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Farmers Field School: An Innovative Approach in Technology Transfer and Skill Development of Livestock Owners

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Abstract

The use of FFS extension approach will make the farmer to be the sense of belonging and ownershipetral to agricultural research and dissemination of livestock production technologies. This approach not only assist in problem solving, but also help in making research more relevant to the needs of the farmers and other users. To summarize, the FFS model is an important institutional and organizational innovation that needs to be studied in depth in different agro-ecological zones, different institutional arrangements and over time. Farmer Field School as a model is the most appropriate methodology for validation and dissemination of agricultural technologies which can lead to people-oriented and sustainable agriculture in developing nations. Farmers' field school (FFS) is a season long training programme to impart training to the farmers generally for three months or till the results achieved. FFSs on livestock farming in Bhilwara district under ATMA was conducted with the objective of diffuse field-oriented technologies that result successful and profitable farming. 03 Farmer Field Schools on dairy farming, sheep & goat farming, poultry farming, fodder cultivation, value addition in milk and Azolla production techniques were selected, one schools on need basis in each block was conducted and totally 03 programmes in three blocks were conducted in one year (2013 – 14). In each block, the Selection of 20 interested farmers and totally 20 farmers / block were selected based on the livestock species owned and the scope for processing and marketing. So, in total for three blocks 60 farmers and farm women were selected to conduct 03 Farmers Field School. Pre evaluation of trainees was conducted by preliminary survey, dung, urine and water samples analysis. To overcome the major constraints viz., disease outbreak, disorders in livestock and poultry, low milk yield/body weight, high cost of feed and fodder, delayed calving interval and kid mortality ranked by the farmers, suitable package of practices were imparted to the trainees at their field and the results are indicated that the overall adoption behaviour of the farmers showed that majority of them were partial adopters (65.38%) followed by high adopters (21.28%) and low adopters (13.34%). It is proved that it improves the sense of ownership of technological packages and new knowledge and skills. The FFS approach is a direct response to the needs of the farmers.

Keywords: Adoption, Bhilwara, FFS, Livestock Farming

Introduction

Farmer Field Schools serve as a platform for mutual learning among farmers and resource persons. Interactions, discussions and hands on training provides an opportunity to revive and sustain traditional knowledge while making improvements through modern science. The farmer field school is a season long training of farmers involving participatory activities, hands-on analysis and decision making. The field school trainer plays the role of a facilitator rather than an instructor. The objective of the field schools is to give farmers an opportunity to learn and achieve greater control over the conditions they face daily in their fields. Farmers who participate in field schools learn how to reduce their cost of dairy and poultry inputs, improve management, enhance their productivity and increase incomes. From this initial base, farmers can move into other crops and diversify into other activities related to their agro ecosystems. The ultimate aim of the field school is to improve farmers' knowledge and decision making abilities so they can build up sustainable agricultural systems and enhance food security in their families and communities. A typical example of participatory extension method is the farmer field school (FFS) approach, now practiced in at least 78 countries (Braun *et al.*, 2006).

It is a participatory approach to disseminate and fine tune the production technology in such a way that adoption rate becomes high. The field school offers farmers an opportunity to learn by doing, by being involved in experimentation, discussion and decision-making. This strengthens the role of farmers in the research extension-farmer chain. The form and structure of FFS therefore grew from the practical need for field observation making practice, use of a facilitative leader, or formation of a local group to self-organize the study field and participants. The Farmer Field School (FFS) is a group-based learning process that has been used by a number of governments, NGOs and international agencies to promote Integrated Pest Management (IPM). Farmer Field Schools approach was based on the fact that farmers learn optimally from field observation and experimentation. Implementing a successful field school requires that those involved in its establishment and management have the right mind set (attitude change) to deal with the challenges and demands of the approach. The overall objectives of FFS are to bring farmers together to carry out collective and collaborative inquiry with the purpose of initiating community action and solving community problems (Oduori, 2002). The steps described below act as a guide and a monitoring plan for field school implementation. While it follows through the eight modified steps, practitioners have identified some common themes that would enable comprehensive understanding and implementation of a field school. Hence it was planned to conduct 03 farm schools under ATMA in two blocks of Bhilwara district to cover maximum number of farmers. Hence, conduct of FFS on dairy, sheep and goat, poultry and Azolla cultivation in Bhilwara district was planned with the following objectives:

a. Operationalizing front line demonstrations in animal husbandry activities to learn the new technologies by "learning by doing".
b. Providing training to target farmers by having interactive sessions and group activities.
c. Conducting exposure visits to the learning farmers to learn the new technologies by "Seeing is Believing".
d. Upgrading knowledge of the surrounding farmers through field days and training programmes.

Materials and Methods

Farmer's Field Schools (FFSs) established at the village level provided a platform for knowledge building and sharing on agroecology where farmers of 4-7 neighbouring villages meet, interact and find solutions locally. They learn through hands-on training on various topics like livestock farming and like dairy, sheep & goat, poultry, azolla production technique and value addition of milk were planned. Bhilwara district was selected to conduct the Farmer Field School and the district is located in the South Eastern part of state of Rajasthan between 25.1 & 25.58º N Latitude and 74.1 & 75.28º East Longitude at about 380 m above mean sea level. The district comprise of Twelve blocks out of which three blocks were selected for the programme. Three Farmer Field schools on livestock farming and like dairy, sheep & goat, poultry, azolla production technique and value addition of milk were planned and totally 03 programmes for three blocks were conducted in one year (2013– 2014) @ three schools / block on need basis. In each block, potential villages and progressive farmers were identified by collection of village details with the local panchayat leaders. The Selection of 20 interested farmers per armers field school and totally 60 farmers of three blocks were selected based on the livestock species owned and the scope for processing and marketing. The planning meeting was conducted with the identified farmers regarding the conduct of farmers field school.

Conduct of FFS

The major constraints faced by the trainees in livestock farming were collected from the respondents and ranked for each block. Based on the constraints prioritized one Farmer Field Schools on livestock farming and processing were planned to conduct in each block. The FFS was conducted weekly in the farm and teaching was associated with front line demonstration. Each group was sub divided into five groups with five members in each sub group. Pre evaluation test was conducted for each group on the selected FFS topic. The trainee's knowledge level was assessed. In each class group activity was assigned to them to learn the package of practices by themselves. The livestock of one farm were selected and the FLDs on the technologies where the operation skill is needed were conducted. The classes were completed once the group accepts the results obtained from the demonstrations generally 3-4 months. In between exposure visits were arranged to take the farmers to field visits. Evaluation for each FFS was conducted after six months with 60 trainees (25% of total trainees) selected randomly. The adoption level was measured on the management practices on feeding, breeding, fodder cultivation and health. The score was assigned for the adoption of each practice as complete adoption – 2, partial adoption – 1 and non-adoption – 0. The total score for a respondent is obtained by summing up the score obtained on each practices. The adoption level of the respondents was measured by making use of adoption index (Karthikeyan, 1994 in Rahman, 2007). Depending upon the extent of adoption of improved technologies the respondents were categorised as low adopters - 0-33%, partial adopters - 34–66% and high adopters - 67–100%.

$$Adoption\ Index = \frac{Respondents\ total\ score}{Total\ possible\ score} \times 100$$

Results and Discussion

The participation was voluntary and the average age of the trainees attended the school was 38.0±6.86. Out of total trainees, 30 per cent of farmwomen were attended FFS since the programme has conducted in their own village. Impact of evaluation of trainees was conducted after six months of the programme and the results are as follows.

Adoption Level in Feeding

Formulation of feed ration and feeding concentrate, green fodder, dry fodder and mineral mixture was assessed. The quantity of feed and fodder given and the cost per kg of feed was also calculated. The details are presented below. Feeding concentrate ration was improved from 13.33 per cent to 86.67 per cent. Feeding mineral mixture was adopted only by 30.0 per cent of farmers. But before the conduct of school it was 70.0 per cent of farmers not adopt due to non-availability and high cost.

Table 1: Adoption level in feeding of livestock

Parameter	Yes	No	Quantity
Feeding concentrate (kg)	52(86.67%)	8 (13.33%)	3.50±1.08
Green fodder (kg)	44(73.33%)	16(26.67%)	15.0±6.80
Dry fodder (kg)	60(100%)	0 (0.00%)	8.50±3.30
Mineral mixture (gm)	18 (30.0%)	42 (70.0%)	32±16
Water (lit)	60(100%)	0	65.00±8.60
Concentrate feed rate (Rs)	-	-	18.50±1.82

Adoption Level in Fodder Cultivation

Area of green fodder production increased from 18 acres to 62 acres after the conduct of FFS. Out of 73.33 per cent farmers cultivated green fodder the different types of fodder cultivated was assessed. Most of the farmers cultivated multicut sorghum since it is drought tolerant. Area of cultivation of single cut sorghum for dry fodder was 1.5±1.20 acres since all farmers need dry fodder for livestock. Area of cultivation of protein rich fodder lucern is liking majority farmers in the area.

Table 2: Fodder cultivation status of FFS trainees

Fodder Type Area (acre)	Fodder Type Area (acre)
Green Fodder - Multicut Sorghum	0.5±0.18
Sorghum	1.5±1.20
Lucern	0.5±0.12
Napier grass	0.05±0.3

Adoption Level in Breeding and Health

It was noticed from the results that estrus cycle was regular in 85 per cent of the animals and the calving interval is 13-14 months. Also, farmers are aware to deworm and vaccinate their animals and poultry to protect from diseases. Disease outbreak in desi chicken reduced from 55 percent to 10 percent. The clean milk production practices protect dairy animals from mastitis with 86.67 per cent farmers. The parasite free from 76.67 percent animals.

Table 3: Adoption level in breeding and health

Parameters	Result
Estrus cycle (%)	Regular 51 (85%)
	Irregular 09 (15%)
Breeding Method (%)	AI 40 (66.67%)
	Natural 20 (33.33%)
Place of AI (%)	Door step 30(50.0%)
	Dispensary 02 (3.33%)
	Milk Society 8 (13.33%)
Cost of AI (Rs)	Rs.25/- to 125/-
Calving Interval (Months)	13.67±1.80
Deworming Interval (Months)	4±2 months
	Regular – 46 (76.67%)
Vaccination Interval (Months)	6±4 months
	Regular – 38 (63.33%)
Occurrence of mastitis	Yes 8 (13.67%); No 52(86.67%)

Overall Adoption Behavior of FFS Trainees

The data about the overall respondents' adoption behaviour in different practices indicated that the farmers were high adopters in health (76.67%) with the mean score of 46.0 and breeding (85%) with the mean score of 51.0. More than half of the farmers were high adopters in green fodder production (73.33%). But the mean score was 44.0. The farmers were partially adopting the technologies in formulating feed ration and feeding concentrate feed (86.67%) with the mean score of 52.0 and farmers are low adopters in feeding mineral mixture (30%) with the mean score of 18.0. The overall adoption behaviour of the farmers showed that majority of them were partial adopters (65.38%) followed by high adopters (21.28%) and low adopters (13.34%). The finding was in line with Mallikarjuna *et al.* (2012) and the gain in yield results are also in accordance with the results obtained by Lal et al., (2013) and Singh *et al.* (2011) in seed spice crops.

Production Status of Animals

The production status of animals indicated that the performance of the animals improved better by feeding concentrate feed and green fodder. The production status of dairy cattle increased to 2250 ±216 lt in 282±18.50 lactation days and for buffaloes, it was 1210±128 in 255±38.40 days. The average body weight of lambs was 13.50±1.32kg at three months of age and 20.50±1.30 kg in kids at 6 months of age. Overall, the feedback of trainees revealed that 90 per cent of trainees experienced new skills in livestock farming.

Table 4: Production status of animals

Parameters	Result
Lactation length (days)	Cattle 282±18.50
	Buffalo: 255±38.40
Lactation yield of Cattle (Lt)	2250 ±216
Lactation yield of Buffalo (Lt)	1210±128
Fat%	Cattle 4.16±0.33
	Buffalo 7.52±1.92
SNF%	Cattle 8.20 ±0.37
	Buffalo 8.60±0.45
Body weight of kids and lambs	Lambs – 3 months: 13.50 ±1.32kg
	Kids – 6 months: 20.50 ±1.30 kgs

Conclusion

The average results of the FFS demonstration plots with improved and scientific technologies was higher than the yield under farmers' practice. Thus FFS programme was very effective tool in changing attitude, skill and knowledge by using improved technology and recommended package of practices of livestock as FFS is based on the premise that the farmers participating farmers become researchers who test various technological options available, during which process they are able to decide what the best alternative for adoption is in their particular circumstance, capacity building for improved smallholder livestock management and income generation. Conduct of FFS in one year improved the adoption behaviour of scientific practices among the livestock farmers of Bhilwara district. Organising FFS at field level resulted in establishment of strong linkage between scientist – extension worker –lead farmer-fellow farmers. The FFS groups provide potentially powerful platform which more holistic community development interventions and promote business development services on a more commercial basis for sustained small livestock micro-enterprise development. It may be concluded that Involvement of farmers in the farmer field school is vital which helps the scientists acquire knowledge about traditional practices and redesign their strategies. The outcome of such a process is not only relevant to farmers but is also sustainable in the long run.

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Conflict of Interests

There is no conflict of interest.

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