



# The Million Farmers School: An innovative Agri-extension Approach

Bishnu Pratap Singh, Sujit Kumar<sup>1</sup>, Pankaj K. Verma<sup>2</sup> and Preetam Saran<sup>2</sup>

State Institute for Management of Agriculture, Rahmankheda, Lucknow (Uttar Pradesh)

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## ABSTRACT

Farming sector is a backbone of Indian economy and the government of India put an important goal of doubling farmers' income till 2022. In line of this ambitious goal the Million Farmers School (TMFS), an innovative programme initiated by the Department of Agriculture, Uttar Pradesh since November 2017. This seeks to address the weaknesses of agriculture extension system and strengthen the same in order to promote resilient farming systems, enhance productivity and production, thereby improving the lives of farmers. This cannot be achieved without providing timely information and knowledge to farmers about scientific methods of farming, newer varieties of improved seeds, appropriate agronomic practices and available market opportunities. With these objectives in mind, a situational analysis was carried out by the department and found that drastic improvement was required in the agriculture extension system in order to achieve the aforesaid objectives. A new model of extension was conceptualized based on structured curriculum, campaign mode and capacity building exercises. Twice every year, the Department of Agriculture deployed its entire extension machinery to conduct more than 15000 training modules for the farmers across the state for providing information and practical knowledge to more than a million farmers in one edition. The curriculum contained information on not only agriculture but also allied sectors like horticulture, animal husbandry & dairy, fisheries, agriculture marketing etc. Five such training editions have been conducted and more than 5 million farmers have been benefited from this innovative model. This was the largest extension exercise in the field agriculture and allied sector. This has also turned out to be a low cost, high return technique which can be easily replicated. It was evident that 88.7 per cent participants were satisfied with the knowledge of trainers, 95.5 per cent participants were satisfied with impact of knowledge circulated in TMFS, 98.7 per cent were fully/ partially picked the technologies, 80.2 per cent participants showed their interest to attend the such trainings in future, almost all were interested to share the knowledge with friends and gaining benefit in order to enhance their knowledge and productivity in various agricultural activities. 73.8 per cent participants answered that they became aware with various government schemes only after attending the TMFS.

**Key Words:** Million Farmers School, Agri-extension, Approach, Training.

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## INTRODUCTION

To ensure food and nutritional security for ever-growing population of the state, it is essential to increase the production and productivity every year. Deteriorating soil health, depleting ground water, disease & pest and climate change are major constraints in achieving this goal. To address these problems, it was felt that the farmers need to be made aware and provided technical inputs regarding

recent scientific advances in the field of agriculture and allied sectors. Agricultural extension being the most critical link (Awotide *et al*, 2015), The Million Farmer School (TMFS) was designed as an intervention to enhance technical knowledge and skill about newer crop varieties, advanced agronomic practices, diversification and integrated farming system to make agriculture profitable. This programme aims to train one million farmers

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Corresponding Author's Email: drbpsingh\_agri@yahoo.in

U.P. Council of Agricultural Research, Lucknow

Directorate of Agriculture, Govt. of U.P., Lucknow

during every edition with available infrastructure and technical manpower taking advantage of the ICT platform. The programme was implemented in a campaign mode, resulting in maximum coverage and output as well as significant capacity building of departmental staff.

Modality of the Million Farmers School comprised of comprehensive 3-5 days' module in which training is imparted on crop varieties, management practices, input use, marketing and value addition. This also includes horticulture, livestock, fisheries etc. More than 15000 training modules were conducted across the state twice every year before the *Kharif* and Rabi crop season, respectively. In these training programmes, farmers irrespective of their land holding area, wealth status, gender, caste or creed simply walked in and got benefit of the programme.

## MATERIALS AND METHODS

The main challenge in implementing the new programme was to develop the effective modality and building capacity of thousands of field workers and to motivate them to function as trainers. Bringing and mobilizing farmers through these schools was another challenge. Proper designing of training curriculum, repeated training through cascade model and motivational talks prepared the department for undertaking such a massive exercise. Attracting farmers to these training sessions were ensured by proper communication strategy and messages through different platform, i.e., print, audio-visual and digital etc. The curriculum included information from other line departments like horticulture, animal husbandry, dairy and fisheries etc. Once it was understood that the agriculture extension system needed to be strengthened, a new model conceptualized and was executed in a campaign mode with a well structured curriculum taking advantage of the large number of technically educated employees having an undergraduate or masters degree in agriculture and allied activities.

Cascade model of training was used for the programme wherein:

Initially zone wise Agri-based problems and component wise bottlenecks were identified in order to plan their proper solution.

Survey and implementation tools were developed to identify the priorities to be addressed.

Firstly, the senior officials of the department of agriculture and allied sector and senior scientists trained the district level officials and scientists of Krishi Vigyan Kendra.

Secondly, master trainers trained the village level functionaries. A trainer handbook including advanced agro-technologies was developed and provided to them

Finally, the village level trainers trained the farmers as per training schedule (Table 2). Every participating farmer was given a technical booklet free of cost.

Video conferencing sessions of the trainings were live-streamed (<http://webcast.gov.in/up/agriculture/>) which was of immense utility for benefits of the trainers and farmers both.

To check the preparedness and knowledge, village level trainer were called on random basis and asked to speak on allotted topic through video conferencing. This exercise was repeated 3-4 times before the start of each edition to prepare them for the ultimate training sessions for the farmers. Sector-wise district level officials were nominated to monitor the programme during the course of implementation. Public representatives have inaugurated / participated in the programme to encourage better peoples' participation. During the training programme, live demonstrations like safe use of pesticides, seed treatment, identification of substandard inputs, germination test for seeds etc. were carried out which enriched the training immensely. "The Million Farmers School" App had also been put in place to monitor the programme. It captures geo-tagged photograph of the activity

## The Million Farmers School

on daily basis along with the details of place and participants.

Most of the existing resources of the state were used under TMFS. To train large number of master trainers across all the districts, National Informatics Centers situated at state headquarter and districts were also effectively utilized. At district level, Agriculture Technology Center infrastructure was utilized to train field level technical staff by district level officials and agriculture scientists. The village level primary schools were used for the training programme, once the classes were over. **Statistical tools applied to interpret the findings**

A total of 16 districts of Uttar Pradesh were sampled for evaluation studies. Each round of TMFS (The Million Farmers School) covered every block of Uttar Pradesh. Training sessions were organized in a few villages in each block. At the time of survey, three rounds of the TMFS had already been organized- the first in Rabi (2017), the second in *Kharif* (2018), and the third in Rabi (2018) as depicted (Table 3). From each treatment village, 20 households were selected randomly from among those that had attended the TMFS and five households were selected from among those that had never attended the TMFS, making a total of 25 households from the treatment village. From each control village, 15 households were selected randomly, all of which had never attended the TMFS.

The average treatment effect on the treated (ATT) (Imbens and Wooldridge, 2009), was defined as:

$$ATT = E[Y1 - Y0|Ti = 1]$$

Whereas, the magnitude of biasness was formally represented as:

$$E[Y1 - Y0| Ti = 1] = ATT + E[Y0|Ti = 1 - Y0|Ti = 0]$$

Summarily, ATT was computed based on the formula given by Imbens and Wooldridge 2009 and Wooldridge (2007).

$$ATT = E[Y1|Ti=1, p(x)] - E[Y0|Ti=0, p(x)]$$

The impact of attending the TMFS on agricultural knowledge of households was estimated using the following specification:

$$Y_i = X_i\beta + MFS_i\alpha + \epsilon_i$$

**Table 1. Number of households attended different chapters of the TMFS.**

TMFS chapter	Season	Participants from the sample
TMFS 1	Rabi, 2017	214
TMFS 2	Kharif, 2018	247
TMFS 3	Rabi, 2018	206

The curriculum was finalized in consultation with Agri-allied departments, agriculture universities, state council of agriculture research and other institutions. Senior officials of agriculture and allied departments and scientists sat together to assess the need and accordingly designed the course curriculum and implementation strategy to make agriculture sustainable and profitable. At district level *Krishi Vigyan Kendra* (KVK) had been actively involved to impart training to village level functionaries. KVK scientists addressed location specific issues and relevant technology in effective manner. The line department at district level also coordinated the programme as their village level workers were deputed as village level trainers and their officials served as master trainer and nodal officers to monitor the implementation of the programme.

## RESULTS AND DISCUSSION

The programme was started in November 2017 in the Rabi Season. Since then five editions have been successfully completed covering more than 76000 villages in which 5.36 million farmers have been trained in line of training edition mentioned in table 2.

Every farmer of the state had been included in the target group under the programme irrespective of land holding size, gender, religion, caste and creed. In all, 5 editions of TFMS were conducted and

**Table 2. Details of the training editions conducted.**

Sr. No	Commencement of Master Trainers' Trainings	Detail of edition	No. of Trainings	No. of Participants		
				Female	Male	Total
1	04 November 2017	First Edition (Rabi 2017-18)				
		Module -I (5 Days	7666	69840	416136	2429879
		Module -II 5 Days	7628	67546	448508	2580271
		Total	15294	137386	864645	1002030
		Percent		13.71	86.29	
2	15 May 2018	Second Edition (Kharif-2018)				
		Module -I 3 Days	7330	64140	413866	478006
		Module -II 3 Days	7441	71365	459818	531183
		Module -III 3 Days	177	2674	13772	16446
		Total	14948	138179	887456	1025635
		Percent		13.47	86.53	
3	16 November 2018	Third Edition (Rabi-2018-19)				
		Module -I 4 Days	7539	89235	450161	539396
		Module -II 4 Days	7560	81301	444440	524741
		Total	15099	170536	894602	1065137
		Percent		16.01	83.99	
4	27 March 2019	Fourth Edition (Kharif-2019)				
		Module -I 4 Days	7753	92055	433206	525261
		Module -II 4 Days	7756	109011	504201	613212
		Total	15509	201066	937407	1138473
		Percent		17.66	82.34	
5	3 Oct 2019	Fifth Edition (Rabi-2019-20)				
		Module -I 4 Days	7701	105821	441255	547076
		Module -II 4 Days	7711	115428	471921	587349
		Total	15412	221249	913176	1134425
		Percent		19.50	80.50	
		Total of all five editions	76262	868414	4497285	5365699
		Percent		16.18	83.82	

more than one million farmers were trained in each edition. The most widely discussed topics during the TMFS training sessions pertained to improved seed varieties, application of fertilizers, plant protection techniques such as the use of pesticides, herbicides

etc., including pest and disease control, information on government schemes related to agriculture, new irrigation methods, and other new agricultural practices and farming methods.

## The Million Farmers School

It was evident (fig 1.) that maximum episode included seeds and planting materials (77.20%) whereas, minimum were related with marketing and nutrient management (3.2% each) as depicted in following figure. Similarly fertilizer application and Plant protection issues were of *at par* significance.

It was observed that more area was covered under timely sowing/transplanting due to this intervention. Practical demonstration about seed treatment and safe methods of pesticide application has helped in cost-effective disease and pest control. Similarly knowledge up gradation in the field of horticulture, animal husbandry & dairy and fisheries has also been observed. The study revealed that major contribution of this programme was an increase in food grains (8.44%), oilseeds (25.81%) and milk production during the year 2018-19 in comparison to 2016-17 (Anonymous 2019). For the first time, the state has crossed 60 MMT food grain production mark (60.40 Mt) and Uttar Pradesh has become the highest producer of wheat (381 Lakh ton), sugarcane, potato and milk in the country.

The programme has been very popular among women farmers as its curriculum also covered women friendly implements and agricultural activities like seed storage, seed treatment, dairy and poultry programme (Rejesus, 2010). Female members were involved in majority of agriculture and allied sectors activities and their participation to this sector was very substantial. Participation of women farmers in first edition was only 13.7 per cent which increased to 19.5 percent in the year of 2018-19 during fifth edition which indicated its growing popularity among rural women. Further the initiative has been highly sustainable because of its low cost and high return intervention (even less than 01 US dollar per person). It could be said that this is highly replicable on large scale so, there is no question of any unseen financial or syntax problems. It has a positive impact on the environment as well as it is in resilience with climate smart agriculture by ensuring conservation agriculture. Socially, this is a very inclusive programme which does not

discriminate on the basis of wealth, education or other differentiating factors (Heckman *et al*, 1999).

Looking at the success and effectiveness of The Million Farmers' School, state government decided to get this programme evaluated through an institution of international repute, i.e., International Food Policy Research Institute (IFPRI). The evaluating agency took the household as unit of the study. In this study a range of tools like propensity score matching (PSM), inverse probability weighted adjusted regression (IPWRA), coarsened exact matching etc. were used to address the issues like representative sample selection, impact estimation of TMFS on agricultural knowledge of household assessment of decision making of farmer to attend TTMFS. The indicators taken up by the evaluating agency included; assessment of knowledge level of trainers, usefulness of knowledge imparted in TMFS; knowledge up gradation of participants willingness to attend further such trainings. Out of total 1336 sample households 667 persons were surveyed to collect the feedback. Data on various indicators are presented in table 3.

From the data it was evident that 88.7 per cent participants were satisfied with the knowledge of trainers, 95.5 per cent with impact of knowledge circulated in TMFS, 98.7 per cent were fully/partially picked the technologies, 80.2 per cent participants showed their interest to attend the such trainings in future, almost all were interested to share the knowledge with friends and gaining benefit in order to enhance their knowledge and productivity in various agricultural activities. 73.8 per cent participants became aware with various government schemes only after attending the TMFS.

The IFPRI found significant and positive impact of TFMS on the farmers. Evaluated documents suggested that 90 per cent of the participants were satisfied with the training received on improved seed varieties, application of fertilizer, plant protection technique, new irrigation methods

**Table 3. Indicator based feedback of farmers.**

Sr. No.	Particular	TMFS-1 ( <i>Rabi-2017</i> )		TMFS-1 ( <i>Kharif-2018</i> )		TMFS-1 ( <i>Rabi-2018</i> )		Total	
		No. of house holds	Percent	No. of house holds	Percent	No. of house holds	Percent	No. of house holds	Percent
1	Status of Trainers knowledge on participant.								
A.	Strongly agree	42	19.63	50	20.24	39.00	18.93	131.00	19.6
B.	Agree	148	69.16	167	67.61	146	70.87	461.00	69.1
C.	Neither agree nor disagree	21	9.81	28	11.34	19	9.22	68.00	10.2
D.	Disagree	2	0.93	2	0.81	2	0.97	6.00	0.9
E.	Strongly disagree	1	0.47	0	0.00	0	0.00	1.00	0.1
2	Impact of knowledge, information, advice etc. on participant.								
A.	Very Useful	86	40.19	103	41.70	82.00	39.81	271.00	40.6
B.	Somewhat useful	120	56.07	131	53.04	115	55.83	366.00	54.9
C.	Not useful at all	8	3.74	13	5.26	9	4.37	30.00	4.5
3	Participant was able to understand what was being taught in the training								
A.	Fully	120	56.07	143	57.89	113	54.85	376.00	56.4
B.	Partially	90	42.06	102	41.30	90	43.69	282.00	42.3
C.	Nothing	4	1.87	2	0.81	3	1.46	9.00	1.3
4	Knowledge participant before treatment								
A.	Strongly agree	26	12.15	32	12.96	24	11.65	82.00	12.3
B.	Agree	129	60.28	150	60.73	116	56.31	395.00	59.2
C.	Neither agree nor disagree	42	19.63	45	18.22	46	22.33	133.00	19.9
D.	Disagree	15	7.01	18	7.29	16	7.77	49.00	7.3
E.	Strongly disagree	2	0.93	2	0.81	4	1.94	8.00	1.2
5	Interest of participant to attend more training in future.								
A.	Yes	153	71.50	180	72.87	148	71.84	481.00	72.1
B.	No	17	7.94	19	7.69	18	8.74	54.00	8.1
C.	Maybe	44	20.56	48	19.43	40	19.42	132.00	19.8
6	Participant interest to friends/relatives/neighbors to attend the TMFS								
A.	Yes	180	84.11	204	82.59	168	81.55	552.00	82.8
B.	No	34	15.89	43	17.41	38	18.45	115.00	17.2
7	Main benefits from attending the TMFS as reported by participants								
A.	Understand govt. schemes	160	74.77	182	73.68	150	72.82	492.00	73.8

### The Million Farmers School

Sr. No.	Particular	TMFS-1 (Rabi-2017)		TMFS-1 (Kharif-2018)		TMFS-1 (Rabi-2018)		Total	
		No. of house holds	Percent	No. of house holds	Percent	No. of house holds	Percent	No. of house holds	Percent
B.	Meet local officials	70	32.71	80	32.39	69	33.50	219.00	32.8
C.	Help adopt new technology	41	19.16	47	19.03	41	19.90	129.00	19.3
D.	Meet progressive farmers	26	12.15	32	12.96	25	12.14	83.00	12.4
8	What elements/aspects of the TMFS did participants find most useful								
A.	Interaction with local extension officials	115	53.74	136	55.06	110	53.40	361.00	54.1
B.	Discussion of government schemes	88	41.12	102	41.30	87	42.23	277.00	41.5
C.	Interactions with other farmers	86	40.19	99	40.08	84	40.78	269.00	40.3
D.	Demonstrations	56	26.17	65	26.32	54	26.21	175.00	26.2
E.	Discussion of agricultural practices/technology	58	27.10	63	25.51	51	24.76	172.00	25.8

and other new agriculture practices and farming methods (O'Donoghue and Hennessy, 2015). Mobilization of the resources for the initiative was found to be adequate. Implementation quality of the programme was found satisfactory. However, enhancement in participation in future editions was suggested. Initially some village level trainers felt some difficulty in communicating but rigorous capacity building and training improved their communication skill and knowledge. The benefits of the programme have been found to be across different regions and social groups. Based on the feedback received from the impact evaluation, training curriculum was revised to make it more relevant and interesting for the farmers. A Mobile App to ensure better monitoring of the farmer schools was also launched during the fifth edition.

While the lowest tier of the technical functionaries participated as trainers for the farmers and benefits from each other's experiences in doing so, the higher tiers function as master trainers and key resource persons, respectively. The higher tiers closely monitored the implementation effectively and provide feedback for further improvement in the programme.

### CONCLUSION

TMFS was very effective, low cost and high return agriculture extension model which can be easily transferred / adapted to other regions of the country. It was a meticulously structured training programme in which different aspects of agriculture and allied sectors discussed in detail

before commencement of crop season. IFPRI, in its evaluation, has found this model to be highly replicable and usable by other states and countries. The Million Farmers School supported Sustainable development Goal 2: End hunger, achieve food security and improved nutrition and promote sustainable agriculture. The Million Farmers School aims at imparting knowledge of efficient, climate resilient and sustainable agriculture, boosting the production and productivity. The food grain production during year ending March 2017 was 55.8 MMT, which rose to 60.4 MMT in year ending March 2019. Similarly, 12.5% increase in oilseeds production was achieved during corresponding period insisting that extension of latest technology / scientific advances is essential to ensure significant increase in production and productivity.

Dissemination of latest technologies, information about improved seeds and package of practices through TMFS has resulted in quantum jump of food production of the state. State has also achieved ever highest production of Milk and Vegetable leading to food and nutritional security. It was an innovative Programme which organized farmer schools for disseminating new knowledge to farmers in a campaign mode with a structured curriculum on a very large scale. This programme apart from training the farmers, built capacity of the extension employees of the department in a big way.

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