Implementation of National Food Security Mission for Pulse Crops in Maharashtra

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Introduction

The agricultural sector has always been an important component of the Indian economy. However, rapid industrialization, ever increasing population and adverse climatic effects have badly influenced our agricultural sector. In the present milieu, attaining food security and remaining food secure has become more complex. This is mainly owing to the fact that Indian agriculture at present is facing several constraints as well as challenges due to less than 2 per cent annual growth of the sector in more recent times. Though the National Policy on Agriculture (NAP) document released in July 2000 envisages agricultural growth rate in excess of 4 per cent per year over the next two decades, the achievement of this growth to a greater extent depends on market and irrigation infrastructure development and the adoption of biotechnology, especially genetic modification. With a view to raise the productivity and production of food crops to meet their increased demand due to ever increasing population pressures, the NAP categorically emphasizes upon adoption of differentiated strategy for different regions, taking into account the agronomic, climatic and environmental conditions to achieve the full growth potential of every region. It also pins attention on development of new crop varieties of food crops to achieve higher nutritional value through biotechnology measures (NAP, 2000).

India at present finds itself in the paradoxical situation: endemic mass-hunger coexisting with mounting foodgrain stocks. This is despite India having a laudable food security policy, which ensures availability of food grains to the common people at an affordable price with poor having access to food. However, the issues of poverty and sustainability in production still defeat the objectives of food security. In fact, the sluggish growth in area as well as production of majority of pulses and course cereals cultivated in India has led the country to pass through a complex type of situation.

A number of earlier studies have also shown a sluggish and erratic growth in pulses and coarse cereal production, though most of the studies are area specific (Moorti et. al. 1991; Bhatia, 1991, Shah, 1997). In the late 1970's and early 1980's, several studies raised concerns about a possible deceleration in the growth of foodgrain production, indicating a decline in the momentum of the green revolution and possible exhaustion of the potential of available technology (Alagh and Sharma, 1980; Desai and Namboodiri, 1983). Dantwala (1978) found that the HYV technology brought about significant improvement in the productivity of cereal crops, but its overall effect on foodgrain production, especially when evaluated in per capita terms, was

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not significant. A significant section also showed serious doubts about the productivity of modern inputs that are used in increasing quantities to sustain growth. The Government of India is now giving top priority for boosting the production of pulses in the country with the objective of meeting their domestic requirement and also to reduce their import bill.[1]

In view of the fact that earlier programmes relating to pulses sector [2] hardly led to any improvement in pulses production of India, the National Development Council (NDC) in its 53rd meeting held on 29th May, 2007 resolved to launch a Food Security Mission for rice, wheat and pulses, especially for raising the production levels by 10 million tonnes for rice, 8 million tonnes for wheat and 2 million tonnes for pulses by the end of the Eleventh Five Year Plan (2011-12). In order to achieve these targets and operationalise the resolution taken by NDC, the 'National Food Security Mission (NFSM)' was launched in 2007-08 as a Centrally Sponsored Scheme. The NFSM comprises of three components, which include rice, wheat and pulses.

The major causes of concerns with respect to pulses crops are the low yield levels, marginal lands devoted to pulse cultivation, stagnation in production technology, severe abiotic (climate-related) and biotic (insect, pest) stresses, volatility of prices and lack of effective procurement. These problems are noticed in all the states of India and Maharashtra is not an exception to this phenomenon. Despite the fact that Maharashtra accounts for about 15 per cent share in area and production of pulse crops of India, the productivity levels of pulses have remained lower in this State as against the national average. One of the major reasons for the low productivity of pulses in Maharashtra could be assigned to the cultivation of these crops mainly under rainfed conditions. The present study, therefore, attempts to assess as to how far the implementation of NFSM-pulses is successful in augmenting production as well as profitability in pulses cultivation and what problems are most discernible in the cultivation of these valued crops.

Data and Methodology

The study was carried in two districts of Maharashtra – one covered under the umbrella of NFSM and the other not falling under the preview of NFSM. Based on higher area allocation under pulses crops during 2008-09, the district of Amravati was selected as NFSM district and Beed as non-NFSM district in the state of Maharashtra. It was decided to select one Taluka from each of the selected sampled districts based on similar criteria as followed in the case of selection of districts in the State. The Talukas of Daryapur in Amravati district and Majalgaon in Beed district showed significantly high area under pulses crops, and these two Talukas were, therefore, further selected for the present investigation. The study is confined to the selection of only one village from the NFSM district of Amravati and non-NFSM district of Beed, and, therefore, the village of Ramagad from Amravati district and Majalgaon from Beed district were further selected randomly for the present investigation subject to the condition that they should be having sufficient area allocation under pulses crops and that farmers belonging to the selected villages

should be having cultivation of some other competing field and other crops with a view to evaluate the actual impact of NFSM on pulses vis-à-vis other crops.

In this study, it was decided to select 50 sampled farmers from the NFSM district of Amravati and 50 from non-NFSM district of Beed. Therefore, a complete enumeration of the two selected villages was done with view to further categorization of farmers into marginal (less than 1 hectare), small (1 to 2 hectares), medium (2-4 hectares) and large (above 4 hectares). The probability proportion to sample size technique was used for further selection of farmers under each of the land holding size category from the selected sampled villages. The number of sampled farmers in the selected Ramagad village encompassed 15 in marginal category, 19 in small, 10 in medium and 6 in large category with a sum of 50 farmers drawn from the district of Amravati. Similarly, the number of sampled farmers in the selected Majalgaon village encompassed 14 in marginal category, 17 in small, 13 in medium and 6 in large category with a sum of 50 farmers.

Empirical Findings

The empirical findings of this paper mainly revolve around evaluating cropping pattern of sampled farmers, area under irrigation, cost and return structure in the cultivation of pulses crops, problems faced by the farmers, assistance received and suggested measures to improve NFSM-Pulses programme in the state of Maharashtra.

Cropping Pattern of Sampled Farmers

In general, the cropping pattern of irrigated area differs from the cropping pattern of un-irrigated area. While on one hand, high value commercial field crops are usually grown under irrigated conditions, low value subsistence crops, on the other hand, find place under rainfed conditions. The information on average area allocation (average of 2006-07, 2007-08, 2008-09) under different crops grown under different seasons by the sampled farmers of NFSM district of Amravati and non-NFSM district of Beed is provided in Table 1 and Table 2.

In the NFSM district of Amravati, the cropping pattern of sampled farmers was seen to be in favour of cultivating soybean, jowar, cotton, bajra, sunflower, ladyfinger, mung and tur in kharif season and gram and sunflower in rabi season. All the categories of sampled farmers put together of Amravati district showed a net sown area of 227.74 acres in kharif season, which encompassed 167.06 acres of area under pulse crops like mung and tur, and 60.67 acres area under other crops like soybean, jowar, cotton, bajra and some other crops viz. sunflower and ladyfinger (Table 1 and Table 1 (a)). The net sown area with all the sampled farmers of Amravati district put together was estimated at 158.23 acres in rabi season, which encompassed 149.69 acres area under gram and 8.54 acres under other crop like sunflower. Thus, pulses crops predominated in the cropping pattern of sampled farmers of Amravati district since the average category of farmer of this district showed 73 per cent of net sown area under pulses crops in kharif season and as high as 95 per cent in rabi season.

Table 1: Cropping Pattern – Over All Seasons: NFSM Amravati District

(Area in Acres; Average of 2006-07, 2007-08, 2008-09)

Category	Area Sown													
	Kharif Season										Rabi Season			
	Other Crops						Pulses				Pulse	Other		
	Soybean	Jowar	Cotton	Bajra	Others	Total	Mung	Tur	Total	G. Total	Gram	Sunflower	Total	G. Total
Marginal	2.75	1.33	1.00	-	0.67	5.75	19.25	1.58	20.83	26.58	21.33	2.42	23.75	50.33
Small	3.52	4.49	5.23	0.87	4.24	18.34	39.45	5.22	44.66	63.00	39.69	1.79	41.48	104.48
Medium	3.50	5.25	7.00	-	3.00	18.75	44.08	5.42	49.50	68.25	43.17	2.00	45.17	113.42
Large	4.33	6.50	6.67	-	0.33	17.83	47.40	4.67	52.07	69.90	45.50	2.33	47.83	117.73
Total	14.10	17.57	19.90	0.87	8.24	60.67	150.18	16.88	167.06	227.74	149.69	8.54	158.23	385.97

Note: In 2007-08 'Others' under other crops include Kharif Sunflower and in 2008-09, 'Others' under other crops include Kharif Sunflower and Ladyfinger

Table 1 (a): Cropping Pattern – Over All Seasons: NFSM Amravati District

(% of Total Area Sown; Average of 2006-07, 2007-08, 2008-09)

Category	Area Sown												
	Kharif Season										Rabi Season		
	Other Crops						Pulses				Pulse	Other	
	Soybean	Jowar	Cotton	Bajra	Others	Total	Mung	Tur	Total	G. Total	Gram	Sunflower	Total
Marginal	10.35	5.00	3.76	-	2.52	21.63	72.42	5.94	78.37	100.00	89.81	10.19	100.00
Small	5.59	7.13	8.30	1.38	6.73	29.11	62.62	8.29	70.89	100.00	95.68	4.32	100.00
Medium	5.13	7.69	10.26	-	4.40	27.47	64.59	7.94	72.53	100.00	95.57	4.43	100.00
Large	6.19	9.30	9.54	-	0.47	25.51	67.81	6.68	74.49	100.00	95.13	4.87	100.00
Total	6.19	7.71	8.74	0.38	3.62	26.64	65.94	7.41	73.36	100.00	94.60	5.40	100.00

The sampled farmers belonging to non-NFSM district of Beed showed their cropping pattern in favour of cultivating soybean, jowar, cotton, bajra, mung and tur in kharif season, and gram, sugarcane, jowar, wheat, onion, banana, etc. in rabi season. The sampled farmers of Beed district with all the categories put together showed a net sown area of 244.24 acres in kharif season, which encompassed 87.07 acres of area under pulse crops like mung and tur, and 157.17 acres area under other crops like soybean, jowar, cotton and bajra (Table 2 and Table 2 (a)). The net sown area with all the sampled farmers of Beed district put together was estimated at 190.78 acres in rabi season, which encompassed 85.63 acres under gram, 66.33 acres under sugarcane and 38.82 acres under other crops like jowar, wheat, sunflower, onion, banana, etc. Thus, the predominance of pulses crops in the cropping pattern of sampled farmers of Beed district was relatively much lower as compared to sampled farmers belonging to the district of Amravati.

Table 2: Cropping Pattern – Over All Seasons: Non-NFSM Beed District

(Area in Acres; Average of 2006-07, 2007-08, 2008-09)

Category	Area Sown													
	Kharif Season										Rabi Season			
	Other Crops						Pulses				Pulse	Other		
	Soybean	Jowar	Cotton	Bajra	Others	Total	Mung	Tur	Total	G. Total	Gram	Sugarcane	Other	Total
Marginal	1.50	0.43	11.32	0.83	-	14.08	2.42	5.60	8.02	22.10	8.37	1.50	-	9.87
Small	7.33	0.00	23.75	4.17	-	35.25	15.50	9.90	25.40	60.65	18.37	5.33	5.83	29.53
Medium	5.67	0.92	38.67	0.17	-	45.42	7.25	18.07	25.32	70.73	11.57	6.17	12.89	30.63
Large	10.08	0.00	37.00	15.33	-	62.42	14.67	13.67	28.33	90.75	47.33	53.33	20.09	120.75
Total	24.58	1.35	110.73	20.50	-	157.17	39.83	47.24	87.07	244.24	85.63	66.33	38.82	190.78

Note: i) The total area under Rabi season include area under Gram, Sugarcane, and some other crops like Sunflower, Rabi Jowar, Wheat, onion, Kardi, and Banana

Table 2 (a): Cropping Pattern – Over All Seasons: Non-NFSM Beed District

(% of Total Area Sown; Average of 2006-07, 2007-08, 2008-09)

Category	Area Sown													
	Kharif Season										Rabi Season			
	Other Crops						Pulses				Pulse	Other		
	Soybean	Jowar	Cotton	Bajra	Others	Total	Mung	Tur	Total	G. Total	Gram	Sugarcane	Other	Total
Marginal	6.79	1.95	51.22	3.76	-	63.71	10.95	25.34	36.29	100.00	84.80	15.20	-	100.00
Small	12.09	0.00	39.16	6.88	-	58.12	25.56	16.32	41.88	100.00	62.21	18.05	19.74	100.00
Medium	8.02	1.30	54.67	0.24	-	64.22	10.25	25.55	35.80	100.00	37.77	20.14	42.09	100.00
Large	11.11	0.00	40.77	16.89	-	68.78	16.17	15.06	31.22	100.00	39.20	44.17	16.63	100.00
Total	10.06	0.55	45.34	8.39	-	64.35	16.31	19.34	35.65	100.00	44.88	34.77	20.35	100.00

The foregoing observations bring us closer to the fact that the cropping pattern of sampled farmers drawn from the NFSM district of Amravati and non-NFSM district of Beed differed significantly. While pulses crops predominated the cropping pattern of sampled farmers of Amravati district during kharif as well as in rabi seasons, the area predominance with respect to pulses crops was less for the sampled farmers drawn from the district of Beed, as the sampled farmers of this district mainly cultivated some other crops. This is concomitant from the fact that the average category of farmer belonging to Amravati district showed 73 per cent of the net sown area under pulses crops in kharif season and 95 per cent in rabi season, whereas these proportions in the district of Beed were worked out at 36 per cent and 45 per cent. The average category of sampled farmers belonging to the district of Beed had about 45 per cent of net sown area under cotton crop in kharif season and 35 per cent of the net sown area under sugarcane in rabi season. In the case of non-NFSM district of Beed, some other rabi crops like jowar, banana, wheat, onion, etc. accounted for significant share in net sown area for the average category of sampled farmers.

Area under Irrigation for Pulses Crops

The estimates relating to the extent of average (average of 2006-07, 2007-08, 2008-09) area under irrigation for various pulses crops cultivated during kharif and rabi seasons by various categories of sampled farmers of NFSM district of Amravati and non-NFSM district of Beed are provided in Table 3 and Table 4.

In the NFSM district of Amravati, although the net sown area under pulses crops with all the sampled farmers put together stood at 167.06 acres in kharif season and 149.69 acres in rabi season, the entire area under pulses crops during both kharif and rabi seasons was found to be rainfed or unirrigated, and, therefore, the proportion of irrigated area to net sown area with respect to pulses crops was nil in this district (Table 3).

As against the NFSM district of Amravati, the sampled farmers of the non-NFSM district of Beed showed some presence of irrigation with respect to pulses crops as the proportion of irrigated area to net sown area for pulses crops with all the sampled farmers put together was estimated at 18.76 per cent in kharif season and 14.40 per cent in rabi season (Table 4).

Table 3: Percentage of Irrigated Area under Pulses: Over All Seasons: NFSM Amravati District

(Area in Acres; Average of 2006-07, 2007-08, 2008-09)

Category	Irrigated Area				
	Kharif Season			Rabi Season	
	Mung	Tur	Total	Gram	Total
Marginal	-	-	-	-	-
Small	-	-	-	-	-
Medium	-	-	-	-	-
Large	-	-	-	-	-
Total	-	-	-	-	-
	Total Area Under the Crop				
Marginal	19.25	1.58	20.83	21.33	21.33
Small	39.45	5.22	44.66	39.69	39.69
Medium	44.08	5.42	49.50	43.17	43.17
Large	47.40	4.67	52.07	45.50	45.50
Total	150.18	16.88	167.06	149.69	149.69
	% of Irrigated Area				
Marginal	-	-	-	-	-
Small	-	-	-	-	-
Medium	-	-	-	-	-
Large	-	-	-	-	-
Total	-	-	-	-	-

Table 4: Percentage of Irrigated Area under Pulses: Over All Seasons: Non-NFSM Beed District

(Area in Acres; Average of 2006-07, 2007-08, 2008-09)

Category	Irrigated Area				
	Kharif Season			Rabi Season	
	Mung	Tur	Total	Gram	Total
Marginal	-	-	-	-	-
Small	1.33	-	1.33	1.33	1.33
Medium	1.33	2.00	3.33	3.00	3.00
Large	9.00	2.67	11.67	8.00	8.00
Total	11.66	4.67	16.33	12.33	12.33
	Total Area Under the Crop				
Marginal	2.42	5.60	8.02	8.37	8.37
Small	15.50	9.90	25.40	18.37	18.37
Medium	7.25	18.07	25.32	11.57	11.57
Large	14.67	13.67	28.33	47.33	47.33
Total	39.83	47.24	87.07	85.63	85.63
	% of Irrigated Area				
Marginal	-	-	-	-	-
Small	8.58	-	5.24	7.24	7.24
Medium	18.34	11.07	13.15	25.93	25.93
Large	61.35	19.53	41.19	16.90	16.90
Total	29.27	9.89	18.76	14.40	14.40

During kharif season, the proportion of irrigated area to net sown area with respect to pulses crops was estimated at 5.24 per cent for small category, 13.15 per cent for medium category, and 41.19 per cent for large category with an overall average of 18.76 per cent for the average category of farmers belonging to the non-NFSM district of Beed. As for rabi season, the small, medium, large and average category of farmers of Beed district showed 7.24 per cent, 25.93 per cent, 16.90 per cent, and 14.40 per cent of their net sown area of pulses crops under irrigation (Table 4).

Thus, while the sampled farmers belonging to the NFSM district cultivated various pulses crops under rainfed conditions, the cultivation of these crops by the sampled farmers of non-NFSM district of Beed was under both irrigated and unirrigated conditions. However, the extent of area under irrigation with respect to pulses crops was very low in Beed district, and, in general, the proportion of irrigated area to net sown area for pulses crops with all the sampled farmers put together stood at 18.76 per cent in kharif season and 14.40 per cent in rabi season. It was only in the case of mung that about 61 per cent of net sown area was under irrigation in the case of large category of sampled farmers belonging to the non-NFSM district of Beed.

Profitability in Pulses Crops Cultivation

The extent of profit involved in the cultivation of pulses crops vis-à-vis other crops in both NFSM district of Amravati and non-NFSM district of Beed is evaluated for three reference years viz. 2006-07, 2007-08 and 2008-09, where reference years 2006-07 and 2007-08 represent the scenario obtaining in terms of profitability of crops before initiation of NFSM for pulses crops and the reference year 2008-09 shows the scenario obtaining in this respect after the initiation of NFSM for pulses crops, i.e. the impact of the NFSM programme. Although profitability analysis has been performed for all the pulses and other crops cultivated on the farms belonging to NFSM district of Amravati and non-NFSM district of Beed, this paper provides profitability with respect to only pulses crops in NFSM district of Amravati and non-NFSM district of Beed.

The per hectare net return estimates with respect to total pulses encompassing kharif mung and tur and rabi gram for various categories of sampled farmers of Amravati district coupled with net returns per quintal emanating from total pulses crops are provided in Table 5.

In the cultivation of mung crop, an increasing trend was noticed in terms per hectare net return from 2006-07 to 2007-08 and from 2007-08 to 2008-09, indicating a steady increase in the same throughout the period between 2006-07 and 2008-09 (Table 5). All the categories of sampled farmers of Amravati district showed an increase in per hectare net return for mung crop during the given period of time. Even per quintal returns from mung crop increased during this across all the categories of sampled farmers of Amravati district. The per hectare net return from gram crop cultivation for the average category of farmer was estimated at Rs.8,660 in 2006-07, Rs.9,448 in 2007-08, and Rs.13,113 in 2008-09. The per quintal net return in the cultivation of gram crop for the average category of farmer was estimated at Rs.1,734 in 2006-07, Rs.1,794 in 2007-08, and Rs.2,237 in 2008-09.

The pulse crop like tur also showed an increase in per hectare net returns, and also per quintal net returns from 2006-07 to 2007-08 and from 2007-08 to 2008-09 for all the categories of sampled farmers drawn from the district of Amravati. The net returns from tur crop cultivation on per hectare basis and on per quintal basis were substantially high in 2008-09 as compared to the reference years 2006-07 and 2007-08. In fact, the area allocation under tur crop was not much in the NFSM district of Amravati. Although the per hectare and per quintal net returns for tur crop

increased with the increase in land holding size of sampled farmers of NFSM district of Amravati, the general trend showed that the average category of sampled farmers in Amravati district generated per hectare net return from tur crop cultivation to the tune of Rs.15,802 in 2006-07, Rs.15,866 in 2007-08, and Rs.24,372 in 2008-09, showing a sharp increase in per hectare net returns from tur crop cultivation in 2008-09 as compared to 2006-07 and 2007-08. The per quintal net return in tur crop cultivation for the average category of farmer of Amravati district was estimated at Rs.1,618 in 2006-07, Rs.1,621 in 2007-08, and Rs.2,002 in 2008-09.

Like mung crop in kharif season, the gram crop cultivated during rabi season showed significant area allocation of the sampled farmers of Amravati district. The gram crop also showed an increase in per hectare net returns and per quintal net returns with the increase in land holding size of sampled farmers belonging to NFSM district of Amravati (Table 5). All the categories of sampled farmers of Amravati district showed more than two folds rise in per hectare net returns from gram crop in 2008-09 as compared to 2006-07 (Table 5). Even per quintal net returns from gram crop was more than one and a half times in 2008-09 over that of 2006-07 and this held true for all the categories of sampled farmers of Amravati district. The per hectare net returns from gram crop for the average category of farmer of Amravati district was estimated at Rs.8,171 in 2006-07, which increased to Rs.13,707 in 2007-08, and further to Rs.20,300 in 2008-09. Similarly, the per quintal net returns from gram crop for the average category of farmer of Amravati district was estimated at Rs.924 in 2006-07, which increased to Rs.1,299 in 2007-08, and further to Rs.1,652 in 2008-09. The plausible reason for higher per hectare and per quintal net returns in 2008-09 over that of 2006-07 could be rise in yield and prices of gram crop.

Table 5: Profitability in Pulses Crops Farming: NFSM Amravati District

(Return in Rupees)

	Mung		Tur		Gram		Total Pulses	
Category/ Year	Net Returns per Hectare	Net Returns Per Quintal	Net Returns per Hectare	Net Returns Per Quintal	Net Returns per Hectare	Net Returns Per Quintal	Net Returns per Hectare	Net Returns Per Quintal
Marginal								
2006-07	7452.47	1589.86	15488.00	1548.80	7275.68	885.04	7595.96	1136.73
2007-08	9551.43	1857.22	16515.00	1651.50	15040.69	964.58	12828.08	1508.65
2008-09	12615.20	2167.76	23217.50	1857.40	18333.04	1531.57	15590.14	1750.25
Small								
2006-07	8564.60	1723.46	17540.35	1701.79	7907.53	906.87	8801.57	1255.8
2007-08	10172.06	1862.27	17554.38	1755.44	13764.62	1310.95	12301.93	1509.82
2008-09	13872.35	2298.13	23365.13	1951.19	17813.46	1550.39	16422.15	1817.87
Medium								
2006-07	9226.45	1803.35	14213.44	1541.80	7728.97	880.09	9020.83	1276.03
2007-08	9059.09	1741.46	13292.00	1476.89	13368.79	1266.52	11289.78	1425.53
2008-09	13290.69	2224.44	25540.00	2089.64	20589.39	1655.23	17447.51	1853.46
Large								
2006-07	8739.68	1735.30	16514.44	1651.44	9719.05	1020.50	9592.49	1340.34
2007-08	9548.26	1824.78	16034.00	1603.40	13369.88	1291.92	11826.04	1484.21
2008-09	12677.07	2228.09	27250.00	2180.00	22265.20	1741.88	17788.63	1891.25
Total								
2006-07	8660.21	1734.13	15801.54	1617.58	8170.73	924.07	8896.98	1267.65
2007-08	9448.44	1793.66	15865.92	1620.83	13707.33	1299.05	11860.93	1470.27
2008-09	13112.92	2236.88	24372.49	2001.89	20300.39	1651.85	17076.25	1845.44

The total pulse crop showed an increase in per hectare and per quintal net returns with the increase in land holding size of sampled farmers belonging to NFSM district of Amravati. The per hectare net returns from total pulses crops for the average category of farmer of Amravati district was estimated at Rs.8,897 in 2006-07, which increased to Rs.11,861 in 2007-08, and further to Rs.17,076 in 2008-09. Similarly, the per quintal net returns from total pulses crops for the average category of farmer belonging to NFSM district of Amravati was estimated at Rs.1,268 in 2006-07, which increased to Rs.1,470 in 2007-08, and further to Rs.1,845 in 2008-09.

Thus, in the total pulses farming, the average category of sampled farmer of Amravati district generated 33.31 per cent higher per hectare net returns in 2007-08 over 2006-07, 43.97 per cent in 2008-09 over 2007-08, and 91.93 per cent higher net returns in 2008-09 over 2006-07. Similarly, in the total pulses farming, the average category of sampled farmer of Amravati district generated 15.98 per cent higher per quintal net return in 2007-08 over that of 2006-07, 25.52 per cent in 2008-09 over that of 2007-08, and 45.58 per cent higher net returns in 2008-09 over that of 2006-07. The rise in yield level and higher prices on offer for pulses crops in Amravati district could be the reasons for higher amount of net profit generated from pulses crop farming since both net returns per hectare and per quintal from total pulses crops increased substantially in 2008-09 over that of 2006-07, which also show positive impact of NFSM programme on pulses farming in the NFSM district of Amravati of Maharashtra.

The pulses crops cultivated by the sampled farmers of non-NFSM district of Beed also encompassed mung and tur in kharif season and gram in rabi season. The estimates relating to per hectare net returns as well as per quintal net returns for various pulse crops viz. mung, tur and gram, and also for total pulse crops with respect to various categories of sampled farmers of Beed district for the reference years 2006-07, 2007-08 and 2008-09 are furnished in Table 6.

Although the sampled farmers of non-NFSM district of Beed allocated significant area under mung crop cultivation, the profitability in the cultivation of this crop differed across various categories of farmers. However, in general, the average category of sampled farmer of Beed district showed a net per hectare return from mung crop cultivation to the tune of Rs.8,851 in 2006-07, Rs.9,238 in 2007-08, and Rs.13,212 in 2008-09, indicating about 49 per cent higher net return in mung crop cultivation in 2008-09 over that of 2006-07 (Table 6). The returns from mung crop not only increased on per hectare basis but also on per quintal basis during the period between 2006-07 and 2008-09. In the case of average category of sampled farmer of Beed district, the per quintal net return from mung crop was estimated at Rs.1,364 in 2006-07, Rs.1,273 in 2007-08, and Rs.1,750 in 2008-09, showing 28 per cent rise per quintal net return from mung crop in 2008-09 over that of 2006-07.

All the categories of sampled farmers drawn from the non-NFSM district of Beed were also found to cultivate tur crop on their farms and area allocation under this crop was quite high for various categories of farmers. Although no discernable trend was noticed in terms of net

returns emanating in the cultivation of tur crop across various categories of farmers, the average category of sampled farmer of Beed district showed an increase in per hectare net returns from tur crop from Rs.14,083 in 2006-07 to Rs.14,386 in 2007-08, and further to Rs.17,302 in 2008-09 (Table 6). The average category of sampled farmer of Beed district showed a marginal decline in per quintal net returns from tur crop from Rs.1,449 in 2006-07 to Rs.1,419 in 2007-08 with an increase in the same to Rs.1,674 in 2008-09, showing an overall rise in per quintal net returns from tur crop of the order of 16 per cent in 2008-09 over that of 2006-07.

The sampled farmers of non-NFSM district of Beed derived much lower return from gram crop cultivated during rabi season as compared to kharif pulses like tur and mung since per hectare net returns from gram crop for the average category of sampled farmers of Beed district worked out at Rs.7,220 in 2006-07, Rs.10,842 in 2007-08, and Rs.12,467 in 2008-09 (Table 4.15). However, the average category of sampled farmer derived 73 per cent higher per hectare net return from gram crop in 2008-09 over that of 2006-07. Similarly, the gram crop showed lower per quintal net return as compared to tur and mung crop. The per quintal net return from gram crop with respect to the average category of sampled farmer of Beed district was estimated at Rs.997 in 2006-07, Rs.1,360 in 2007-08, and Rs.1,486 in 2008-09, which though again showed 49 per cent rise in per quintal net returns from gram crop in 2008-09 over that of 2006-07.

Table 6: Profitability in Pulses Crops Farming: Non-NFSM Beed District

(Return in Rupees)

	Mung		Tur		Gram		Total Pulses	
Category/ Year	Net Returns per Hectare	Net Returns Per Quintal	Net Returns per Hectare	Net Returns Per Quintal	Net Returns per Hectare	Net Returns Per Quintal	Net Returns per Hectare	Net Returns Per Quintal
Marginal								
2006-07	9295.00	1369.79	15246.68	1661.30	6713.69	902.32	9812.87	1227.97
2007-08	9184.29	1428.67	15572.69	1528.65	10712.37	1313.13	11330.62	1369.3
2008-09	11735.50	1706.55	16296.30	1577.93	12208.33	1465.00	14516.64	1568.44
Small								
2006-07	11075.00	1687.62	13688.02	1365.25	7302.12	961.29	10382.44	1312.26
2007-08	9548.04	1430.65	17169.35	1602.47	11132.73	1348.18	12349.55	1457.19
2008-09	12761.85	1765.55	16862.97	1599.82	12290.82	1430.20	13209.16	1579.64
Medium								
2006-07	8104.44	1250.40	13744.19	1452.96	7172.94	956.39	10961.26	1309.53
2007-08	9541.67	1272.22	12670.58	1244.50	11327.38	1359.29	12034.84	1275.09
2008-09	12749.58	1654.00	17086.33	1641.63	13136.94	1500.00	14303.21	1590.36
Large								
2006-07	8656.25	1385.00	14225.95	1462.11	7399.38	1064.18	8885.69	1316.15
2007-08	9080.43	1193.43	14844.38	1532.32	10706.84	1370.48	10986.38	1363.37
2008-09	14663.08	1815.43	18175.71	1789.17	12353.26	1515.33	13981.77	1633.03
Total								
2006-07	8850.83	1364.27	14083.30	1448.71	7220.39	996.90	9750.19	1243.27
2007-08	9238.47	1272.67	14385.96	1418.56	10842.11	1359.92	11487.36	1363.84
2008-09	13212.00	1749.93	17301.95	1674.22	12467.00	1486.17	13828.51	1602.72

The general scenario with all the pulses crops put together reveled a steady rise in per hectare as well per quintal net returns during the period between 2006-07 and 2008-09 with rise in the same being more sharp between 2007-08 and 2008-09. The average category of farmer of

non-NFSM district of Beed district showed an increase in per hectare net returns from total pulses crops from Rs.9,750 in 2006-07 to Rs.11,487 in 2007-08, and further to Rs.13,829 in 2008-09, showing 42 per cent rise in per hectare net returns from total pulses crops cultivation in 2008-09 over that of 2006-07 (Table 7). Further, it is to be noted that for the average category of sampled farmers belonging to non-NFSM district of Beed, the total pulses crops yielded a per quintal net returns to the tune of Rs.1,243 in 2006-07, Rs.1,364 in 2007-08, and Rs.1,603 in 2008-09, revealing 10 per cent rise in per quintal net returns from total pulse crops in 2007-08 over that of 2006-07, 18 per cent rise in the same in 2008-09 over that of 2007-08, and 29 per cent rise in the same in 2008-09 over that of 2006-07.

It deserves mention here that tough pulses crop farming was lucrative proposition in both NFSM district of Amravati and non-NFSM district of Beed, the amount of net profit involved in the cultivation of pulses crops stood at much higher in the NFSM district of Amravati as against the non-NFSM district of Beed. The extent of net returns per hectare as well as per quintal from pulses crops stood at quite high in 2008-09 as compared to 2007-08 and 2006-09, especially in the NFSM district of Amravati.

The comparative analysis drawn from the NFSM district of Amravati and non-NFSM district of Beed clearly shows positive impact of NFSM programme in raising various pulses crops since the net returns from these crops are not only higher in NFSM district of Amravati as against non-NFSM district of Beed but net returns from pulses have grown very sharply in 2008-09 over that of 2007-08, especially in NFSM district of Amravati. In fact, the farmers belonging to NFSM district of Amravati derived 44 per cent higher net returns from pulses crop cultivation in 2008-09 over that of 2007-08 as against only 20 per cent higher net returns being generated from pulses crop cultivation in non-NFSM district of Beed in 2008-09 over that of 2007-08.

Changing Pattern of Pulses Yield

Since one of the chief objectives of NFSM programme for pulses has been to augment pulses production through rise in their yield levels, it is, therefore, thought prudent to see as to how far the programme is successful in fulfilling this objective. The estimates relating to yield levels of pulses crops for various categories of sampled farmers belonging to both NFSM district of Amravati and non-NFSM district of Beed encompassing the period between 2006-07 and 2008-09 are brought out/compared in Table 7.

Although the sampled farmers belonging to non-NFSM district of Beed have shown higher levels of yield on mung crop as against the sampled farmers of NFSM district of Amravati during the period between 2006-07 and 2008-09, a steady rise in yield levels of mung crop is also noticed on the sampled farms of Amravati district during this period. In general, the yield level of mung crop for the average category of sampled farmers of Amravati district has increased from about 5 quintals/ hectare in 2006-07 to nearly 6 quintals/ hectare in 2008-09, showing about 17 per cent rise in the same between 2006-07 and 200809. On the other hand, this increase in yield

level of mung crop for the average category of sampled farmers of Beed district is noticed from about 6.5 quintals/ hectare in 2006-07 to 7.5 quintals/ hectare in 2008-09, showing 16 per cent rise in the same between 2006-07 and 2008-09. Thus, the rise in yield level of mung crop during the given period is by and large the same for the sampled farmers belonging to NFSM district of Amravati and non-NFSM district of Beed, though sampled farmers of Beed district have shown higher absolute yield level for mung crop during the given period.

Table 7: Changing Pattern of Yield of Pulses Crops on Sampled Farms: 2006-07 to 2008-09

(Yield in Quintals/Hectare)

Household Category	NFSM-Amravati District			Non-NFSM-Beed District		
	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09
Mung						
Marginal	4.688	5.143	5.820	6.785	6.428	6.875
Small	4.970	5.463	6.038	6.563	6.675	7.228
Medium	5.118	5.203	5.975	6.483	7.500	7.708
Large	5.038	5.233	5.690	6.250	7.608	8.078
All	4.995	5.268	5.863	6.488	7.275	7.550
Tur						
Marginal	10.000	10.000	12.500	9.475	10.188	10.328
Small	10.308	10.000	11.975	10.025	10.715	10.540
Medium	9.220	9.000	12.223	9.460	10.128	10.408
Large	10.000	10.000	12.500	9.730	9.688	10.158
All	9.768	9.788	12.175	9.640	10.140	10.335
Gram						
Marginal	8.220	11.035	11.970	7.440	8.158	8.333
Small	8.720	10.500	11.490	7.595	8.258	8.595
Medium	8.783	10.555	12.440	7.500	8.333	8.758
Large	9.525	10.350	12.783	6.953	7.813	8.153
All	8.843	10.553	12.305	7.243	7.973	8.388

Unlike mung crop, the sampled farmers of Amravati district have shown significantly high levels of yield of tur crop as against the sampled farmers of Beed district during the period between 2006-07 and 2008-09. Not only this, there has been substantial increase in yield level of tur crop on the sampled farms belonging to the farmers of Amravati district. The average category of sampled farmers of Amravati district showed the yield of tur crop to increase from about 10 quintals/ hectare in 2006-07 to about 12 quintals/ hectare in 2008-09, showing thereby nearly 25 per cent rise in the same between 2006-07 and 2008-09. Contrary to this, the yield level of tur crop for the average category of sampled farmer of Beed district remained stagnant at around 10 quintals/ hectare during the given period of time. Further, among various pulses crops, gram crop has shown sharper increase in yield level for various categories of sampled farmers of Amravati district. This is concomitant from the fact that the average category of sampled farmers of

Amravati district showed the yield of gram crop to increase from about 9 quintals/ hectare in 2006-07 to over 12 quintals/ hectare in 2008-09, showing thereby about 39 per cent rise in the same between 2006-07 and 2008-09. The sampled farmers of non-NFSM district of Beed also showed marginal increase in yield level of gram crop, which increased from 7.2 quintals/ hectare in 2006-07 to 8.4 quintals/ hectare in 2008-09.

The foregoing observation clearly underscore the fact that the NFSM programme for pulses crops was successful in augmenting yield levels of various pulses crops cultivated on the sampled farms belonging to the farmers of Amravati district, especially with respect to yield levels of tur and gram crops. However, the impact of the programme is not seen to be very effective in the case of mung crop cultivated on the farms belonging to the farmers of Amravati district since sampled farmers of non-NFSM district of Beed have still shown higher level of mung crop yield during the period between 2006-07 and 2008-09, despite steady rise in yield levels of mung crop on the sampled farms of Amravati district.

Assistance Received under NFSM-Pulses

At the time of survey, various categories of sampled households belonging to the NFSM district of Amravati were asked to indicate as to whether they received any assistance under NFSM-pulses programme, and the responses in this respect received from the sampled farmers are shown in Table 8.

Table 8: Received any Assistance under NFSM – Pulses: NFSM Amravati District

Household Category	No. of Households Received Assistance	Total No. of Households in the Size-group	% of Household Assisted
Marginal	10	15	66.67
Small	16	19	84.21
Medium	7	10	70.00
Large	5	6	83.33
All	38	50	76.00

The response with respect to assistance under NFSM-pulses programme was quite positive since 76 per cent of the total sampled farmers belonging to the NFSM district of Amravati aired their view in favour of receiving assistance under the programme and this proportion among various categories stood at 67 per cent in marginal category, 84 per cent in small, 70 per cent in medium and 83 per cent in large category.

Under NFSM-pulses, the farmers are provided various types of assistance and these mainly include: (a) breeder/foundation/certified seeds, (b) assistance on Integrated Nutrient Management (INM) – micronutrients/line/gypsum, etc., (c) assistance on Integrated Pest Management (IPM) - micronutrients/line/gypsum IPM, (d) equipment like seed drills, pumpsets, sprinklers, conoweeder, Knapp-sack sprayers, (e) demonstration of new ICRISAT technologies or Bluebull menace, (f) training under Farmers' Training component, etc. The responses of the sampled households drawn from the NFSM district of Amravati were recorded in terms of types

of assistance received by them and these responses for various categories of households are brought out in Table 9.

Table 9: Distribution of Households by Type of Assistance: NFSM Amravati District

Household Category	No. of Households Assisted							
	Seeds	Integrated Nutrient Management (INM)	Integrated Pest Management (IPM)	Equipment like Seed Drills, etc.	Demonstration	Training	Other	Total
Marginal	10	4	2	3	-	1	-	20
Small	14	5	2	6	-	2	-	29
Medium	6	3	-	2	-	-	-	11
Large	4	2	-	-	-	-	-	6
All	34	14	4	11	-	3	-	66
	% Farmers Assisted to Total Farmers in Size Group							
Marginal	50.00	20.00	10.00	15.00	-	5.00	-	100.00
Small	48.28	17.24	6.90	20.69	-	6.90	-	100.00
Medium	54.55	27.27	-	18.18	-	-	-	100.00
Large	66.67	33.33	-	-	-	-	-	100.00
All	51.52	21.21	6.06	16.67	-	4.55	-	100.00

Note: There is overlapping of households as same household has received no. of assistance and, therefore, the total is exceeding the actual sample size of households

About 52 per cent of the sampled households of NFSM district of Amravati were found to air their view in favour of receiving improved varieties of seeds of pulses crops under NFSM programme, 21 per cent received assistance on INM, 6 per cent received assistance on IPM, 17 per cent received various equipments, and about 5 per cent received training under the programme (Table 9). The proportion of sampled households showing receipt of improved varieties of seeds of pulse crops was 50 per cent in marginal category, 48 per cent in small, 55 per cent in medium and 67 per cent in large category.

Problems with Improved Varieties

Although improved varieties of pulses are favoured by the farmers due to their higher levels of yield, there are number of problems in the cultivation of these high yielding pulses crops. Various categories of farmers encounter with different kinds of problems in the cultivation of improved varieties of pulses. The responses of the sampled farmers belonging to the NFSM district of Amravati were also recorded in terms of various problems faced by them in the cultivation various pulses crops and these problems were then ranked from 1 to 6. The reported responses with respect to major problems faced by the sampled farmers of NFSM district of Amravati and non-NFSM district of Beed in the cultivation various pulses crops and their ranking in this respect are brought out in Table 10 with all the categories of sampled farmers put together.

In the cultivation of improved varieties of pulses crops, the major problems encountered by the sampled farmers of NFSM district of Amravati and non-NFSM district of Beed were: (a) non availability of improved varieties, (b) availability of improved varieties but not on time, (c) higher expenses involved in improved varieties, (d) improved varieties requiring larger doses of other inputs, (e) much lower yield than expected, and (f) inadequacy of pest resistance measures

towards cultivation of improved varieties of pulses crop. The sampled farmers of NFSM district of Amravati aired varying opinion about these six major problems faced by them in the cultivation of improved varieties of pulses crops (Table 10).

Table 10: Households Reporting Problems with Improved Varieties of Pulses: NFSM Amravati District

Problem	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Mung							
Not available at all	5	3	7	4	5	3	27
Available but not on time	6	3	4	9	4	2	28
Very Expensive	11	11	4	5	-	1	32
Need large doses of other inputs	10	8	2	3	9	-	31
Much lower yield than expected	2	8	10	2	6	4	32
Pest resistance not adequate	4	1	3	4	2	14	28
Total	35	35	30	27	26	25	178
Gram							
Not available at all	-	3	7	8	6	3	27
Available but not on time	4	6	2	8	5	3	28
Very Expensive	18	4	3	1	2	3	31
Need large doses of other inputs	3	8	7	6	2	4	30
Much lower yield than expected	8	6	3	-	10	4	31
Pest resistance not adequate	1	3	7	6	2	11	30
Total	34	30	29	29	27	28	177
Tur							
Not available at all	2	3	1	2	-	2	10
Available but not on time	-	-	3	4	3	-	10
Very Expensive	4	4	1	-	1	2	12
Need large doses of other inputs	3	1	1	-	5	1	11
Much lower yield than expected	2	2	3	1	1	-	9
Pest resistance not adequate	2	1	-	1	1	5	10
Total	13	11	9	8	11	10	62

Table 10 (a): % Distribution of Households Reporting Problems with Improved Varieties of Pulses: NFSM Amravati District

Problem	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 6	Total
Mung							
Not available at all	18.52	11.11	25.93	14.81	18.52	11.11	100.00
Available but not on time	21.43	10.71	14.29	32.14	14.29	7.14	100.00
Very Expensive	34.38	34.38	12.50	15.63	-	3.13	100.00
Need large doses of other inputs	32.26	25.81	6.45	9.68	29.03	-	100.00
Much lower yield than expected	6.25	25.00	31.25	6.25	18.75	12.50	100.00
Pest resistance not adequate	14.29	3.57	10.71	14.29	7.14	50.00	100.00
Total	19.66	19.66	16.85	15.17	14.61	14.04	100.00
Gram							
Not available at all	-	11.11	25.93	29.63	22.22	11.11	100.00
Available but not on time	14.29	21.43	7.14	28.57	17.86	10.71	100.00
Very Expensive	58.06	12.90	9.68	3.23	6.45	9.68	100.00
Need large doses of other inputs	10.00	26.67	23.33	20.00	6.67	13.33	100.00
Much lower yield than expected	25.81	19.35	9.68	-	32.26	12.90	100.00
Pest resistance not adequate	3.33	10.00	23.33	20.00	6.67	36.67	100.00
Total	19.21	16.95	16.38	16.38	15.25	15.82	100.00
Tur							
Not available at all	20.00	30.00	10.00	20.00	-	20.00	100.00
Available but not on time	-	-	30.00	40.00	30.00	-	100.00
Very Expensive	33.33	33.33	8.33	-	8.33	16.67	100.00
Need large doses of other inputs	27.27	9.09	9.09	-	45.45	9.09	100.00
Much lower yield than expected	22.22	22.22	33.33	11.11	11.11	-	100.00
Pest resistance not adequate	20.00	10.00	-	10.00	10.00	50.00	100.00
Total	20.97	17.74	14.52	12.90	17.74	16.13	100.00

The expensive nature of cultivation of improved varieties of pulses and application of larger doses of other inputs in the cultivation of improved varieties were identified as the major problems faced by the households belonging to the NFSM district of Amravati. However, in the case of non-NFSM district of Beed, the major problems with respect to improved varieties were non-availability of improved varieties of seeds, untimely availability, expensive nature of improved varieties of seeds and application of large doses of other inputs in the cultivation of improved varieties of pulses.

Suggestions for Improving NFSM – Pulses

The responses of the sampled farmers drawn from the NFSM district of Amravati were also sought with respect to their own suggestion extended in favour of improving NFSM programme for pulses crops, especially with a view to make this programme more useful and meaningful, and these suggestions obtained from various categories of sampled farmers are presented in Table 11.

Table 11: Suggestions for Improving NFSM – Pulses: Farmers' Perception (Amravati District)

Sr. No.	Household Category	Suggestions
	Marginal	
1		Provision of subsidy on fertilizer
2		Reasonable rate of fertilizer
3		Extension of irrigation facilities
4		Adequate provision of improved varieties of seeds
5		Extension of irrigation facilities and subsidy of seeds, fertilizer, pesticide, implements, etc.
6		Organization of camps for the dissemination of knowledge about NFSM pulses program
7		Make available high yielding varieties of seeds; fertilizers on subsidized rate and on time
	Small	
1		Reasonable prices of seeds and fertilizers and their timely availability
3		Extension of irrigation facilities
5		Provision of automatic pump set on subsided price for tur for spraying
6		Extension of subsidy on agri impalements, improved seeds; plant protection measures
7		Extension of subsidy on seeds, sprinkler pump set and Pesticide; Provision of farm pond on farm
10		Making aware of NFSM programme to the people by arranging meetings with farmers;
12		Provide High yield variety seeds, fertilizers on subsidy; give minimum support price
	Medium	
1		Market prices be kept constant; Fertilizers prices should be less; Provide seeds on subsidy
2		Provide Irrigation facilities under the programme
4		Provide plant Protection measures and Improved Implements on Subsidy
5		Provide seeds on subsidized rates
6		Provide seeds & fertilizers and provide Irrigation facilities
7		Provide seeds & fertilizers on subsidized rates; Provide irrigation facilities; Give remunerative price
8		Provide high yielding varieties of seeds & fertilizers: Give surety of minimum support price
	Large	
1		Seeds and fertilizers should be provided on subsidized rates at door steps
2		Seed prices should be less; Required active assistant who can spread information about the Govt. policies.
3		Seeds should be provide on subsidized rates; Market price should be constant
4		Provide seeds, fertilizers and pest control measures on subsidy
5		Provide seeds, fertilizers and pest control measures on subsidy; provide Irrigation facilities; Increase market prices for pulses

Although various categories of sampled farmers drawn from the NFSM district of Amravati had aired several suggestions to improve the existing NFSM programme for pulses crops with a view to make the programme more useful to them, there was considerable overlapping in these suggestions across various categories of sampled farmers. In order to improve NFSM programme for pulses and make it more useful, the suggestions of the sampled farmers mainly revolved around extension of irrigation facilities, provision of improved varieties of seeds on subsidised rates, an element of subsidy with respect to other inputs like fertilizer, pesticides, implements and machinery, pest control measures, plant protection measures, etc, assured and remunerative market prices for various pulse crops, organizing meetings with the farmers to make them aware about the programme, timely availability of seeds, fertilizers, and other inputs, provision of automatic pump sets on subsidised rates for spraying in the cultivation of tur crop, provision of farm pond, sprinkler sets, etc.

Conclusions and Policy Implications

The study showed positive impact of NFSM programme on pulses crops cultivation in the state of Maharashtra since the element of profit involved in the cultivation of pulses crops turned out to be much higher in the NFSM district as against the non-NFSM district. Not only this, the net profit margins in the cultivation of pulses crops in NFSM district were substantially high in 2008-09 as against 2006-07 and 2007-08. The plausible reasons for rise in profit margins in the cultivation of pulses crops could be traced in rise in yield levels, higher prices on offer for pulses, adoption of improved varieties of seeds in pulses crops cultivation, area under improved varieties, higher adoption of recommended practices such as sowing, seed and other practices, including application of organic manure, chemical fertilizers, etc., assistance received under NFSM-pulses programme viz. improved varieties of seeds like breeder/foundation/certified seeds, assistance on Integrated Nutrient Management (INM) – micronutrients/line/gypsum, etc., assistance on Integrated Pest Management (IPM) - micronutrients/line/gypsum IPM, provision of equipment like seed drills, pumpsets, sprinklers, conoweeder, Knapp-sack sprayers, participation of farmers in various training programmes, reasonably assured market for the pulses produce, etc.

The initiation of NFSM-pulses would certainly pay rich dividend since the major thrust of this programme is on increasing seed replacement and the replacement of older varieties by newer ones. One of the major features of this is that it offers much more than what earlier programmes offered, especially with respect to capacity building, monitoring, planning and execution; the execution of the programme remains within the district planning framework.

End Notes:

1. India is reckoned as the largest producer and consumer of pulses in the world, accounting for about 25 per cent of global production, 27 per cent of consumption, and 34 percent of food use (Price et. al., 2003). Nevertheless, India is also the top importer pulses in the world with 11 per cent share in world pulse imports during 1995-2001. Since pulse production in India has fluctuated widely with no long-term trend, this has led to steady

decline in the per capita availability of pulses over the past 20 years or so. The per capita per day availability of pulses in India declined from 45.5 grams in 1978 to 41.1 grams in 1990 and further to 31.5 grams in 2005.

2. Several policy initiatives, projects and programmes with respect to pulses were undertaken in the past viz. All India Coordinated Pulses Improvement Project (AICPIP), National Pulses Development Programme (NPDP), Technology Mission on Pulses (TMOP), Centrally Sponsored Integrated Scheme of Oilseeds, Pulses, Oil palm and Maize (ISOPOM), etc.

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