

Socio-economic transformation through National Food Security Mission in Uttar Pradesh and Karnataka, India

Bhagya Vijayan¹, Manjeet Singh Nain^{2,*}, Rashmi Singh² and N. V. Kumbhare²

¹ICAR-Central Soil Salinity Research Institute, Karnal 132 001, India

²ICAR-Indian Agricultural Research Institute, Pusa, New Delhi 110 012, India

Augmenting agricultural productivity is the goal of the National Food Security Mission (NFSM), Government of India. The aim of the present study was to analyse the socio-economic changes brought about by NFSM in 2022 in Uttar Pradesh (UP) and Karnataka. For this, 160 beneficiary farmers and 80 non-beneficiary farmers from both states were part of personal interviews and focused group discussions. The socio-economic transformation was higher for beneficiary farmers in terms of annual income, occupational status, crop diversification, earning members, material possession, agricultural productivity and access to the programme than for non-beneficiary farmers of both states. Comparative analyses of the transformation of beneficiary farmers in Karnataka and UP revealed significant changes in the socio-economic indicators, except earning members, education, social participation and agricultural productivity. The changes brought about by this Mission, before and after its launch, revealed a significantly higher socio-economic impact on the beneficiary farmers.

Keywords: Agricultural productivity, beneficiary and non-beneficiary farmers, National Food Security Mission, socio-economic transformation.

ALBEIT a plethora of agricultural development programmes exist, the real impetus in agriculture development was seen only during the late 1990s. The 21st century marked the advent of several programmes to boost agriculture, such as market-led extension, digitalization of agriculture, public-private partnership (PPP) and convergence of Agriculture Technology Management Agency-Krishi Vigyan Kendra (ATMA-KVK) through the National Mission on Agricultural Extension Technology¹. The multiplicity of agricultural development programmes in the production of food grains, vegetables, fruits, eggs, meat, fish, flowers, wool, oilseeds and pulses, and the standard operating procedures linked with each of the programmes make it difficult to avail of their proper benefits. The ever-changing programmes and the additional benefits extended by some of the state governments (locality-wise) sometimes remain unutilized or

underutilized due to a lack of awareness by farmers and implementing agencies. These programmes are often retracted, revamped, or entirely new ones are rolled out.

Indian agriculture benefitted greatly from the green revolution in the 1960s. However, during the execution of policies, the crucial aspect of the nutritional security of the general populace was always overlooked. The National Food Security Mission (NFSM), GoI, tackles this issue on several fronts. India is now moving towards self-sufficiency (Atmanirbhar Bharat)². The major goals of NFSM are to boost production and ensure nutritional security. The problems existing in nutritional and food security are addressed by numerous sub-programmes under NFSM. To assess whether the implementation of NFSM aligns with the needs of farmers and the general public in terms of agricultural input and market demands for farmers and nutritional security for the general public, an effort has been made to stay current with these trends. The National Development Council (NDC), in its 53rd meeting held on 29 May 2007, adopted a resolution to launch a Food Security Mission comprising rice, wheat and pulses to increase the production of rice by 10 million tonnes, wheat by 8 million tonnes and pulses by 2 million tonnes by the end of the 11th Five-Year Plan (2011–12)^{3,4}. Accordingly, a centrally sponsored scheme, NFSM, was launched in October 2007. To face new challenges in agriculture, the Mission is being continued during the 12th Five-Year Plan with new targets of additional production of 25 million tonnes of food grains comprising 10 million tonnes of rice, 8 million tonnes of wheat, 4 million tonnes of pulses and 3 million tonnes of coarse cereals. NFSM during the 12th Five-Year Plan will have five components, i.e. (i) NFSM-rice, (ii) NFSM-wheat, (iii) NFSM-pulses, (iv) NFSM-coarse cereals and (v) NFSM-commercial Crops^{2,5,6}. In this study, we examine the dynamics of the Mission in bringing socio-economic transformation in the lives of the farming community.

Methodology

The present study used the exploratory research design. Uttar Pradesh (UP) and Karnataka were selected for the study. UP belongs to the group of states with a share of

*For correspondence. (e-mail: msnain@gmail.com)

20–29% in agriculture and allied activities, while Karnataka belongs to the group with 15–19% (GSDP). UP recorded 23% and Karnataka 15% in respective state GDP share in 2013–2014. The agricultural growth rate of UP was 3.0% per year (at 2011–12 constant prices) between 2005–06 and 2018–19, compared to 3.6% for India as a whole. Compared to the rest of India over the previous two decades, agricultural growth in UP has been somewhat less erratic⁷. Research has shown the higher nutritional vulnerability of UP among the northern states, followed by Bihar⁸. Similar nutritional vulnerability status was recorded in rural societies studied in Karnataka⁹. Despite being agriculturally active, a major disparity in the allocation and channelization of funds (agricultural development programmes) was observed in UP and Karnataka¹⁰. These two states have been selected based on their higher stake in India's agriculture GDP, nutritionally vulnerable status, less erratic agricultural growth, a greater number of NFSM sub-programmes under implementation, beneficiary ghosting reportings being high and larger area under rainfed agriculture.

From each of the two selected states, two districts were selected, and two villages from each district were selected. From UP, Gonda and Lalitpur districts were selected and from Karnataka, Kolar and Chikkaballapur. The criteria chosen for selection included whether the districts were drought-prone but actively participating in NFSM activities and whether they had initiated non-conventional cropping and promotion of millets or pulse cropping under NFSM for nutritional security.

Chikkaballapur and Kolar districts are agriculturally active regions which are also actively participating in the implementation of programmes of NFSM, but are drought-prone¹¹. Gonda and Lalitpur districts were seen to focus on non-conventional crops and promoting pulses⁷, hence featuring in the state's efforts to achieve food and nutritional security.

Forty beneficiary farmers and 20 non-beneficiary farmers were selected from each district, totalling a sample size of 240 farmers. A detailed interview schedule was prepared to analyse the extent of utilization of the benefits of NFSM. Personal interviews and focused group discussions with the beneficiary and non-beneficiary farmers were conducted to collect data. Socio-economic transformation incorporates the tangible and intangible positive changes on the beneficiaries as a result of availing of benefits and access to agricultural development programmes. Variables like annual income, crop diversification, earning members, occupational status and material possession were analysed for economic indicators. Indicators like education, agricultural productivity, social participation and access to the programme were analysed for social indicators. The socio-economic indicators were chosen based on a thorough review of the literature and expert consultation. Socio-economic changes before and after the launch of NFSM were analysed using the Wilcoxon sign rank test, while socio-economic changes between the beneficiary and non-beneficiary farmers were compared using the Mann-Whitey *U* test. Beneficiary

farmers of UP and Karnataka were also compared to project the difference in regional changes in socio-economic indicators by NFSM. Correlation analysis of socio-economic indicators to overall socio-economic impact helped analyse the interrelation between the overall socio-economic transformation and related socio-economic variables.

Results and discussion

Comparative analysis of the beneficiary and non-beneficiary farmers

For NFSM, nine socio-economic factors were considered: annual income, education, occupational status, earning members, material possession, social participation, agricultural productivity, crop diversification and programme access. It is evident from Table 1 that for the beneficiary and non-beneficiary farmers from UP, among the socio-economic variables in annual income (mean rank = 74.60), occupational status (mean rank = 65.0), earning members (mean rank = 66.72), material possession (mean rank = 60.30), agricultural productivity (mean rank = 77.20), crop diversification (mean rank = 65.30) and access to the programme (mean rank = 78.81), were higher for beneficiary farmers. While education (mean rank = 62.91) and social participation (mean rank = 64.00) registered a reverse trend as the mean ranks were higher for non-beneficiary farmers. For Karnataka, annual income (mean rank = 76.70), occupational status (mean rank = 64.75), earning members (mean rank = 73.38), material possession (mean rank = 76.45), agricultural productivity (mean rank = 78.80), crop diversification (mean rank = 77.82) and access to the programme (mean rank = 80.09), were higher for beneficiary farmers. While education (mean rank = 62.59) and social participation (mean rank = 58.75) registered a reverse trend, as the mean ranks were higher for non-beneficiary farmers. It is evident that NFSM interventions have augmented the income as well as the improved socio-economic status of the beneficiary farmers.

The reverse trend of social participation and education could be due to the effect of literacy and other developmental projects in the study area. Maheshwari and Bairati¹² reported similar findings, except for social participation and education in their study, that there was socio-economic transformation after the NFSM interventions.

Comparative analysis of beneficiary farmers of NFSM

The Mann-Whitney *U* test analysis revealed that for annual income (mean rank = 90.48), crop diversification (mean rank = 107.50), social participation (mean rank = 89.50) and agricultural productivity (mean rank = 84.00), the Karnataka beneficiary farmers fared comparatively better, while in material possession (mean rank = 94.20) the beneficiary

Table 1. Socio-economic transformation of beneficiary farmers (BF) and non-beneficiary (NBF) farmers of National Food Security Mission (NFSM), Government of India

Variables	Mean rank		Mann-Whitney <i>U</i> value	Z value	Asymp. sigma (two-tailed)
	BF (<i>n</i> ₁ = 80)	NBF (<i>n</i> ₂ = 40)			
Uttar Pradesh (UP)					
Annual income	74.60	32.30	472.00	-6.857	0.000*
Education	52.29	62.91	1503.50	-0.585	0.559
Occupational status	65.00	51.50	1240.00	-2.470	0.000*
Crop diversification	65.30	50.90	1216.00	-3.452	0.001*
Earning members	66.72	48.05	1102.00	-4.831	0.000*
Material possession	60.30	59.09	1849.00	-3.118	0.000*
Social participation	58.75	64.00	1460.00	-1.448	0.148
Agriculture productivity	77.22	27.06	262.50	-9.165	0.000*
Access to the programme	78.81	23.88	135.00	-8.715	0.000*
Karnataka					
Annual income	76.70	28.10	304.00	-7.740	0.000*
Education	62.59	56.31	1432.500	-1.058	0.290
Occupational status	64.75	52.00	1260.00	-2.318	0.020*
Crop diversification	77.82	25.86	214.500	-8.981	0.000*
Earning members	73.38	34.75	570.00	-7.698	0.000*
Material possession	76.45	28.00	324.00	-8.220	0.000*
Social participation	58.75	64.00	1460.00	-1.448	0.155
Agriculture productivity	78.80	23.90	136.00	-9.373	0.000*
Access to the programme	80.09	21.33	33.00	-9.850	0.000*

Table 2. Comparative analysis of the socio-economic transformation of UP and Karnataka NFSM BF

Variables	Mean rank		Mann-Whitney <i>U</i> value	Z value	Asymp. sigma (two-tailed)
	UP BF (<i>n</i> ₁ = 80)	Karnataka BF (<i>n</i> ₂ = 80)			
Annual income	70.53	90.48	2402.00	-3.083	0.002*
Education	106.33	54.68	3160.00	-0.181	0.857
Occupational status	81.00	80.00	1134.00	-7.858	0.000*
Crop diversification	54.00	107.00	1080.00	-8.370	0.000*
Earning members	80.50	80.50	3200.00	0.000	1.00
Material possession	94.20	66.80	2104.00	-4.402	0.000*
Social participation	80.50	89.50	3380.00	0.000	0.058
Agricultural productivity	77.00	84.00	2920.00	-1.790	0.043
Access to the programme	97.50	63.50	1840.00	-5.618	0.000*

farmers from UP fared better (Table 2). Interestingly, beneficiary farmers of both states were on par with regard to earning members (mean rank of 80.50).

The difference in the socio-economic transformation of UP and Karnataka beneficiary farmers may be due to differences in annual income, implementation strategy and target achievement strategy by the agriculture and allied department personnel. In the case of beneficiary farmers, the findings are in agreement with those of Vijayan *et al.*¹³ and Hiremath *et al.*¹⁴ vis-à-vis agricultural productivity, while for material possession, annual income and social participation, the findings agree with those of Pandey *et al.*¹⁵.

Socio-economic transformation before and after the launch of NFSM

From Table 3, it is obvious that for the Karnataka beneficiary farmers, among the nine socio-economic variables, there

was no significant change in education, while all the other variables registered a significant change before and after the launch of NFSM. For Uttar Pradesh, beneficiary farmers, education and earning members did not register significant changes, while all the other socio-economic variables had significant changes. These findings, except in the case of education, are in agreement with those of Hiremath *et al.*¹⁴, who reported improved agricultural productivity in pulse crops. Regarding social participation, the present findings are contrary to those of Pandey *et al.*¹⁵.

Correlational analysis of socio-economic variables to overall socio-economic transformation

Table 4 reveals Spearman’s rank correlation analysis of socio-economic indicators to total socio-economic transformation for NFSM beneficiary and non-beneficiary farmers of

Table 3. Social-economic transformation before and after the launch of NFSM

Variables	Z value		Asymp. sigma (two-tailed)	
	BF (Karnataka, $n_1 = 80$)	BF (UP, $n_2 = 80$)	BF (Karnataka)	BF (UP)
Annual income	-6.783	-7.044	0.000*	0.000*
Education	-7.730	-4.804	0.053	0.063
Occupational status	-7.438	-7.615	0.000*	0.000*
Crop diversification	-7.817	-6.617	0.000*	0.000*
Earning members	-5.135	-6.500	0.000*	0.052
Material possession	-6.413	-6.221	0.000*	0.000*
Social participation	-7.694	-7.818	0.000*	0.000*
Agricultural productivity	-6.023	-6.172	0.000*	0.000*
Access to the programme	-7.730	-6.900	0.000*	0.000*

Table 4. Correlational analysis of socio-economic variables to overall socio-economic transformation

Socio-economic impact indicators	Coefficient			
	Karnataka		UP	
	BF	NBF	BF	NBF
Annual income	0.552**	0.114	0.414*	0.257
Education	0.384	0.613*	0.585	0.422*
Occupational status	0.741*	0.229	0.747*	0.369
Crop diversification	0.436**	0.302	0.624**	0.542
Earning members	0.625*	0.256	0.777*	0.218
Material possession	0.839*	0.113	0.670*	0.449
Social participation	0.602	0.668	0.573	0.460
Agricultural productivity	0.546**	0.471	0.764**	0.238
Access to the programme	0.705**	0.316	0.647**	0.582

Karnataka and UP. Nine indicators defining overall socio-economic transformation were analysed. Among them, seven indicators, viz. annual income, occupational status, crop diversification, earning members, material possession, agricultural productivity and access to the programme, were positively correlated to overall socio-economic transformation for Karnataka beneficiary farmers, whereas for the non-beneficiary farmers, social participation and education (0.516) were positively correlated. Similarly, seven socio-economic indicators, viz. annual income, occupational status, crop diversification, earning members, material possession, agricultural productivity and access to the programme, were positively correlated in the case of beneficiary farmers from UP; while education (0.482) and social participation (0.788) showed a positive correlation to total socio-economic transformation in the case of non-beneficiary farmers.

The socio-economic transformation was observed in the case of beneficiary farmers of both states. Seven of the indicators being positively correlated to overall socio-economic transformation reveal the tangible outcomes of NFSM. Social participation and education being positively correlated to the socio-economic transformation of the non-beneficiary farmers could be due to the already existing development programmes in the states. Except for social par-

ticipation and education, the present study's findings agree with those of Hiremath *et al.*¹⁴ and Pandey *et al.*¹⁵.

Conclusion

NFSM is pertinent to India, considering its burgeoning population. On the global hunger index chart, India's position at 101 among 116 countries is a matter of concern. Over 33 lakh Indian children are malnourished⁶, which makes it necessary for GoI to follow NFSM on mission mode. In spite of the midday meal scheme, there are a large number of malnourished children, which can be countered only through NFSM. The socio-economic transformation achieved by UP and Karnataka reveals the success of this Mission. Though several issues, fund crunch⁹, insufficient capacity development programmes, tediousness in the beneficiary selection, etc. exist², GoI is trying to implement the Mission in a fool-proof manner. Strategizing the quintessential parts of the programme like NFSM–nutricereals can work wonders for Indian farmers provided proper technical know-how is disseminated. GoI has been fostering millet and pulse cultivation to ensure nutritional security among the population. Millet and pulse seed hubs have been mandatorily initiated at

the district level in several states. So far millet nutri-farms have been established in 100 malnutrition districts of nine states in India for cultivation as well as for ensuring an assured supply chain of nutrient-rich crops. Crop demonstrations, encouragement of commercial cultivation of specified nutri-rich crop varieties through cluster approach of farmers and development of nutri-rich produce to vulnerable sections of the population are undertaken under NFSM. Bio-fortification of cereal crops is also ensured under the Mission. Centres of Excellence for maize and millets have been established by State Agricultural Universities and the Indian Council of Agricultural Research institutions of the high-burden malnutrition districts in several states. Later the same was emulated in less-burden districts too.

The positive results emanating from this study substantiate the pan-India implementation of NFSM. Yet several farmers are skeptical of the nature of the programme on the assurance of payback after resource contribution culminated in decline of the participation rate of farmers. Spurious seeds distributed sometimes through NFSM have worsened the situation. The beneficiary selection criteria also restrict the number of participating farmers; the Mission is concentrated in the agriculturally less-productive regions of India.

1. AFCL, Midterm evaluation of NFSM – A concise report. Agricultural Finance Corporation Limited, New Delhi, 2012.
2. Vijayan, B. and Nain, M. S., Nutritional security through National Food Security Mission for an Atmanirbhar Bharat. *Biotica Res. Today*, 2021, **3**(1), 81–83.
3. AFCL, Report on impact evaluation of National Food Security Mission, Agricultural Finance Corporation Limited, New Delhi, 2014.
4. Grover, D. K. and Singh, J. M., Possibilities and constraints for increasing the production of pulses in Punjab and impact of National Food Security Mission on pulses. Agro-Economics Research Centre, Department of Economics and Sociology, Punjab Agricultural University, Ludhiana, 2012.
5. Increase cultivation area to meet target, officials told. *The Hindu*, 3 February 2018.
6. A close reading of the NFHS-5, the health of India. *The Hindu*, 28 November 2021.
7. Gulati, A., Terway, P. and Hussain, S., Performance of agriculture in Uttar Pradesh. *Revitalizing Indian Agriculture and Boosting Farmers Income*, 2021, pp. 175–210.
8. Mishra, A., Broadway, A. and Jain, J., Overview of food security in Uttar Pradesh, India. *Basic Res. J. Food Sci. Technol.*, 2013, 20–25.
9. Chaitra, G., Gowda, N. S. S. and Shivalingaiah, Y. N., Constraints encountered by beneficiary farmers in adopting National Food Security Mission (NFSM) interventions in selected districts of Karnataka State, India. *Asian J. Agric. Extens., Econ. Sociol.*, 2020, **38**(11), 114–118.
10. Economic Survey 2016–17, Government of India, 2016.
11. Vijayan, B., Nain, M. S., Singh, R., Kumbhare, N. V. and Kademani, S. B., Knowledge test for extension personnel on Rashtriya Krishi Vikas Yojana. *Indian J. Extens. Edu.*, 2023, **59**(1), 131–134.
12. Maheshwari, S. and Bairathi, R., Extent of socioeconomic change of tribals through Rashtriya Krishi Vikas Yojna (RKVY) in Banswara district of Rajasthan, India. *Adv. Econ. Bus.*, 2015, **3**, 190–194.
13. Vijayan, B., Nain, M. S., Singh, R. and Kumbhare, N. V., Socio-economic transformation through RKVY-RAFTAAR in Uttar Pradesh and Karnataka. *Indian J. Extens. Edu.*, 2022, **58**(3), 108–112; <http://doi.org/10.48165/IJEE.2022.58323>.
14. Hiremath, G., Reddy, V. and Nagaraj, N., An assessment on effect of National Food Security Mission (NFSM) on growth and stability of major pulses production in India and Karnataka. *Indian J. Econ. Dev.*, 2017, **13**, 476.
15. Pandey, R., Yadav, R. and Singh, R., Socio-economic status of mustard growing farmers of Haringtongan block of Faizabad district (U.P.). *Ann. Agri. Bio. Res.*, 2020, **20**, 149–252.

Received 27 September 2022; revised accepted 11 January 2023

doi: 10.18520/cs/v124/i8/976-980