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Impact of National Food Security Mission on Pulse Crops in Maharashtra: An Empirical Assessment

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INTRODUCTION

India at present finds itself in the paradoxical situation: endemic mass-hunger co-existing with mounting foodgrain stocks. This is despite India having a laudable food security policy, which ensures availability of foodgrains 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 coarse 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). In the late 1970s and early 1980s, 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 high yielding variety 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 not significant. In view of the fact that earlier programmes relating to pulses sector 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 three components, which include rice, wheat and pulses.

The major causes of concerns with respect to pulse 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

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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 have sufficient area allocation under pulses 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 categorisation 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 total sample 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 the cropping pattern of the sampled farmers, profitability involved in the cultivation of

pulses crops before and after the initiation of the programme, 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 the 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 in 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). 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.

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). 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 1. CROPPING PATTERN – OVER ALL SEASONS: NFSM AMRAVATI DISTRICT

(area in acres; average of 2006-07, 2007-08, 2008-09)

Category (1)	Area sown												
	Kharif season						Rabi season						
	Other Crops			Pulses			Pulse	Other		Total			
Soybean (2)	Jowar (3)	Cotton (4)	Bajra (5)	Others (6)	Total (7)	Mung (8)	Tur (9)	Total (10)	G. Total (11)	Gram (12)	Sunflower (13)	Total (14)	
Marginal	2.75 (10.35)	1.33 (5.00)	1.00 (3.76)	-	0.67 (2.52)	5.75 (21.63)	19.25 (72.42)	1.58 (5.94)	20.83 (78.37)	26.58 (100.0)	21.33 (89.81)	2.42 (10.19)	23.75 (100.0)
Small	3.52 (5.59)	4.49 (7.13)	5.23 (8.30)	0.87 (1.38)	4.24 (6.73)	18.34 (29.11)	39.45 (62.62)	5.22 (8.29)	44.66 (70.89)	63.00 (100.0)	39.69 (95.68)	1.79 (4.32)	41.48 (100.0)
Medium	3.50 (5.13)	5.25 (7.69)	7.00 (10.26)	-	3.00 (4.40)	18.75 (27.47)	44.08 (64.59)	5.42 (7.94)	49.50 (72.53)	68.25 (100.0)	43.17 (95.57)	2.00 (4.43)	45.17 (100.0)
Large	4.33 (6.19)	6.50 (9.30)	6.67 (9.54)	-	0.33 (0.47)	17.83 (25.51)	47.40 (67.81)	4.67 (6.68)	52.07 (74.49)	69.90 (100.0)	45.50 (95.13)	2.33 (4.87)	47.83 (100.0)
Total	14.10 (6.19)	17.57 (7.71)	19.90 (8.74)	0.87 (0.38)	8.24 (3.62)	60.67 (26.64)	150.18 (65.94)	16.88 (7.41)	167.06 (73.36)	227.74 (100.0)	149.69 (94.60)	8.54 (5.40)	158.23 (100.0)

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 2. CROPPING PATTERN – OVER ALL SEASONS: NON-NFSM BEED DISTRICT

(area in acres; average of 2006-07, 2007-08, 2008-09)

Category (1)	Area sown													
	Kharif season						Pulses				Rabi season			
	Other crops			Pulses			G.	Pulse	Other		Total			
Soybean (2)	Jowar (3)	Cotton (4)	Bajra (5)	Others (6)	Total (7)	Mung (8)	Tur (9)	Total (10)	Total (11)	Gram (12)	Sugar- cane (13)	Other (14)	Total (15)	
Marginal	1.50 (6.79)	0.43 (1.95)	11.32 (51.22)	0.83 (3.76)	-	14.08 (63.71)	2.42 (10.95)	5.60 (25.34)	8.02 (36.29)	22.10 (100.0)	8.37 (84.80)	1.50 (15.20)	-	9.87 (100.0)
Small	7.33 (12.09)	-	23.75 (39.16)	4.17 (6.88)	-	35.25 (58.12)	15.50 (25.56)	9.90 (16.32)	25.40 (41.88)	60.65 (100.0)	18.37 (62.21)	5.33 (18.05)	5.83 (19.74)	29.53 (100.0)
Medium	5.67 (8.02)	0.92 (1.30)	38.67 (54.67)	0.17 (0.24)	-	45.42 (64.22)	7.25 (10.25)	18.07 (25.55)	25.32 (35.80)	70.73 (100.0)	11.57 (37.77)	6.17 (20.14)	12.89 (42.09)	30.63 (100.0)
Large	10.08 (11.11)	-	37.00 (40.77)	15.33 (16.89)	-	62.42 (68.78)	14.67 (16.17)	13.67 (15.06)	28.33 (31.22)	90.75 (100.0)	47.33 (39.20)	53.33 (44.17)	20.09 (16.63)	120.75 (100.0)
Total	24.58 (10.06)	1.35 (0.55)	110.73 (45.34)	20.50 (8.39)	-	157.17 (64.35)	39.83 (16.31)	47.24 (19.34)	87.07 (35.65)	244.24 (100.0)	85.63 (44.88)	66.33 (34.77)	38.82 (20.35)	190.78 (100.0)

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.

The foregoing observations bring us closer to the fact that the cropping pattern of the 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.

Profitability in Pulses Crops Cultivation

The extent of profit involved in the cultivation of pulses 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 obtained in terms of profitability of crops before initiation of NFSM for pulses crops and the reference year 2008-09 shows the scenario obtained in this respect after the initiation of NFSM for pulses crops, i.e., the impact of the NFSM programme. 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 and Beed districts coupled with net returns per quintal emanating from total pulses crops are provided in Table 3 and Table 4.

TABLE 3. PROFITABILITY IN PULSES CROPS FARMING: NFSM AND NON-NFSM DISTRICTS

Category/ Year	NFSM Amravati District				Non-NFSM Beed District			
	Mung (1)	Tur (2)	Gram (3)	Total Pulses (4)	Mung (5)	Tur (6)	Gram (7)	Total Pulses (8)
<i>(net return in Rs /ha)</i>								
Marginal								
2006-07	7452.47	15488.00	7275.68	7595.96	9295.00	15246.68	6713.69	9812.87
2007-08	9551.43	16515.00	15040.69	12828.08	9184.29	15572.69	10712.37	11330.62
2008-09	12615.20	23217.50	18333.04	15590.14	11735.50	16296.30	12208.33	14516.64
Small								
2006-07	8564.60	17540.35	7907.53	8801.57	11075.00	13688.02	7302.12	10382.44
2007-08	10172.06	17554.38	13764.62	12301.93	9548.04	17169.35	11132.73	12349.55
2008-09	13872.35	23365.13	17813.46	16422.15	12761.85	16862.97	12290.82	13209.16
Medium								
2006-07	9226.45	14213.44	7728.97	9020.83	8104.44	13744.19	7172.94	10961.26
2007-08	9059.09	13292.00	13368.79	11289.78	9541.67	12670.58	11327.38	12034.84
2008-09	13290.69	25540.00	20589.39	17447.51	12749.58	17086.33	13136.94	14303.21
Large								
2006-07	8739.68	16514.44	9719.05	9592.49	8656.25	14225.95	7399.38	8885.69
2007-08	9548.26	16034.00	13369.88	11826.04	9080.43	14844.38	10706.84	10986.38
2008-09	12677.07	27250.00	22265.20	17788.63	14663.08	18175.71	12353.26	13981.77
Total								
2006-07	8660.21	15801.54	8170.73	8896.98	8850.83	14083.30	7220.39	9750.19
2007-08	9448.44	15865.92	13707.33	11860.93	9238.47	14385.96	10842.11	11487.36
2008-09	13112.92	24372.49	20300.39	17076.25	13212.00	17301.95	12467.00	13828.51

TABLE 4. PROFITABILITY IN PULSES CROPS FARMING: NFSM AND NON-NFSM DISTRICTS

Categor/ Year (1)	<i>(net return in Rs./qtl.)</i>							
	NFSM Amravati District				Non-NFSM Beed District			
	Mung (2)	Tur (3)	Gram (4)	Total Pulses (5)	Mung (6)	Tur (7)	Gram (8)	Total Pulses (9)
Marginal								
2006-07	1589.86	1548.80	885.04	1136.73	1369.79	1661.30	902.32	1227.97
2007-08	1857.22	1651.50	964.58	1508.65	1428.67	1528.65	1313.13	1369.3
2008-09	2167.76	1857.40	1531.57	1750.25	1706.55	1577.93	1465.00	1568.44
Small								
2006-07	1723.46	1701.79	906.87	1255.8	1687.62	1365.25	961.29	1312.26
2007-08	1862.27	1755.44	1310.95	1509.82	1430.65	1602.47	1348.18	1457.19
2008-09	2298.13	1951.19	1550.39	1817.87	1765.55	1599.82	1430.20	1579.64
Medium								
2006-07	1803.35	1541.80	880.09	1276.03	1250.40	1452.96	956.39	1309.53
2007-08	1741.46	1476.89	1266.52	1425.53	1272.22	1244.50	1359.29	1275.09
2008-09	2224.44	2089.64	1655.23	1853.46	1654.00	1641.63	1500.00	1590.36
Large								
2006-07	1735.30	1651.44	1020.50	1340.34	1385.00	1462.11	1064.18	1316.15
2007-08	1824.78	1603.40	1291.92	1484.21	1193.43	1532.32	1370.48	1363.37
2008-09	2228.09	2180.00	1741.88	1891.25	1815.43	1789.17	1515.33	1633.03
Total								
2006-07	1734.13	1617.58	924.07	1267.65	1364.27	1448.71	996.90	1243.27
2007-08	1793.66	1620.83	1299.05	1470.27	1272.67	1418.56	1359.92	1363.84
2008-09	2236.88	2001.89	1651.85	1845.44	1749.93	1674.22	1486.17	1602.72

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 farmers 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 (Table 3). Similarly, the per quintal net returns from total pulses crops for the average category of farmers 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 (Table 4).

Thus, in the total pulses farming, the average category of sampled farmers 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 showed 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. 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. The general scenario with all the pulses crops put together revealed 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 3). 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 (Table 4).

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 and Prices

Since one of the main objectives of NFSM programme for pulses has been to augment pulses production through rise in their yield levels, it is, therefore, thought

TABLE 5. CHANGING PATTERN OF YIELD AND PRICES OF PULSES CROPS ON SAMPLED FARMS: 2006/07 – 2008/09

Household Category	(yield in quintals/hectare; prices in Rs./qtl.)												
	NFSM-Amravati District						Non-NFSM-Beed District						2008-09
	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	
Mung													
Marginal	4.688	5.143	5.820	3461	3742	3927	6.785	6.428	6.875	3295	3611	3791	
Small	4.970	5.463	6.038	3573	3729	4139	6.563	6.675	7.228	3340	3594	3951	
Medium	5.118	5.203	5.975	3715	3771	4214	6.483	7.500	7.708	3314	3800	4154	
Large	5.038	5.233	5.690	3658	3802	4254	6.250	7.608	8.078	3400	3693	4219	
All	4.995	5.268	5.863	3625	3766	4172	6.488	7.275	7.550	3344	3669	4070	
Tur													
Marginal	10.000	10.000	12.500	2500	2700	2750	9.475	10.188	10.328	2481	2357	2868	
Small	10.308	10.000	11.975	2696	2913	3007	10.025	10.715	10.540	2651	2717	2972	
Medium	9.220	9.000	12.223	2815	2793	3145	9.460	10.128	10.408	2634	2787	3063	
Large	10.000	10.000	12.500	2767	2783	3200	9.730	9.688	10.158	2711	2742	3163	
All	9.768	9.788	12.175	2746	2803	3063	9.640	10.140	10.335	2629	2740	3047	
Gram													
Marginal	8.220	11.035	11.970	1895	2199	2379	7.440	8.158	8.333	1775	2097	2365	
Small	8.720	10.500	11.490	1938	2241	2512	7.595	8.258	8.595	1938	2059	2406	
Medium	8.783	10.555	12.440	1931	2203	2514	7.500	8.333	8.758	1965	2120	2387	
Large	9.525	10.350	12.783	2013	2254	2591	6.953	7.813	8.153	2038	2252	2495	
All	8.843	10.553	12.305	1948	2226	2528	7.243	7.973	8.388	1950	2190	2445	

prudent to analyse as to how far the programme is successful in fulfilling this objective. The estimates relating to yield levels of pulses crops along with their prices 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 5.

Although the sampled farmers belonging to non-NFSM district of Beed have shown higher levels of yield of 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. However, 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 the sampled farmers of Beed district have shown higher absolute yield level for mung crop. Further, the price received by the farmers for mung crop turned out to be higher for sampled farmers of NFSM district of Amravati as against non-NFSM district of Beed.

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. 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. Further, gram crop has shown sharper increase in yield level for various categories of sampled farmers of Amravati district. The sampled farmers of non-NFSM district of Beed also showed marginal increase in yield level of gram crop. In general, prices of all the pulse crops were higher for the sampled farmers of NFSM district of Amravati as against non-NFSM district of Beed.

The foregoing observation clearly underscores 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.

Assistance Received under NFSM-Pulses

Under NFSM-pulses, 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 6.

TABLE 6. DISTRIBUTION OF HOUSEHOLDS BY TYPE OF ASSISTANCE: NFSM AMRAVATI DISTRICT

Household Category (1)	No. of households assisted							Total (8)
	Seeds (2)	Integrated Nutrient Management (INM) (3)	Integrated Pest Management (IPM) (4)	Equipment like Seed Drills, etc. (5)	Demonstration (6)	Training (6)	Other (7)	
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
Per cent 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 had responded 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 6). 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

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 of various pulses crops and these problems were then ranked from 1 to 6, and these responses are given in Table 7.

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 7. DISTRIBUTION OF HOUSEHOLDS REPORTING PROBLEMS WITH IMPROVED VARIETIES OF PULSES: NFSM AMRAVATI DISTRICT

Problem (1)	<i>(per cent)</i>						
	Rank 1 (2)	Rank 2 (3)	Rank 3 (4)	Rank 4 (5)	Rank 5 (6)	Rank 6 (7)	Total (8)
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.

CONCLUSIONS

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 to 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 fertilisers, 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 dividends 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.

REFERENCES

- Alagh, Y.K. and P.S. Sharma (1980), "Growth of Crop Production: 1960-61 to 1978-79 – Is it Decelerating?", *Indian Journal of Agricultural Economics*, Vol. 35, No. 2, April-June, pp. 104-118.
- Bhatia, M.S. (1991), "Economic Constraints in Increasing Pulses Production", *Agricultural Situation in India*, Vol. 46, No. 5, pp. 279-284.
- Dantwala, M.L. (1978), "Future of Institutional Reform and Technical Change in Indian Agricultural Development", *Economic and Political Weekly*, Vol.13, Nos. 31, 32 and 33, Special Number (August), 1299-1306.
- Desai, Guntant M. and N.V. Namboodiri (1983), "The deceleration Hypothesis and Yield – Increasing Inputs in Indian Agriculture", *Indian Journal of Agricultural Economics*, Vol. 38, No. 4, October-December, pp. 497-508.
- Moorti, T.V., K.D. Sharma and D.R. Thakur (1991), "Trends in the Production of Pulses and Oilseeds in Himachal Pradesh", *Agricultural Situation in India*, Vol. 46, No. 5, pp. 303-308.