5(f). Area, Production, Yield and Irrigated Area under Pea in Uttar Pradesh
During 1996-97 to 2007-08 :-

The area under Pea decreased with an annual decrease at the rate of – 3.02 per cent during 1996-97 to 2007-08 in U.P. Thus, there was a tremendous decrease in the area under Pea during the same span of period. The production of Pea also decreased varying with ups and downs with an annual decrease at the rate of – 1.41 per cent. Thus, the decrease in the production of Pea was also considerable in the state during same span of period. But the yield of Pea inspite of reduction in area as well as production was found to be increased at a considerable rate of 1.65 per cent during 1996-97 to 2007-08. The irrigated area under Pea decreased with ups and downs with an annual decrease at the rate of – 1.99 per cent during the span of 1996-97 to 2007-08 in the state of Uttar Pradesh.

6. CAGR Over 1996-97 to 2007-08 for A.P.Y. of Important Pulses in Main Districts of Uttar Pradesh:-

6(I). CAGR Over 1996-97 to 2007-08 for A.P.Y. of Urd in Main Districts of Uttar Pradesh:-

The faster increase in the area of Urd in Mahoba and Lalitpur districts dominated the decrease in the area of urd in Hamirpur, Allahabad and Fatehpur Districts and converted the area under urd to be increased considerably in the state of U.P. Regarding production it was found that the overall increase in the production of urd in this state was faster at the rate of 4.78 per cent during the span of 1996-97 to 2007-08. The yield of urd accordingly increased in the state at a considerable rate of 1.46 per cent. Among the districts the increase in yield of urd was fastest at the rate of 14.08 per cent against the lowest at the rate of 0.24 per cent in Allahabad district.

6(II). CAGR Over 1996-97 to 2007-08 for A.P.Y. of Moong in Main Districts of Uttar Pradesh:-

The increase in few districts was balanced by the decrease in few districts and as such it resulted in the increase in the area of Moong to be marginal in this state as a whole. Accordingly the production of Moong was also found to be increased marginally at the rate of 0.75 per cent. The position of districts was similar as was in case of area of Moong. Thus, production of Moong increased marginally in the state as whole. The yield of Moong decreased at the highest rate of – 5.82 per cent in Hamirpur and increased at the highest rate of 2.19 per cent in Banda district. Thus, the increase in the yield of Moong was also found to be quite negligible in the state of U.P. during 1996-97 to 2007-08.

6(III). CAGR Over 1996-97 to 2007-08 for A.P.Y. of Arhar in Main Districts of Uttar Pradesh:-

The highest decrease in the area of Arhar was estimated at the rate of – 12.89 per cent in Jhansi district against the lowest i.e. – 0.28 per cent in Fatehpur district. Thus, the decrease in the area

under Arhar was tremendous in the state as a whole during 1996-97 to 2007-08. Accordingly the production of Arhar also decreased tremendously at the rate of – 7.92 per cent. Yield of Arhar also decreased at the rate of – 4.85 per cent. Thus, the yield of Arhar too decreased tremendously in this state during 1996-97 to 2007-08.

6(IV). CAGR Over 1996-97 to 2007-08 for A.P.Y. of Gram in Main Districts of Uttar Pradesh:-

The area under Gram also decreased tremendously at the rate of – 3.34 per cent in this state. The production of Gram also decreased at the rate of – 0.05 per cent in the state as a whole. Among the districts the highest decrease at the rate of 9.06 per cent in Allahabad and highest increase at the rate 18.12 per cent in Banda district were estimated in this state. Thus, production of Gram decreased marginally in this state. While the yield of Gram increased marginally in the state of U.P. during 1996-97 to 2007-08.

6(V). CAGR Over 1996-97 to 2007-08 for A.P.Y. of Pea in Main Districts of Uttar Pradesh:-

The increase in the area of Pea dominated the decrease in the area of Pea. Thus, it was safely concluded that the area under Pea increased considerably in the state during 1996-97 to 2007-08. The production of Pea also increased considerably dominating the decrease in the production of Pea in this state. While the yield of Pea decreased marginally in this state during the same span of period. The rate of decrease was estimated as – 0.22 per cent in the state as a whole.

6(VI). CAGR Over 1996-97 to 2007-08 for A.P.Y. of Masoor in Main Districts of Uttar Pradesh:-

The increase in the area of Masoor in the state of U.P. was found to be considerable on an overall. While the production of Masoor decreased marginally as the increase in few districts was dominated by decrease in few districts resulting in the decrease at the rate of – 0.09 per cent

in this state. The yield of Masoor also decreased at the rate of – 1.09 per cent and as such the yield of Masoor decreased marginally in this state during the same span of period.

Demographic Profile and Cropping Pattern of the Study Region

1. General Overview of Sample Farmers of NFSM District Lalitpur:-

The number of males was higher than females and there was no large farmers in this district. The number of illiterates was higher among small and medium farmers against the higher literacy witnessed among marginal farmers particularly adult members. Regarding castes this study reflects that SCs and OBCs were dominant castes among sample farmers.

2. Crop-Structural Components in NFSM Lalitpur District:-

This study reveals that pulses were main crops across size of farms and no rice crop was grown on any of sample farms. Zaid crops were not at all grown in this district and the variation in cropping pattern on different size of farms was marginal. Urd and Pea were the main pulses. Moong was not at all grown by marginal farmers. As the growth in area of pulses was only 2.13 per cent over the period, hence it was concluded that area under pulses on various size of farms was more or less stagnant.

3. Irrigation Resources in NFSM Lalitpur District:-

The analysis in table-III-20 indicate that the maximum of cultivated area was found to be irrigated by canal. Urd and Moong were not at all irrigated by sample farmers, while Pea was fully irrigated by sample farmers of all the size-groups in this district.

4. General Overview of Sample Farmers of Non-NFSM Allahabad District:-

In this district also the number of males was comparatively higher (52.66 per cent) against 47.34 per cent of the female members. As regards the castes there was preponderance of OBCs among the sample farmers. While SCs were centred among marginal sample farmers and general castes

were centralized among only medium sample farmers. Regarding education the sample farmers of marginal size-group were mostly illiterates. Among all the sample farmers generally they were well educated across the size of farms. The literacy was higher among adult members on medium large size of farms as none was illiterate among adult members of large sized farms.

5. Crop-Structural Components in Non-NFSM Allahabad District:-

In this district the area under cereals was higher i.e. 44.43 per cent of the gross cropped area and 41.96 per cent of the G.C.A. was under pulses. The share of area under pulses was found decreasing with the increase in the size of farms. This clearly reflects that marginal farmers had devoted more area under pulses in comparison to medium and large farmers. The area under Kharif crops was higher by 3.80 per cent over the area under Rabi crops. While among pulses in general the coverage under Rabi pulses was higher being 28 per cent of G.C.A. against 13.96 per cent covered under Kharif pulses. Among pulses Masoor was main crop covering 49.83 per cent of the area under total pulses.

6. Irrigation Resources in Non-NFSM Allahabad District:-

Canal and tube-wells were the main sources of irrigation across the size of farms. The irrigated area was found increasing with the increase in the size of farms. This clearly reflects that large farmers had better irrigation facilities in comparison of small and marginal farmers in the area under study. The share of irrigated area under pulses was found decreasing with the increase in the size of farms.

Economics of Pulses Cultivation

1. Economics of Individual Pulses Crops Cultivation in NFSM District Lalitpur:-

In case of Urd the increase in net return per hectare as well as per quintal was due to increase in productivity and price hike during 2006-07 to 2008-09. The gross return per hectare and per quintal had increasing trend on all the sample farms during 2006-07 to 2008-09 in NFSM district

Lalitpur. While the increase in net return per hectare and per quintal in case Moong due to price hike in 2008-09. The return was higher on medium farms as compared to the small farmers due to higher productivity. Thus, Moong was a profitable crop in the area under study. Pea was a popular pulse crop and return per hectare and per quintal had an increasing trend on the farms. Thus, it is concluded that Pea was most profitable crop in NFSM district Lalitpur.

2. Economics of Individual Pulses Crops Cultivation in Non-NFSM District Allahabad:-

In Allahabad district also urd was an important crop but the net return per hectare and per quintal had decreased on medium and large farms. The gross return decreased while the cost incurred increased. Thus, it is concluded that urd was not profitable crop in this district. In case of Arhar the return per hectare and per quintal was higher on medium farms in comparison of small farms during the study period. The gross return, paid out cost and net return had increasing trend. In case of Masoor also the paid out cost per hectare and per quintal was increasing continuously. Still the profitability of this crop was satisfactory across the size-groups of farms. Thus, it was a promising pulse crop on all the farms. The productivity of Gram on all the farms was decreased year after year and hence the return per hectare and per quintal had decreased in this district over the period of study. Thus, it is concluded that Gram was not profitable crop on the farms Allahabad during the study period.

Technology Adoption, Marketing and other Issues:-

1. Technology Adoption:-

The response of improved varieties of pulses in NFSM district Lalitpur was better as the area under improved varieties of important pulses was considerably higher. While in Non-NFSM district Allahabad the area under improved varieties of important pulses undertaken was discouraging except Masoor. This clearly indicates that effect of National Food Security Mission (2008) was not effective in Allahabad district as effective in NFSM district Lalitpur. Due to canal irrigation in Lalitpur district the area was shifted to Pea and other competing crops. Thus, response of NFSM was highly effective in this district. While in Non-NFSM district Allahabad the area under improved varieties were in case of Urd, Arhar and Gram only hence improved

technology was adopted in only a few important pulses in Non-NFSM district Allahabad. 100 per cent of sample farmers had knowledge about improved varieties of pulses. Thus, it is evidently clear that farmers of both the district were well aware about improved varieties of pulses. The main sources of knowledge about improved varieties of pulses in NFSM district Lalitpur were extension agents while in non-NFSM district Allahabad. The main sources of knowledge were the neighbors and there were no large farmers, hence NFSM was not effective in this district. Regarding recommended practices followed farmers of Lalitpur followed only sowing and seed practices. In Allahabad too sowing, seeds and other practices were followed. Thus, in both the district NFSM was ineffective in respects of recommended practices being followed. Regarding problems with improved varieties of important pulses it was reported that non-availability of seeds, untimely availability of seeds, seeds were very expensive and I.V. needed large doses of other inputs and much lower yield of pulses as well as inadequate pest resistance were the main problems in NFSM district Lalitpur. Similar problems were reported in non-NFSM district Allahabad too. As regards solution for problems of improved varieties of important pulses in NFSM district Lalitpur as well as non-NFSM district Allahabad it was reported that cheaper availability of improved variety seeds, timely availability of seeds, and increase in subsidy involved were suggested in both the district to be the main solutions.

2. Marketing Channels and Quantity of Pulses Marketed:-

In NFSM District Lalitpur apart from regulated markets some other marketing channels were also used by 54 per cent i.e. more than half of the sample farmers. While in non-NFSM district Allahabad marketing of pulses produced was quite unorganized which clarifies that NFSM (2008) was ineffective in Allahabad district. Regarding quantity of pulses marketed it was found that maximum amount of marketable surpluses was marketed through regulated markets in NFSM district Lalitpur. The larger quantity of urd was sold by small and medium farmers in this district while in non-NFSM district Allahabad the marketing of urd was negligible. The quantity of Moong in Lalitpur was sold through regulated markets by medium farmers. The quantity sold by other channels was negligible. In case of Arhar in non-NFSM district Allahabad the medium farmers were the main producers of pulses who had marketed surplus too. In case of Pea in NFSM district Lalitpur, the maximum quantity was sold by small and medium farmers. Thus,

role of regulated markets was significant and as such NFSM was effective in this district. In case of Masoor in non-NFSM district Allahabad the quantity sold by small and large farmers was also considerable. In case of Gram the quantity sold in Allahabad district was quite negligible and as such NFSM (2008) was not at all effective in this district.

3. Procurement of Pulses by Govt. (NAFED) from Farmers:-

In both NFSM and non-NFSM district the procurement by NAFED was nil. Thus, it is well clarified that in both the district no procurement was done by the government (NAFED).

Farmers Perceptions:-

1. Reasons for Growing Pulses:-

In NFSM district Lalitpur farmers were compelled to grow pulses because their soil was not suitable to grow other crops. Inferior quality of land was also a reason for growing pulses and lack of irrigation facilities was also reason in this district. In non-NFSM district Allahabad the main reasons were lack of irrigation, profitability and inferior quality of land.

2. Criteria used while Opting to Grow Pulses:-

In NFSM district Lalitpur soil suitability and inferior quality of land were the main criterias to grow pulses. Irregular rainfall was also a criteria in this district. While in non-NFSM district Allahabad soil suitability and inferior quality of land were the main criterias to grow pulses.

3. Reasons for Low Area Under Pulses:-

In Lalitpur district the main reason for low area under pulses were problems of pests, marketing and instability in production. In non-NFSM district Allahabad the main reason were pest problems and other problems.

4. Pulses and other Crops Grown on Inferior Quality of Land:-

In NFSM district Lalitpur farmers opined that they use to grow pulses and other crops on inferior land only. In non-NFSM district Allahabad also are grown on inferior quality of land only.

5. Problems of Growing Pulses on Inferior Quality of Land:-

In NFSM district Lalitpur the main problems were lower yield and poor grains quality. In non-NFSM district Allahabad also the same problems were told by the majority of farmers.

6. Reasons for Shifting from Pulses to Other Crops:-

In NFSM district Lalitpur the main reasons for shifts were low yield and prices, uncertain yield of improved varieties and lack of assured markets. In non-NFSM district Allahabad too the main reason was low yield and prices.

7. Major Problems:-

In NFSM district Lalitpur major pests were wilt, root-rot, pod borers and nematodes. The maximum loss was due to pod fly. In non-NFSM district Allahabad too the maximum loss in yield was due to pod fly.

8. Major Problems in Cultivating Pulses:-

In NFSM district Lalitpur the first major problems was lack of seeds of improved varieties of pulses, second was low yield and third was low market prices. In non-NFSM district Allahabad too the major problems were lack of seeds of improved varieties and low yield.

9. Important Suggestions:-

In NFSM district Lalitpur the main suggestion was availability of seeds of high yielding varieties of pulses. High market prices and better irrigation facilities were also suggested in this district. In non-NFSM district Allahabad farmers suggested for improving irrigation facilities and high marketed prices through M.S.P. and pest resistance.

10. Whether Farmers are Willing to Grow More Pulses if Government Provides the Assured Procurement:-

In both NFSM and non-NFSM districts the 100 per cent farmers were willing to grow more pulses if government provides assured procurement in their areas.

Impact of NFSM Pulses on Pulses Production:-

1. Awareness about the NFSM:-

About 90 per cent of the sample farmers of Lalitpur district were aware of the NFSM-Pulses.

2. Assistance Received and Type of Assistance:-

The analysis shows that about 64 per cent of the sample farmers had received assistance under NFSM during 2008-09. 22 per cent received assistance on seeds and 20 per cent demonstration and training under NFSM.

3. Whether Assistance Received is useful and in What Way?

The seed supply under NFSM was quite encouraging to boost productivity of pulses. Training and demonstration were useful in adoption of new techniques. Also small farmers were much benefited than other categories of farmers.

4. Area under Pulses Before and After NFSM:-

All the sample farmers have expanded their area under Pea and Urd. This clarifies that the impact of NFSM was positive in increasing the area under Urd and Pea across the size of farms.

5. Major Suggestions from Farmers for Improving NFSM-Pulses:-

7. Timely availability of suitable certified seeds of improved varieties with rhizobium culture.
8. Assistance from INM and IPM should be provided.
9. Training and demonstrations under NFSM must be promoted.
10. Subsidy on seeds and equipments must be increased.
11. MSP of all pulses must be increased.
12. Irrigation facilities must be increased to grow Zaid pulses too.

Suggestions and Policy Implications

Suggestions:

11. Adequate and timely availability of certified seeds of important pulses on subsidized rate must be assured by the Government.
12. Existing irrigation facilities must be extended particularly in the rainfed areas of the state.
13. Subsidy on other costly inputs such as machinery, implements, fertilizers and pesticides should be increased.
14. Sufficient assistance of I.N.M. and I.P.M. should be provided particularly to predominant pulses growers for boosting the yield of pulses.
15. Remunerative and assured M.S.P. (minimum support prices) must be fixed for various pulses.
16. Organization of more meetings with the farmers must be promoted to make them aware with NFSM for developing their interest in pulses cultivation.

17. An appropriate strong strategy must be framed to protect the pulses from attacks of blue-bulls which is a regular menace across the state.
18. Demonstrations and training programmes under NFSM must be promoted on large scale particularly in the remote areas of the state.
19. Some suitable short duration varieties of pulses should be propagated for the large unirrigated and rainfed area of the state.
20. More number of staff under NFSM must be increased across the state for proper implementation.

Policy Implications

9. Since Uttar Pradesh rank first in the production of total foodgrains, wheat, potato, vegetables, sugarcane as well as milk and second in the production of pulses as well as rice in India, it has the capacity to meet the challenges of livelihood security of not its own but of the whole country. This state can easily obtain first rank in the production of pulses as well as rice. Farmers are very much interested to grow more pulses as these have become profitable to cultivate them. But to bring it into practice the U.P. government must adopt such an agricultural policy which may emphasize more profoundly and provide assured markets for pulses. The first need would be to redesign the price-policy taking all the aspects into consideration such as cultivating pulses in lean and leap years, checking the price going down in case of bumper production and prices going up in case of crop failure.
10. Since this state has large rainfed and unirrigated area, government should arrange and encourage for developing suitable short duration varieties of high yielding seeds of pulses. Also the varieties tolerant to heat stress and drought must be developed. Varieties tolerant to the moisture stress should also be developed to bring more area under pulses in irrigated condition and check the shifting to other crops.
11. Subsidy provided under NFSM-Pulses on various inputs are scanty and based on old prices. Therefore, seeing the current price hike on all the inputs the amount of subsidy to be provided further should be increased accordingly by changing the policy to encourage the pulses growers.

12. Since the nature of existing varieties of pulses is of generally giving low productivity, the specific varieties of pulses should be developed by making sound agricultural policy for improving the genetic production potential of pulses in the country itself.
13. Across the state of Uttar Pradesh there is a regular menace of attack by blue-bulls particularly on pulses. Therefore, a sound policy should be framed to eradicate this problem from the whole state by making blue-bulls centuries or habitats.
14. Although shortage of labourers is not acute problem in the state. But during the peak seasons there happen some shortage merely due to implementation of NREGA scheme in the state. Therefore, government should find-out some proper solutions.
15. In the main pulses growing district the major problem faced by majority of farmers was attack of insects & pests on pulses during ripening particularly by pod boerer, pod fly rod-rot and wilt. Some sound policy should be framed by the assistance of Integrated Pest Management (I.P.M.) under NFSM-Pulses programme in the state as a whole.
16. For boosting the area, production and yield of pulses, some crop specific and area specific approaches should be developed by changing the existing agricultural policies in the country.