

# Towards Doubling the Farmers' Income in Bundelkhand Region

Process Document



**Implemented by**



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Process Document  
on  
Towards Doubling the Farmers' Income



Based on Experiences under the Project  
implemented by



Abhyuday Sansthan

In Support of



HDFC Bank PARIVARTAN

# Process Document on Towards Doubling the Farmers' Income

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# Process Document on Towards Doubling the Farmers' Income

## Background

Farming is still a major source of livelihood of the majority of people in the country. In fact, agriculture is the primary source of livelihood of about 58% of population of the country. India ranks second in the world in terms of arable land. On the other hand, India ranks 74 out of 113 major countries in terms of food security index. Contribution of agriculture and allied sectors in India's GDP is around 17%. Unfortunately, due to the stress on the natural resources and changing climatic conditions and several other reasons, returns from the agriculture are not up to the potential. Farmers are still remained among the most vulnerable section of our social system. Many a times they fall prey to money lenders and become part of the vicious cycle of loan and interest.

According to a survey, Agricultural GDP, over eight years to 2015, increased, on average, 10.9% per annum, the highest in India and higher than the national average of 4.3%. Despite the growth, the state has been plagued by farmers' protests: the 2017 farmers' protest demanding loan waivers and better prices in Mandsaur district spread to six other districts and led to deaths of six farmers in police firing. One of the major causes of this unrest was the low returns and high risks of farmers involved in agriculture.

In this context, our prime minister in 2017 announced to give priority enhance the farming income to double within five years. Many of the villages in Sagar district, Madhya Pradesh were grappling with similar challenges of the water crisis. Sagar along with adjoining districts of Madhya Pradesh forms part of one of the most underdeveloped and backward zones of the State. To address the challenges of this region and help people come out of the adverse effects of drought such as hunger and food insecurity the HRDP<sup>1</sup> (Holistic Rural Development Project) was launched in 20 villages of Sagar by Abhuday Sansthan with the support of HDFC Bank (Parivartan). The intervention under HRDP comprises facilitating soft skills and physical intervention in respect of water resource development, land treatment, allied practices as a potential business, safe drinking water, forest development, the input of renewable energy options, plantation, water recharging, waste disposal.

## Introduction to the intervention location

The intervention, being supported by HDFC Bank (Parivartan) targets *Saliya Ghazi, Dalpatpur, Belai, Giltoara, Sultanpura, Masanjhiri, Suatala and Kajrai villages* of Sagar District of Madhya Pradesh. The region is characterized by a typical subtropical climate marked with long spells of summer. The annual average rainfall has declined from 902 to 846mm over the years. May is the hottest month of the year with temperature shooting up to 48.30 °C, which further went up to 49.09 °C this year. Sagar, falls the Bundelkhand region, which is known for the depleting natural resources, reducing agriculture returns,

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<sup>1</sup> The Holistic Rural Develop Project was started in the year 2017 in 20 villages of Sagar district in Madhya Pradesh with a vision to ensure the socio-economic development of vulnerable communities through participatory and convergence models. The project primarily targets 4268 families (population of 19, 123) of 20 villages under five core components such as; NRM, Livelihood, Education, Health, and WASH of the sustainable development goals (SDGs).



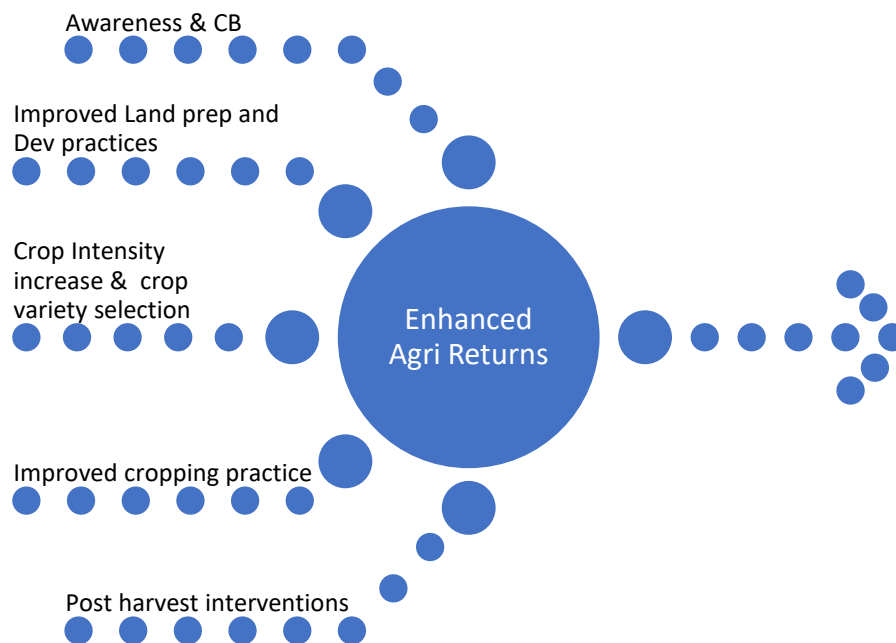
extreme climatic events, increasing frequency of drought etc. Being in the region, all the situations are also common in the project target area.

### Enhancing the Agriculture Income

For doubling the farmers' income multipronged approach had been adopted in the project. This is required as there are various aspects which need to be covered and various potentials, which need to be tapped to enhance the income of the farmers/farming community.

Various aspects can be categorized into the following points:

- Cropping Intensity (two crop to three crop system)
- Crop and crop variety selection
- Cropping practices
- Post-harvest interventions
- Training of farmers and strengthening Institutional capacities



### Awareness and Capacity Building Among Farmers

While taking up any intervention among farmers, it is important that the project team and farmers both side understand each other's perspective. Once both side are on one platform of understanding it is easier to build capacity of farmers and intervene in the leadership of farmers' themselves assuring the sustainability of efforts. Following activities have been taken up in this context:

#### *Orientation Meetings with Farmers*

Initial meetings were conducted with farmers to orient them with the project objectives and to understand their constraints, perspectives and priorities. Based on the discussions it has been identified that returns from agriculture can be significantly be increased by using the human and natural resources in more efficient manner. Especially water resource scarcity is one reason which is affecting the agriculture in a serious manner. Whereas many farmers in other part of the country are







Figure 1: Strong Farmers and ownership are key to success

taking three crops in a year, majority of the farmers in the Bundelkhand region are taking one or two crops only in a year. It also came up during the discussions that some new technologies can also be tried which are being used in other part of the country to assess their viability in the project area.

#### Exposure Visit

Farmers were taken to the exposure visit to give them opportunity to see the practice and interact with experts and practicing farmers. 250 farmers were taken to the KVK, Sagar for exposure visit to see improved agriculture techniques, NRM activities and Krishak Chaupal.

#### Farmers' Training

Various training programs on cultivation practices were organized to build the farmers' capacity. Total 456 farmers have been trained on Machan Cultivation, use of drip irrigation, poly mulching, seed treatment, organic cultivation etc. Farmers were also made aware during Krishak Chaupals by experts and practicing farmers.

#### Farmers' Day Celebration

An event was organized to celebrate the success of the interventions and of the farmers under the project. This event not only encouraged the farmers who took the lead and as well as other farmers but also worked as a tool to share and demonstrate the interventions at larger scale. Various relevant line departments and Mr Harsh Yadav, Cabinet Minister (Ministry of Cottage Industries) of Madhya Pradesh participated in the event to honor and encourage the farmers.

#### Land Preparation and Development:

Land / soil is the most important resource for agriculture. It needs to be in the state which supports the cultivation. To ensure that it can save the water by conserving moisture, bunding is an important activity. Following activities were promoted in the farmers' fields:

- Field bunding:  
To prevent the water outflow from the field
- Land levelling:  
To maximize the moisture retention in the field reduce the variation of moisture level across the field
- Tillage:  
To optimize the tilth of the soil to support cultivation
- Ploughing:



Figure 2: Land preparation for efficient moisture utilization



To turn over the soil to mix it up to maintain the nutrients levels in top layer and also to loosen the soil

### Cropping Intensity

Cropping intensity is expressed in terms of percentage which reflects the actual area cultivated as compared to the area under cultivation, in a year. Thus, cropping intensity can be more than 100%. Most of the arable land in the project area is under two or one crops. To enhance the crop intensity,



Figure 3 Crop demonstration

Zayad crop was introduced. This would help not only in enhancing the income but also in distributing the returns across the time line.

Seasonal vegetables and other cash crop cultivation has been demonstrated under this intervention with 40 farmers in 40 acres of land. Various activities from field bunding, land preparation, inter-culture operations, growth monitoring to minor irrigation and market linkages were introduced among the farmers for Zayad crops. Cultivation in the Zayad was not being taken up and completely introduced under

the project. This activity alone has potential to improve the returns by about 40%, considering that most of the crops in this season are cash crops and this chunk of income is complete addition in their existing income. In addition, farmers were made aware of some new technological options/interventions. These are being given below:

- Green House
- Machan cultivation
- Drip Irrigation, and
- Poly mulching

Major beneficiary of these interventions is SC/ST/OBC and small and marginal farmers.

### Crop Variety Selection

Change of crop seed, crops and fields in due course of time is must to keep the productivity intact. Many a times farmers keep sowing the same variety and crop in same field for many years. This causes the loss of some specific nutrients and chances of attack of some diseases / insects. Thus, changing the crop variety and fields has been encouraged through the project interventions. Following crops and crop varieties have been promoted:

- Wheat: GW 344, 1544
- Gram: 315
- Soybean: 2034, 9560
- Black Lintel
- Groundnuts

In last three years, the interventions have been taken up with 690 farmers and in 690 acres. All the project interventions. Target beneficiaries were SC/ST/OBC/ small and marginal farmers.





On an average 12-15 % enhancement in base productivity of 7-8 quintal per acre has been reported by the farmers only due to this specific intervention.

#### Cropping Practices/Interculture Operations:



Cropping practices and interculture operations are critical but least recognized by farmers. Mostly it has been considered insignificant point to discuss the cultivation practices, as farmers consider what they are doing for many years is good and there is no scope to improve on these practices. However, various aspects of cultivation have been discussed with the farmers and they were made aware about the potential to change the cultivation practices to improve the production. Following practices were introduced as an option to improve production levels:

#### *Multi-layer farming (new practice)*

Multi-layer farming is the efficient utilization of land and water resource by taking the multiple crops in same field at the same time by sharing the vertical space in air and also below ground to reduce competition and best utilization of water and nutrients in different layers of the soil, as well as to spread over the canopy at various levels without affecting much the other crop. This practice not only enhance the income, use the available resources efficiently reduce the water and nutrient losses by preventing them from leaching down but also reduce the vulnerability by providing the farmer with multiple crops with different vulnerabilities and also by spreading the returns over time.

This practice needs efforts, understanding of various crops and intense attention from the farmer, thus it was demonstrated with small number of farmers (only 5). All beneficiaries were from OBC category. According to initial estimates there was enhancement of 30-40% (Rs 25-30,000) in returns to those who adopted this practice. Additional benefit of adopting this practice is nutritional security to the farmers' families.

#### *Drip irrigation and poly mulching (new technology)*

Drip irrigation is water saving irrigation practice. Its efficiency goes up to about 98% as compared to the normal flooding irrigation efficiency of about 38-40% (maximum). That means only 40% of water applied as irrigation can be used by the crops in flood irrigation method and in case of drip irrigation up to 98% (about



Figure 4: Drip Irrigation along with Poly mulching (Pappu Lodhi in Saliya Gaji)





90% in normal conditions) of water applied can be used by the crop. In this method, the water is applied directly into the plants root zone area to enhance the use. This also reduces the weed growth and competition in use of nutrient and water between weed and crop plants, thus reducing the cost further by reducing the labour required for interculture operation of weeding.

Considering the water resource scarcity in the area, the drip irrigation technology was introduced and demonstrated with 3 farmers in 3 acres of total land for cash /vegetable crop cultivation. The practice is capital intensive and farmers need to be convinced about its cost benefit aspect before they opt for this option for irrigation. That is why the demonstration was carried out at small scale only.

#### *Cattle fodder:*

To ensure the nutrition and fodder security for livestock in the project and surrounding area, fodder cultivation was also promoted under the project. This not only would provide an source of income for farmers with small /poor quality land holdings but also to the farmers having- livestock based livelihoods. Azola, berseem, bajra, jai, chari etc were promoted for food and nutrition security of livestock. In the process, all relevant activities for cultivation were demonstrated with 10 farmers/acres. This was completely new practice and the returns from the fodder production are additional, though not much, but still 7-10% additional returns are expected to the fodder producers. Benefits to livestock holders in respect of improved milk production has not yet been assessed.



#### *Kitchen garden (new practice)*

Kitchen garden activity was initiated under the project with 464 farmers' families. They have been provided with seasonal vegetable seed kits (bottle gourd, radish, carrot, spinach, coriander, fenugreek, etc). the seed kits have enough seeds for the land patch of 10' x 20' which almost every household possess in its backyard. This activity was more focused on nutritional security of women and kids by making the vegetables and fruits accessible to households without extra expenditure. As other interventions, the target of the intervention were SC/ST/OBC/ SME farmers households.



Figure 5: Kitchen Gardens ensure nutritional security among households

#### *Cash Crop Cultivation:*

Cash crop cultivation was demonstrated with 160 SC/ST/OBC/BPL/SM farmers. Following crops/crop varieties were promoted under the intervention:

- Garlic: Desi
- Ginger: Desi
- Onion: Bhima Shakti, Nashik,
- Potato: S-1, 3797, Pukhraj
- Tomato





In addition, new technologies were also mixed with the cultivation practices like use of green house, drip irrigation, poly mulching etc. This intervention also has potential to improve the returns by 20-35% depending on the crop and area replaced by these crops.

*Organic cultivation:*

tasty. Thus, these products fetch higher price in the market. Though, there needs to be many steps, norms and formalities to get the organic certificate by the produce, efforts made to enhance the organic cultivation method and reduce the chemical load to achieve the organic farming in phased manner. Following activities were taken up under this category of interventions:



- Organic compost promotion
- Integrated Pest and Nutrient Management (IPNM)
- Seed treatment using bio -options

Figure 6: Economic Vermi-composting models; Rakesh Gaud from Suatala

*Post-Harvest Interventions:*

Post-Harvest interventions were also taken up to enhance the returns. Some of the important interventions are as follows:

*Zero Cooling Chambers:*



Figure 7: Zero Cooling Chamber of Pawan Patel of Suatala village

Zero Energy Cooling Chamber (ZECC) of Evaporative Cooling chambers are a type of evaporative cooler, which are simple and inexpensive ways to keep vegetables fresh without the use of electricity. It involves a structure of size 5x4x4 feet made up of bricks, sand, cement, straw etc. Double wall erection of brick at the height of 4 feet leaving gap of 7.5 cm in between two walls for filling of river sand. Thee technology was demonstrated with two (2) farmers and is quite useful to store the vegetables and produces with short shelf life for longer periods to enhance the shelf life and reduce the daily/routine losses

of Rs 500-600 per day and that's too without dependency on electricity. Evaporative principles are





used to keep the chamber cool. The chamber also provides storage space to store about 2.5 – 3.0 ton for vegetables/other perishable farm produce.

### *Drip Irrigation*

As described earlier this is high frequency low volume irrigation method. Irrigates only root zone and irrigation efficiency can go up to 98%



*Figure 8: Shadenet/Greenhouse for micro environment control of Pawan Patel of Suatala village Maigua Panchayat*

### *Poly Mulching*

Mulching is the process of covering the soil surface to maintain the optimum temperature and moisture levels in the soil for the growth of roots in the soil. This helps in the

### *Greenhouse/Shadenet*

Greenhouse and shadenet technologies are tool to create optimum temperature and humidity levels to promote plant growth mostly in nursery stage or for cash/vegetable crops. Multilevel

production is possible and growth rates is quite higher as compared to open fields.

### *Machan Kheti*

In multi-layer farming, one layer is to take viles/creepers crops at certain height through stretching a net above certain height from the ground. These nets are called machan. These machans help to reduce the attack of insects and pests on these crops and also enhance the growth of fruits. In addition to leaving the ground surface for another vegetable crops.



*Figure 9: Demonstration of Machan Kheti*

### *Impact of the Interventions:*

Various interventions have been taken up with different sets of farmers I initial phase. This was done to not expose the marginal farmers section to various vulnerabilities. It was observed that enhancement of the returns is as much as 30-40% from some of the interventions. Overall, the returns vary from 10% to 40% through the various interventions. it is also possible to overlap these interventions with same set of farmers depending on their capacity and willingness to get the maximum benefits.



## Key success factors and way ahead:

### Approach

The approach of the interventions was to create demand for the interventions by making the farmers aware of the constraints and potentials and encourage them for taking conscious efforts. Thereafter the project facilitated the interventions by providing technology, knowledge and strengthening their institutional capacities

### Support to marginalized farmer section

Conscious efforts were made to ensure that all the beneficiaries are from SC/ST/OBC/SMF section. This helped to showcase that the interventions not require much resources and everyone can adopt these practices to reap the benefits.

### Strengthening Capacities:

In addition to strengthen the capacities of individual farmers by training, exposure visits and other activities, institutional capacities were also enhanced by organizing the in groups and linking with resource institutions. This would help in ensuring the sustainability of the efforts.





## Picture Gallery



11: Khemchand Patel from Suatala Village



10: Ramvati Patel from village Bhainsa, of Bhainsa Panchayat



13: Anita Patel from Bhainsa



12: Preetam Chdhar from Suatala



Azola Cultivation of Anil Pateria from Saliya Gaji



15 Khemchand Patel from Bhainsa



Sprayer Pump, Ashish Thakur from SULTanpura



Ramvati Patel from Bhainsa Village demonstrating IPM





*Drip Irrigation System ; Pappu Lodhi of Saliya Gaji*



*Seed Bank, Meera bai Patel of Village Grunt*



*Cash Crop Production*



*Hariram Vishwakarma of Masanjhari Village doing organic compost production*



*Kitchen Garden of Daya Rani Gaud of village Hanauta*



*Multilayer cropping of Khemchand Patel at Bhainsa village*

