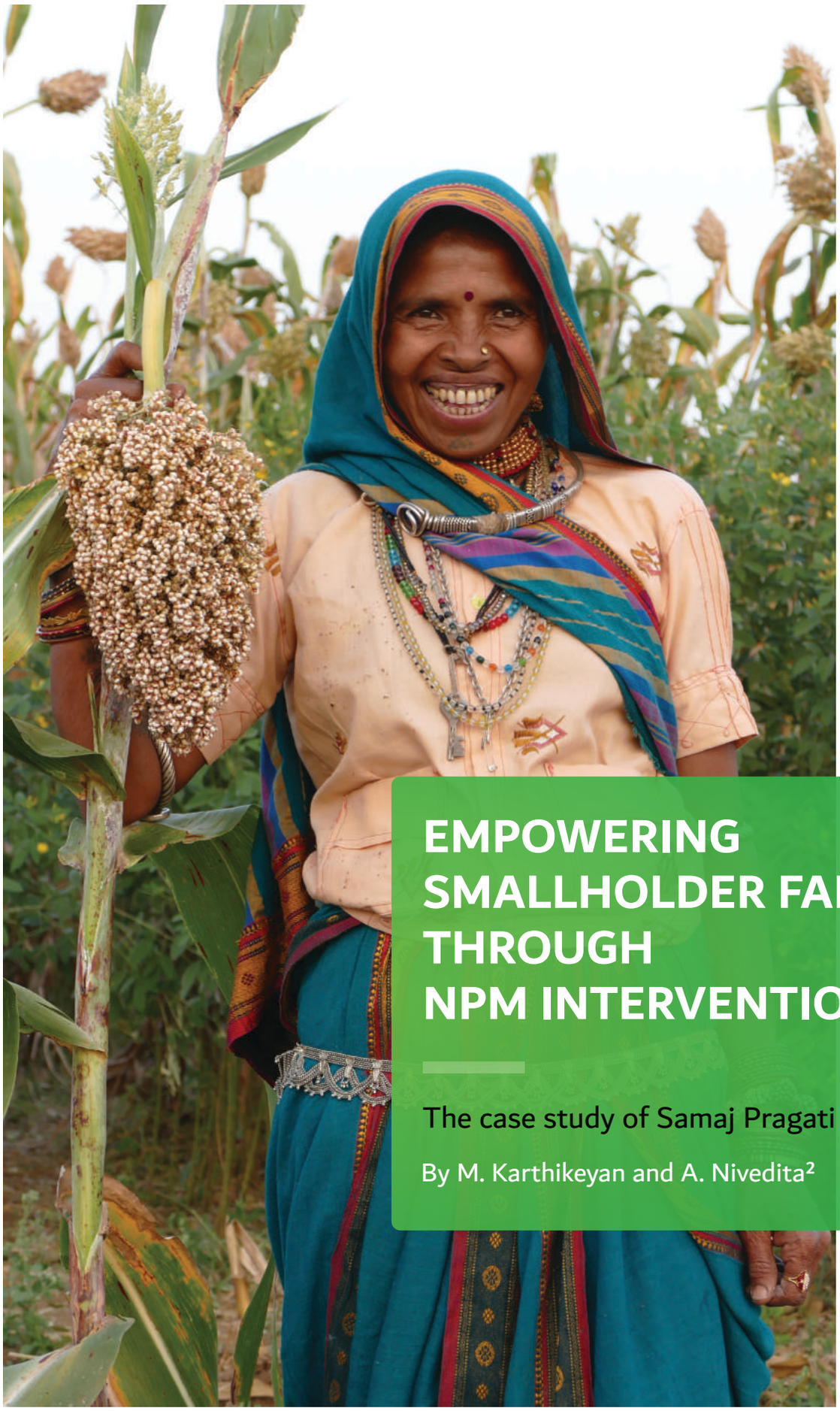

EMPOWERING SMALLHOLDER FARMERS THROUGH NPM INTERVENTIONS

The case study of Samaj Pragati Sahayog (SPS)[1]

By M. Karthikeyan and A. Nivedita[2]

[1] SPECIALLY WRITTEN FOR NPM NETWORK

[2] Both the authors are associated with NPM Network.They acknowledge the support provided by SPS team members for the study.

About NPM Network

The **NPM (Non-Pesticidal Management) Network**, is an informal network initiated by a group of CSOs to promote 'pesticide-free' sustainable agriculture at the grassroots and to establish pesticide-free foods as a 'category' in the local, regional, and national markets. Its main objectives are, (i) Facilitate exchange of learning among the members, (ii) Develop and promote NPM standards and protocols for labelling and certification, (iii) Build the capacities of farmers' organisations, CSOs and other value chain actors, and (iv) Build the knowledge base, serve as a resource organisation, and create an enabling environment for NPM.

This case study is produced as a part of **'Improving Market Readiness of Smallholder Farmers Practising Non-Pesticide Management of Agriculture Project'** implemented by the NPM Network and SEEDS with the funding support from Bharat Rural Livelihoods Foundation (BRLF).

About Project

Improving market readiness of smallholder farmers practicing Non-Pesticide Management (NPM) of agriculture

Realizing the importance of Non-Pesticidal Management (NPM) for the holistic development of poor communities, BRLF, a funding agency with a focus on the backward regions of Central and Eastern India, have adopted the strategy of promoting NPM as one of the mandatory component in their support for all the projects supported by them.

Initial support was given to their NGO partners for adoption of NPM production practices. As a result of this strategy, the NGO partners have promoted adoption of NPM methods with a sizable number of small farmers in their working locations. As a next step to incentivize the NPM farmers in terms of assured markets and prices for NPM produce by building NPM value chains, support was given for improving the market readiness of the NPM farmers through this project.

This project, implemented by the NPM Network and Social Education Economical Development Society (SEEDS), has the following specific objectives:

1. To strengthen the capacities of inexperienced partners, who are advocating NPM, to promote community based, producer-led Farmer Producer Organizations (FPOs).

2. To enhance the market preparedness of partners who are already promoting FPCs and open up for them, the possibility of working at scale to connect farming communities with organized markets.

THE NPM NETWORK

SEEDS

BRLF

I. BACKGROUND

SPS is a development organisation registered under the Societies Registration Act, 1860 by 1990. The central mandate of SPS is the empowerment of India's most disadvantaged people – women, Adivasis, Dalits and the poor, which SPS believe contributes to strengthening fragile democracy at the grass-roots in India. SPS believes that location-specific watershed development combined with low-cost, low risk agriculture, other nature-based livelihoods and women-led institutions can result in sustained higher incomes and empowered communities. This approach can arrest distress migration towards the metros and can liberate the rural poor from the clutches of usurious moneylender-traders. With this overarching development perspective, SPS has been engaged in development initiatives on Water management, Sustainable agriculture, Crop produce aggregation, Self-Help Programme, Livestock development, and Health and Nutrition.

SPS directly works in about 574 villages and towns in eight blocks of three districts (Dewas, Khargone and Amravati) in the States of Madhya Pradesh and Maharashtra. These are some of the most backward, remote, drought-prone regions of India with a high tribal population and they typify some of the most difficult problems faced by the people in this country. Lack of water infrastructure, dependence on rainfed agriculture leading to migration and displacement due to infrastructure projects are some of the problems faced by these communities. The topology of the area is undulating and black soil makes up about 40 per cent of the soil while muram and mixed soil make up the other part of the area. This region is also known for the highest under-five mortality rate, especially malnutrition-related deaths.

SPS initially focused on water conservation and harvesting interventions. Later it understood that any such effort is ineffective if it does not include attempts to regulate the end-uses to which water is put. Hence, SPS started focusing on interventions for optimisation of water use in agriculture as an integral part of a watershed management programme. SPS has tried to work out a package of agricultural practices finely tuned to the resource endowments of the watershed, which is accessible to the poor (low cost) and sustainable (low-risk). As part of this, SPS Agriculture Programme has been promoting Non-Pesticidal Management (NPM) agriculture. The idea of the NPM intervention is to encourage farmers to grow crops without any chemical pesticides, create an identity for their produce and link these small producers to markets. NPM agriculture emphasizes building up soil fertility through appropriate management practices (such as composting and recycling of agricultural residues, use of farmyard manure, cattle urine, green manuring crops, and application of tank silt) with a gradual phasing out of chemical fertilizers.

NPM intervention was started in Udainagar and Punjapura locations in Dewas District, by 2007-08, which was later extended to five other locations

Table 1: Details on participation of farmers in SPS Agriculture Programme- 2019-20

S. No.	Location	Villages	Farmer Groups	NPM Farmers	Total landholding of NPM Farmers (In hectares)	Total land under NPM (In hectares)	NPM land as a share of total landholding (%)
1	Bagli	18	54	927	2596.69	884.40	34.06
2	Bhikangaon	12	40	490	767.75	293.15	38.18
3	Kantaphod	16	58	947	1248.00	1220.50	97.80
4	Punjapura	28	122	1942	1957.57	1867.40	95.39
5	Udainagar	19	88	1244	1891.08	1162.70	61.48
6	Barwah	11	39	960	506.40	168.80	33.33
7	Melghat	13	49	843	806.60	90.30	11.19
	Total	**117**	**450**	**7353**	**9774.09**	**5687.25**	**53.06**

namely Kantaphod and Bagli (2016) in Dewas district, Barwaha and Bhikangaon (2019) in Khargone district, and Melghat (Dharni; 2018) in Amravati district of Maharashtra. As of March 2020, SPS was working with 7353 farmers from 117 villages organised into 450 Farmers Groups, who have adopted NPM approach in 5687.25 ha as shown in Table 1.

Over the years, NPM initiative of SPS has matured from a 'production focused intervention' into a 'holistic food system focused intervention'. This case study is prepared to share the rich experience and learning of SPS in its 12 years journey on contextualizing the NPM interventions to the Central Indian belt and undertaking it on a significant scale, for the benefit of other organisations and actors interested in undertaking NPM related interventions. The following sections share the salient practices, benefits realized and key learning related to different components of NPM intervention of SPS.

II. SALINET PRACTICES RELATED TO NPM INTERVENTION OF SPS

1. Mobilization of farmers for NPM initiative

Salient practices of SPS related to mobilization of farmers for NPM intervention include,

1.1 Effectively capitalizing on existing programs to mobilise members for the NPM intervention

Fig.1 Farmer Group meeting at Bikhangaon location

SPS capitalized its wider presence, goodwill and social capital built over the years through engagements on watershed development interventions, micro-finance and livelihood interventions housed with women SHGs, and other development programs for building a base for NPM agriculture as another layer of development intervention. Awareness raising regarding harmful effects of pesticides and motivating the farmers to explore NPM approach was carried out using the women SHG platform, seasonal farmers' meetings organised for interventions in Water Management Programme and other agricultural interventions.

1.2 Cluster approach to NPM promotion

While in the beginning farmers who came forward to adopt NPM from any part of the location were enrolled in the NPM intervention. This has resulted in working with farmers located sparsely across the working villages. Later, on understanding that feasibility and cost-effectiveness of undertaking NPM intervention increases if it is implemented in a compact parcel of land, villages where 40 to 60% of the farming families were engaged in the ongoing SHG and Agriculture Programmes of SPS were given preference for enrollment of farmers under NPM intervention. Office bearers and staff of local federations decide which villages to be focused for the NPM intervention in their location.

1.3 Extensive use of short videos produced by local community

Short videos produced by local Community Resource Persons (CRPs) trained by SPS were extensively used for educating the farmers and motivating them to adopt NPM approach. Over 200 such community videos have been produced so far on themes related to agriculture and many of them exclusively cover different NPM interventions. These videos shared the practices and experiences of NPM farmers in the working area, with whom local people can easily identify with. They were hugely popular among farmers and found to be effective tools of taking the messages of the NPM intervention to a larger number of farmers. These videos can be accessed at https://www.youtube.com/user/samajpragatisahayog/videos.

1.4 Saturation strategy for expansion of NPM intervention

While expanding the NPM intervention, the strategy of bringing in additional members in the already

working villages was given priority over adding members from a new village. This saturation strategy benefited from the positive influence of existing NPM farmers over the neighboring farmers. It helped in increasing the share of land under NPM in the total land cultivated in the village. This in turn improved the ease of aggregation of NPM produce and cost effectiveness of managing the NPM intervention.

2. NPM production practices adopted for different crops

The NPM intervention of SPS initially focused on 'cotton' as a focus crop and later on 'soyabean'. Understanding the complexities in effectively intervening in these crops due to higher price fluctuations, production uncertainties due to weather related issues, difficulties in managing pests and diseases and limited scope for value chain interventions at the micro level, later the focus crops were changed. Currently the focus crops for the NPM intervention are sorghum, maize, wheat, bengalgram, blackgram, greengram, groundnut and sesame, given their role in food and nutrition security and scope for organizing aggregation, value addition and collective marketing. Focus crops vary across the working locations based on the share of area cultivated under each one of them. In order to keep NPM agriculture sustainable, SPS focused on providing efficient extension services to farmers. Some of the focus areas are soil fertility enhancement, integrated pest management practices, land use planning, varietal trials, demand management of water, and promotion of millets, pulses, dryland horticulture and vegetables. Some of the salient practices related to NPM production are,

Fig.3 Testing of seeds for germination by Suntia Bai Dinesh

Fig.2 Sugan Bai from Seetapuri village making *Sanjeevak*

Fig.4 Sunita Bai Lakhan fixing T-guard in her bengalgram field

2.1 Mandatory NPM practices promoted

Given the wide number of crops covered under NPM and the variation in focus crops across the locations, the following interventions are promoted as the mandatory NPM practices for all the farmers: i) Seed germination test, ii) Seed treatment, iii) Application of Organic manures, iv) Use of Bio-repellants, v) Farm bunding and vi) Boundary plantation.

Fig.5 Farm bunding in Bagli location

Table 2: Details on Adoption of Soil Health Management Practices in 2019-20

S. No.	Soil Health Management Practices	No. of farmers adopted
1	Soil Testing (preparation of Soil Health Card)	138
2	Summer Deep Ploughing	1571
3	Using Farmyard Manure	3150
4	Bhu-NADEP	156
5	Pakka-NADEP	53
6	Four Pit Vermicompost	10
7	Liquid Manure (*Sanjeevak*)	980
8	Tank Silt Application	42
9	*Amrutpani*	202
10	Weed Compost	387
11	Cattle Shed cum Urine Tank	70

2.2 Soil health improvement interventions

SPS believes that soil health improvement is one of the major planks of sustainable agriculture. Wide variety of interventions were promoted towards this end as can be seen in the Table 2 on soil health management practices adopted by farmers in different villages during 2019-20.

2.3 Collective production and marketing of bio-repellants

To smoothen the uptake of NPM agriculture, the Agriculture Programme has helped setting up 23 bio-repellent units across six locations. These units are run mostly by landless labourers. They serve the purpose of providing an alternate source of income to the producer and simultaneously make the NPM process less time and labour intensive for the farmers.

Fig.6 SHG member Bhagvathi Bai Sultan Singh making bio-pest repellent in her unit

The producers are provided special training for making the bio-repellents and instructions about its proper use and applicability according to the nature of pests. The bio-repellents are then marketed in SHG and Farmer Group meetings. A major selling point for these bio-repellents is that they are low-priced and are easily accessible as they can be purchased by farmers not far from their homes. During 2019-20, 6796 litres of bio-repellents like *Paanch pati khada* (extract of 5 herbal leaves), *Char chutney* (extract of onion, garlic, ginger & green chilli) and *Nimboli khada* (neem oil and cow urine mix) worth of Rs. 2,03,880/- were prepared by these units and sold to interested farmers.

2.4 Systematic capacity building efforts at different levels

Master trainers are developed at the Agriculture Programme level in SPS by engaging external resource persons. These master trainers in turn train the agriculture professionals, Mitaans or Community Resource Persons (CRPs) and progressive farmers hailing from each location. They in turn train the NPM farmers enrolled in each village. This systematic effort for capacity building helped in broad basing the capacity building efforts for NPM intervention and in ensuring mandatory training to all the enrolled farmers.

2.5 Quality assurance systems at the production level

The following process steps are followed by SPS NPM intervention to assure quality of NPM produce at the farmer level:

1. Farmers coming forward to adopt NPM are ensured to undergo training on NPM farming practices.

2. These farmers were organised into NPM Farmers Group. These groups meet three times in a crop season- pre-season, mid-season and before harvest. They aid in data collection and internal monitoring of NPM adoption and offer peer support.

3. NPM farmers take a collective pledge at their group level to adopt NPM protocols, including not using chemical pesticides at any stage of crop production and not using GM varieties.

4. They share basic details about them and about their farming practices.

5. They share their plan for adoption of NPM approach in each season.

6. The list of farmers who agrees to follow NPM protocol along with their details on crops, land areas and expected yield is made for each season.

7. Mitaans support these farmers in addressing any issue that arise in adoption NPM agriculture during the crop season.

8. Internal monitoring by the team is done to ensure that no chemical pesticides are used by the enrolled farmers.

9. Before the harvesting period, Internal Audit at farm level is done in which farmers who have deviated from the NPM protocols are identified and

Box No. 1

Experience of Mrs. Chanda Bai Radeshyam with bio-repellent unit

Chanda Bai Radeshyam who hailed from Palka village is a member of Pooja Pragati Samuh, a SPS promoted SHG. She is an agricultural labour and does not own farm land. She has been an active member in the farmers group in the village. She participated in the training of making bio-pest repellents in 2015 and wanted to try it as an income generation activity. Initially she sold bio-pesticides to the neighbourhood farmers. As they got good results, she got more orders from the farmers from the surrounding villages. With that she has set up a bio-pesticide production unit. SPS supported her with the necessary equipment to expand her unit. Her main products are *Paanch Pati Khada, Char chutney, Nimboli Khada, Neem ark, and Beejamrut* and she sells them at the price of Rs. 30 per litre. While farmers pay Rs. 15 per litre, the balance is contributed by SPS. Chanda Bai spends around Rs. 500-700 to make 100 litres of these bio-pest repellents, which includes the cost of raw materials and labour. During 2019-20, she produced around 1500 litres of bio-pest repellents and her turnover was Rs. 45000.

subsequently removed from the list of NPM farmers.

10. Approved Farmers List (AFL) is made based on the internal audit report at the Agriculture Programme level.

11. These approved farmers are advised and monitored to keep their harvested NPM produce separately at their field/home and ensure that there is no contact with the non-NPM produce and unwanted chemicals.

3. Facilitating aggregation, processing and marketing of NPM produce

The objective of the Crop Produce Aggregation Programme of SPS is to link small and marginal farmers who have adopted NPM approach to organised markets and enable them to benefit from remunerative prices. SPS has been engaged in commodity aggregation and marketing since 2008. In 2012, Ram Rahim Pragati Producer Company Ltd (RRPPCL), a women-farmer-owned Farmers Producer Organisation (FPO), was set up as a vehicle for carrying out this activity. RRPPCL deals only with NPM produce and has built a strong and stable business relationship with Safe Harvest Private Limited (SHPL; a company serving as the market arm for more than 30 farmers organisation engaged in promoting NPM agriculture across India), Ramesh Traders, Gramin India Agri. Business, APMCs and Women SHG federations in the nearby area. The FPO

Fig.7 NPM farmers are selling their produce at the aggregation centre set up by RRPPCL

Table 3: Details of NPM produce marketed by RRPPCL

S. No.	NPM Focus	2017-18		2018-19		2019-20		Major Buyer
		NoF*	Qty*(Qtl)	NoF*	Qty*(Qtl)	NoF*	Qty*(Qtl)	
1	Wheat	263	3927.38	797	5163.19	330	8224.68	SHPL, Ramesh Traders
2	Redgram	384	588.59	0	0	147	535.76	SHPL
3	Bengalgram	404	2427.09	525	1591.63	261	2414.72	SHPL, Ramesh Traders
4	Maize	262	5813.68	250	6153.63	0	0	Ramesh Traders, Kasvap Sweetners
5	Greengram	62	152.14	0	0	0	0	SHPL
6	Nimboli	15	44.50	20	44.75	0	0	Nashib Traders
	Total	**1390**	**13955.38**	**1592**	**12953.20**	**738**	**11175.16**	

Note : NoF - Number of Farmers; Qty - Quantity

Fig.8 RRPPCL using hermetic cocoons to store their aggregated produces

facilitated the spread of NPM agriculture by informing farmers before the sowing period that their produce will be brought at a remunerative price through a forward contract. Farmers were supported through provision of high-quality seeds, and training to clean and grade their produce to earn a better price at the time of procurement. The team also monitored if the NPM protocols are properly followed in the company's operating region. Besides selling raw grains, RRPPCL is also engaged in primary processing of wheat, bengalgram, redgram and greengram. Retail packaging was undertaken by RRPPCL on behalf of SHPL on a job work basis. It has a processing unit (Capacity: 1.5 tons per hour) and warehouse at Bagli and utilizes the storage and processing infrastructure (Capacity: 200 tons/day) at Avantee Mega Food Park at Dewas. The details of marketing of NPM focus crops by RRPPCL from 2017-18 to 2019-20 is given in Table 3.

Salient features of process-based quality assurance system pertaining to post-harvest value chain practices followed by RRPPCL are shared below:

3.1 Aggregation

1. RRPPCL does a forward contract agreement with the buyer for a year. For the crops for which they have a forward contract, RRPPCL go for aggregation only from the farmers in the Approved Farmers List (AFL).

2. As soon as the harvesting happens, RRPPCL Aggregation Team visits its member's field and inspects the quality of the harvested produce. On the basis of the quality, farmers are then told whether RRPPCL will be able to procure their commodities or not. From each of the farmers in the AFL, the team takes the sample and sends it to the collection centres.

3. Fresh gunny bags are supplied to farmers for aggregation that mitigate the risk of contamination through gunny bags.

4. Decentralised procurement is followed through collection centers located close to the production locations.

5. Once the aggregation starts, approved farmers bring their produce to the collection centre. At the collection centre, the quality of the brought produce is again checked by adopting the following procedures:

a. A representative sample of the brought produce is drawn out and compared with the earlier sample (which was brought from the field) to see if it is the same produce which was seen at the field.

b. Further, the following quality parameters are measured and noted -

i. Moisture percentage

ii. Foreign matter like mud, dust, kalti, etc. percentage

iii. Other grains/seeds percentage

iv. Infected grain percentage

v. 'Broken and shrunken' percentage

vi. 'Discoloured' percentage

c. Based on the result, the agri-produce is assigned the type of Grade i.e. A, B and C or rejected.

6. Aggregated produce at a collection centre is immediately transported to the safe environment i.e., warehouse or cold storage unit.

7. No part loading is allowed in the vehicle while transporting the produce from one place to another.

Fig.9 RRPPCL staff are packing redgram dal a per the packaging requirement of SHPL

8. At the warehouse, the NPM produce is stored in cocoons i.e., hermetic storage bags with regulated CO2 composition. This technology aids in killing insects in the already infested grains and prevents further infestation.

9. At the cold storage unit, separate chambers are booked which ensures that NPM produce does not come in contact with non-NPM commodities.

3.2 Testing for pesticide residues

1. When harvesting begins, every location draws the sample for a particular crop from the cluster of approved farmers and send it to RRPPCL.

2. Thereafter, RRPPCL mixes all the location sample and a representative sample is drawn from the lot.

3. Representative sample is then sent to third party accredited lab (TUV Lab) for MRL testing.

3.3 Payment procedure

The payment reaches the farmer's bank account within four days of aggregation.

3.4 Processing of NPM produce

1. Processing machineries and plant is thoroughly cleaned before the processing of NPM produce is undertaken.

2. No chemicals and non-NPM produce are allowed in the processing premise.

3. Only authorized persons are allowed to enter in the processing premise.

4. Full time presence of a staff at the processing unit during NPM produce processing.

3.5 Marketing of cleaned, graded and/or processed NPM produce

1. No part loading allowed in the vehicle

2. Fresh packing material used

4. Operational management of NPM intervention

1. Organisational structure and how NPM intervention is layered on other development interventions

As of September 2020, the manpower engaged in NPM intervention in SPS included 6 agricultural professionals, 44 Community Resource Persons, 10 FPO staff and 128 model farmers. The basic operational unit of Agriculture Programme of SPS which undertakes NPM intervention is a location/block. At that geographical level, Agriculture Programme works in an integrated way with Self-Help Programme. Self-Help Programme helps in wider dissemination of NPM interventions, besides credit support. The Crop Produce Aggregation Programme works at the regional level covering many locations. MIS is maintained both at the location level and program level.

2. MIS system for NPM intervention

The detailed data related to NPM intervention is collected manually by CRPs using Group Level Farm Diary. These data are then uploaded in the Krishi Vistar Software developed by SPS. The software attempts to digitise the entire agriculture database such as sowing patterns, manure availability, expenditure on farming inputs, farmer's income, etc. Krishi Vistar Software helps SPS to monitor adoption of NPM practices at farmer, Mitaan and location levels and to generate relevant MIS reports. Thereby it aids in advising the farmers on agricultural practices and managing the NPM intervention based on careful data analysis.

III. BENEFITS REALIZED

It is quite common to use chemical pesticides in most of the locations where SPS has initiated NPM interventions. So, it was an uphill task for SPS to motivate the farmers to explore an agriculture approach alternate to 'high input chemical agriculture'. In the beginning, farmers practiced NPM on some small patch of land, even less than a bigha. But later they have adopted NPM to their whole field on realizing the benefits. The benefits realized from NPM interventions are shared below:

1. **Reduction in cost of cultivation:** NPM farmers realized considerable reduction in cost of cultivation when compared to conventional farmers. The reduction in cost of cultivation was around Rs. 6000/ha in the case of wheat and Rs. 5000/ha in the case of maize.

2. **Realisation of additional price:** NPM farmers realized additional farmgate price when compared to local mandi price when they sold their produce to RRPPCL. Besides additional price, farmers also benefited from no out-of-pocket expenses for payment for transport and commission, transparency in procurement process, and guaranteed and timely payment by RRPPCL.

3. **Shifting to cropping systems less vulnerable to pest attack:** Crop damage in cotton due to pink boll worm and in soybean due to girdle beetle was so high that a considerable number of farmers have shifted to NPM maize.

4. **Increase in crop and varietal diversity:** Crop diversity has increased with the adoption of mixed farming and intercropping as part of NPM approach. Farmers have included castor, sesame, redgram, blackgram, greengram and sorghum in their cropping systems. Farmers who were used to grow maize as a 'sole' crop have adopted intercropping. Varietal diversity has increased with the adoption of new varieties namely Lok 1 and Poorna (HI-1544) wheat varieties that need less irrigation, Durum wheat varieties (Malwa Shakti, Malav Raaj, Malav Kirti and Poshan) and Vishal, Kak -2, Sweta, J.J 11 and JAKI-9218 varieties of bengalgram.

5. **Increase in skills and knowledge:** Farmers who have adopted NPM approach, especially women farmers, improved their skills and knowledge on the following aspects:

Box No. 2

Securing the right price through NPM and RRPPCL

Farmer Manjubai Mangilal, a resident of the village of Laxminagar is associated with the Asha Kisan group since 2015. She has planted *lal tuar* (redgram variety with red kernals) in her two bigha land in the kharif season during 2017-18. She adopted NPM methods to manage her crop. After harvesting, the farmer showed the product sample to the *seth,* the local trader, who said that he can offer a price of Rs. 3,500 per quintal. Meanwhile, Mitaan Mukesh Kirade suggested that she can explore marketing through RRPPCL. She showed the sample to RRPPCL, which offered to pay Rs. 3,800 per quintal. She decided to sell her produce to RRPPCL. All of her produce was collected by the company from her house. In retrospect, Manjubai says that she made more profit because she saved labour and transport costs due to the favorable aggregation procedures of RRPPCL.

Meerabai is the member of Manglasri Farmers' Group and has been associated with the group since 2014. In 2017-18, she sowed sponge gourd in her agricultural land of two bighas. At the time of preparation of the field, she added 10 quintal vermi compost and 14 quintal NADEP compost manure. Along with this, she used liquid manure with every irrigation. She followed all the procedures and practices which she got to know during the NPM training. The quality of her produce attracted buyers. Customers were willing to buy her produce at a higher rate. While other farmers were being able to sell sponge gourd at 25 rupees per kg, she was able to sell her produce at 32 rupees per kg. During the season, she harvested the produce nine times from the field and earned a consolidated amount of 42,500 rupees.

Fig.10 Mirabai making bio-pest repellent

a. Preparation of organic fertilizers at farm level

b. Adoption of optimum spacing

c. Seed germination tests and seed treatment

d. Preparation of different kinds of pest repellents suited for different crops

e. Methods for increasing water use efficiency like dry sowing, choosing crops and varieties requiring less irrigation and micro-irrigation techniques.

f. Trends in market prices for different agricultural commodities and

g. Risk management options like PMFBY scheme

6. Widely adopted production practices recommended as part of NPM package of practices include, i) Boundary plantation, ii) Summer ploughing, iii) Application of organic manures, iv) Use of clean seed materials, v) Seed treatment, vi) Optimum planting time and spacing, vii) Improved irrigation management, viii) Bird perches, and ix) Application of liquid manures

7. Increase in awareness on the harmful effects of chemical pesticides among the wider society

8. Increase in consumption of pesticide free foods: As a large share of NPM farmers reached by SPS belongs to marginal and small farmers category, considerable part of their NPM produce was utilized for self-consumption. Furthermore, as only 10 to 25% of the total NPM farmers were covered under collective marketing initiative of RRPPCL, a large part of surplus of NPM farmers were sold in the local market as regular agricultural produce. This would have resulted in consumption of significant quantities of NPM produce by non-producing families in the location and the region.

9. Grooming of master farmers and local champions: In the working villages, 128 model farmers have emerged who serves as the inspiration to fellow farmers.

10. Creation of community infrastructure: With the engagement in NPM initiative, 23 village level pest repellent units were set up by the local community. Similarly, two village level storage units were set up in Kantaphod and Pandu talab and one centralized warehouse and a processing unit were established in Bagli block. Hermetic cocoons were set up for managing pest infestation during storage and to preserve the quality of the produce.

11. Development of community-level capacity to intervene in the agri-value chains: Earlier the agri produce of the farmers were sold directly to the local traders. With the engagement in NPM initiative, collective capacity is built to ensure cleaning and

Box No. 3

Marketing of NPM produce during COVID 19 lockdown

Fig.11 RRPPCL distributing wheat flour to their SHG memebers in Bagli location during lockdown

It was the harvest season for all the rabi crops when lockdown was announced on 23rd March 2020. Transportation was shut down except for the emergency services. Farmers in the SPS working area were panicked. Local traders approached small and marginal farmers at their door step and bought their produce at a lower price. On the other hand, food supply chain of the members of SHG federation was disrupted. Migrants were returning to their homes adding to the number of mouths to be fed. In this situation, RRPPCL team took a crucial step to get a special permission from the district administration to aggregate the wheat and bengalgram from their working area. RRPPCL aggregated close to 120 MT of wheat and transported the same to Avantee Food Park in Dewas for processing. Then it was distributed to 12,000 women through Self Help Groups along with other necessary groceries. Each kit had 10 Kg of atta, the quality of which was appreciated by members across all locations. This is the first time RRPPCL has distributed such a huge quantity of NPM food produce to the local people. Farmers received a fair price for their commodity and the poor people got the opportunity to eat quality food during the nationwide lock down.

grading of the produce before selling. Capacity is also built to undertake value addition through primary processing based on buyers' needs. For example, wheat and bengalgram are sold as 'flour' instead of 'grains' to realise better prices. RRPPCL also has taken license for packaging and undertakes packaging of the product based on the demand from the buyers. Working relationship was built by RRPPCL with a set of buyers and with financial organisations.

12. Empowerment of small farmers, especially women farmers: NPM farmers gained increased control over their farming livelihoods. Women NPM farmers and their federations and FPO were recognized at local, regional and national levels for their contribution for making possible pesticide-free and safe food chains.

13. Other benefits:

a. Due to demand from farmers groups and their federations, local mandis have started their operations, thereby benefiting the wider society.

b. Small number of NPM farmers have moved towards farming without use of any agro-chemicals, including chemical fertilizers.

IV. KEY LEARNINGS

1. The major pest and diseases of focus crops can be addressed effectively by the adoption of context specific NPM package of practices evolved in collaboration with farmers.

2. It is better to start with crops where the feasibility of applying NPM methods is more instead of difficult crops for establishing the concept among the farmers; Once the NPM program reaches a scale, then difficult crops can be taken for intervention.

3. Major share of NPM farmers continued with their NPM practices even though they did not participate in the collective marketing intervention by RRPPCL; this indicates that NPM farmers benefited significantly even without participating in collective marketing, thereby pointing the scope for large scale replication.

4. Going for forward contracts with the buyers aids in crop planning with member farmers by FPO.

5. Considerable price advantage realized by the FPO members when FPO undertakes value addition and packaging.

6. There is high scope for scaling up aggregation and collective marketing of NPM produce by RRPPCL, if it is able to create additional demand and identify suitable new buyers. Moving in this direction will also address the current mismatch in crop and varietal diversity promoted as part of Agricultural Programme and limited set of crops and varieties procured by RRPPCL.

7. Regular group meetings, monitoring and support by agricultural team and exposure to nearby farms for peer-to-peer learning has improved the adherence of the farmers to NPM protocols.

8. NPM farmers follow the NPM Protocols willingly as they see participation in NPM intervention as part of their participation in multiple development interventions offered by SPS.

9. NPM Guarantee System (i.e.,) Process-based Internal Control System (ICS) at production and post-production levels served as the backbone of the NPM intervention in delivering quality safe pesticide-free produce to the wider society.

10. With saturation approach for expansion, introduction of Krishi Vistar software and skill upgradation of staff, the number of NPM farmers a CRP can handle has considerably increased, leading to significant reduction in cost of NPM intervention management.

11. Some of NPM package of practices like farm bunding and silt application can be promoted through MNREGA program, watershed schemes and other government funded schemes.

12. **Effectively layering the NPM intervention over other development interventions:** Besides capitalizing for mobilizing farmers, SPS has by design effectively integrated NPM production and value chain interventions with the development interventions on Water management, Crop produce aggregation and Self-Help Programme. Though NPM intervention was implemented as part of the Sustainable Agriculture Programme, its effectiveness was improved by other agriculture interventions like soil fertility improvement, land use planning, diversification of part of land for horticulture and increasing water use efficiency. NPM intervention is integrated with Crop produce aggregation programme executed through RRPPCL and with Self-Help Programme in terms of mobilizing people for training on NPM practices, credit supply, and selling the produces to SHG members. The experience of

SPS indicates that NPM approach can be effectively integrated with watershed schemes, women SHG based development interventions, FPO promotion, etc., which are widely implemented across India.

V. CONCLUSION

It can be seen from the experience of NPM interventions of SPS that it is quite feasible to promote NPM approach among small and marginal farmers even in difficult geographies. There is a large scope for scaling up NPM approach in the backward regions in Central, Northern and Eastern India, as majority of them are in transition from traditional less intensive farming systems to chemical intensive farming. The benefits realized by the farming communities served by the SPS indicates that deployment of development investment in NPM approach in these areas will aid a lot in establishing a viable alternative to large numbers of farmers and in building a base for safe pesticide-free wholesome food systems. Grassroot organisations interested in initiating NPM interventions in their area can learn a lot from SPS, mainly in terms of operational systems and integrated approach. SPS, being an organisation with broader mandate to empower small and marginal farmers in the backward regions, will be interested to share its learnings to these interested organisations.

Become a Member of NPM Network

We welcome everyone to become part of our movement, you can join the NPM Network google group. As a prestigious member of our Network, you will get access to lastest News, articles, events, exclusive webinars, and contacts in Non-Pesticidal Management Network.

To know more details about the NPM Network, please visit our website
www.npmnetwork.org

For any queries, you can send an email to
info@npmnetwork.org