

Learning from the Ground

Insights & Experiences from HRDP, Shravasti, U.P.



Learning from the Ground:
Insights & Experiences from HRDP, Shrawasti, U.P.

© Gorakhpur Environmental Action Group (GEAG), 2023

Concept **Dr. Shiraz A. Wajih**

Compiled by **Ravi Prakash Mishra
Shreya Chaturvedi**

Edited by **Sabita Singh**

Support **Bijay Prakash
Daya Ram
Sanjay Verma
Ram Kumar Dubey**

Photo credits **Gorakhpur Environmental Action Group**

Supported by **HDFC Bank, CSR**

This document has been developed as an outcome of a project title "**Holistic Rural Development project in Shrawasti**" supported by HDFC Bank, CSR. The document outlines the outcomes of five thematic areas of HDFC Bank, Partivartan in order to bring both tangible and intangible development in the intervention villages. It also captures the stories of farmers who have adopted innovative agricultural practices to deal with climate uncertainties and thereby improved their livelihoods and contributed to be the sustainable development goals.

Acknowledges We are grateful to HDFC Bank, especially Sri Arvind Singh and Ms. Divya Singh for their continued support and guidance.

Layout & design **Raj Kanti Gupta**

Year **March 2023**

Published by **Gorakhpur Environmental Action Group**
HIG 1/4, Siddharthpuram, Taramandal Raod
Gorakhpur- 273016 (U.P.) INDIA
Phone # 0551 2230004, Fax # 0551 2230005
Email : geagindia@gmail.com,
Website : www.geagindia.org

Learning from the Ground
Insights & Experiences from
HRDP, Shravasti, U.P.



CASE STUDY

Azolla

An inexpensive alternative feed for Livestock

Shravasti district is amongst one of the most backward districts of Uttar Pradesh. More than 80% of its inhabitants are smallholder and marginal farmers whose livelihoods are dependent on farming and livestock rearing. They face an uncertain, difficult future due to shrinkage in cultivable land because to subdivision of land holdings. This restricts them to grow paddy as the main crop along with a few vegetables. Due to this constraint, small holder farmers are unable to grow cattle feed. This leads to nutrient deficiency in cattle, which makes them susceptible to disease and virus attacks, and brings about a decrease in milk production. Another issue is the high cost of animal feed. Thus, the quest for readily available and economical alternative sources has become critical for breeders seeking to minimize the cost of animal husbandry.

Azolla, from the family *Salviniaceae*, is an invasive plant that grows faster in freshwater lakes. It has a symbiotic relationship with the nitrogen-fixing blue-green algae *Anabaena* which increases the protein content of Azolla, making it one of the greatest alternative feed ingredients as a source of protein. It has vitamins (Beta Carotene, vitamin A, vitamin B12), minerals (calcium,

potassium, phosphorus, ferrous, magnesium, copper, etc.), and antioxidants, this makes it suitable to be fed to animals such as cows, buffaloes, sheep, goats, and rabbits.

Since, it is easily digestible, it increases feed efficiency as well as milk production by 15-20%. This makes

Azolla a good source of alternative low-cost feed for animals. It can also be used as green fodder, and hence also called 'Green Gold'.

For Azolla cultivation, the following steps are followed:

1. Dig a pit of dimensions of 6×4 sqft , with all four corners at the same height to maintain a uniform water level.
2. Evenly spread 2.5-3cm of local clean soil over the sheet.
3. Dissolve about 2-3 kg of cow dung in 10 L of water and add the mixture evenly throughout the pit.
4. Add 1 kg of fresh and pure Azolla incubated in the pit and slowly sprinkle water over it.
5. After every 7 days add 1 kg SSP in the mixture.
6. Azolla multiplies rapidly and within 15-20 days the mixture is prepared. Everyday 1.5-2 kg Azolla can be collected to feed the cattle.

1 kg Azolla culture costs Rs. 150 which lasts for 15 days, if 2 kg is used every day. This saves Rs. 40/ day in comparison to the market-based animal feed. Currently in the intervention area, 24 farmers are practicing Azolla farming, saving around Rs. 40-60/ day and earning an extra income on milk production of Rs. 6-7/litre/day.

Shanti Devi a resident of Kevalpur, a small village in Hariharpur Rani Block of Shravasti shares,

“From 18 January I started feeding 500 gm/ day azolla to my cows twice a day. I observed an increase in milk production by 1 litre after 3 days. In addition to that the fat content of the milk too increased which fetched me a market price of Rs. 38 instead of Rs 32, which I got earlier. I believe Azolla to be an excellent livestock feed.”



Narendra Sharma of Mohammadpur Kala Village adds,

“I gave Azolla to my cows and buffaloes and found that the fat in the milk increased. I also credit to the regular use of Azolla the fertility of one of my previously sterile cows.”





CASE STUDY

Intercropping

Intercropping of maize and vegetables as an effective solution to increase soil fertility and food grain production

Reduction in the size of cultivable land, severe soil degradation and a consequent drop in crop yields due to climate change are constant threats faced by the smallholder farmers of Shravasti district, Uttar Pradesh. Farming has turned out to be a high-input and high-risk affair for them. Further, the district with 80% small and marginal farmers receives erratic rainfall which results in waterlogging, further jeopardising the livelihood security of these smallholders.

In order to cope up with the increasing vulnerability and climate related disasters, the GEAG team suggested intercropping system, as a climate resilient solution to the farmer community. Intercropping is the practice of growing two or more crops together in the same piece of land in a stipulated time period, resulting in production of greater yield.

The advantages of intercropping are:

1. It gives additional income/ area compared to sole cropping.
2. It increases soil fertility, reduces soil runoffs and helps controls weed.
3. The major advantage of intercropping is that it makes a more efficient use of the available resources, using a mixture of crops that are based on the complementary utilization of growth resources by each of the component crops.

It is beneficial for smallholder farmers as it can maximize profit, minimize risk, conserve soil, improve soil fertility and control weed, pests and diseases; thus further reducing the crop vulnerability.

Farmers were given trainings on Intercropping Farming through demonstrations.

- ◆ In Rabi season, maize seeds were sprinkled in the field in east to west direction in order to ensure that the sunlight reaches the crop during winter.
- ◆ 2:1 ratio of rows was maintained, where in 2 rows maize and in 1 row black eyed peas were cultivated.

Black eyed peas leaves also serve as fertilizer for soil and provide nutrient to maize, as well as increase fertility of the soil.

Munakka Devi w/o Rajaram was one of the 22 farmers from the intervention area to carry out the change process by scrapping the traditional monocropping farming and adopting the climate resilient intercropping farming. She cultivated black eyed peas

and maize in 1 acre of agricultural field, and the following table details the profit gained:

Input Cost		Output Cost		
Input	Cost (Rs.)	Produce	Cost (Rs.)	Profit (Rs.)
Organic Manure	No Cost	Corn cob	16,000	
Seed (4212 variety)	2,200	Seeds	29,700	
Labour Cost	7,200	Black eyed vegetable	6,000	
Bio-pest repellent	300			
Irrigation (Solar pump)	600			
Transportation	1,800			
Total	12,100		51,700	39,600

Munakka Devi shares,

“After experiencing the benefits of intercropping, I would suggest that it's the best farming technique for small holders in the current climate and change scenario as it safeguards the livelihood of the poor.”





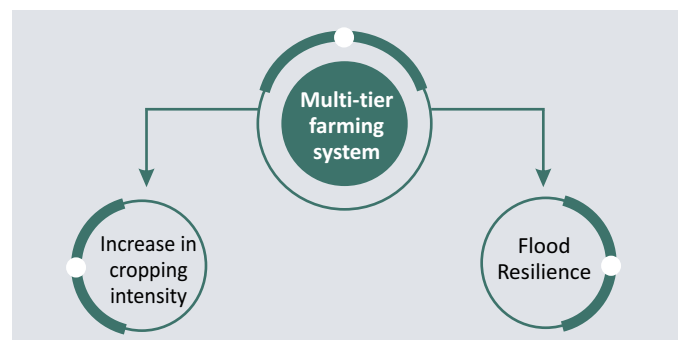
CASE STUDY

Machan/Multi-tier farming system

A boon for smallholder farmers to boost income

Shravasti district is one of the most backward areas of Uttar Pradesh. The area is marked by extreme temperature events and erratic rainfall causing flood and waterlogging across the district. Smallholder farmers of Godpurva village, Hariharpur Rani Block in Shravasti district are one of the communities most affected by this waterlogging which often results in increased pest attack, disease outbreaks and low agriculture productivity. The problem is persistent in this area, which often undermines their household food and incomes, as well as affects the livelihood security of these marginal farmers. In order to address the challenges of small landholders, the community was introduced to the concept of Machan, a multi-tier farming system.

Machan system increases production, as it utilizes the same patch of land for multiple crops in a multi-tier system. It ensures that each crop gets ample sunlight, water, and air, and protects the crops from getting damaged in waterlogged areas. The benefits are as follows:





Amber Lal shares, “Earlier I used to grow only Brinjals and Sponge gourd but as the area is affected by floods, the vegetables would get destroyed. But ever since I have begun to follow this type of farming, I am able to grow 7-8 varieties of vegetable in the same piece of land. The machan system is not only flood resistant, but also protects my vegetables.”

On an average, a small holder farmer earns about Rs. 59,185 from a bigha of land through *machan* farming. This is more than twice his earnings of around Rs. 24,985 through the earlier followed traditional method.

Champavati says, “My dream of an increased income was realized when GEAG with the support of HDFC Bank CSR under the Holistic Rural Development project organized a training and awareness programme on climate resilient agriculture. Under it, machan farming was demonstrated through the creation of Farmer Field Schools. Its implementation brought a much needed desirable change in my income.”

The *machan* structures are built with easily available local wood, rope, and bamboo. Farmers can create *machan* with wires also. Generally, nine feet long bamboo poles are used. The measurement varies depending on the plot size, but it is usually of the dimensions 10 feet x 8 feet. *Machan* farming has been adopted by 198 farmers in the block. Now, farmers can harvest different crops at different time periods, avoid risks associated with monoculture and also increase their income. The usual pattern of this farming in different seasons is:

Season	Multi-Tier System		
	Above the ground	On the ground	Beneath the ground
Kharif	Sponge gourd/ Bitter ground/ Beans	Maize/Red amaranth	Turmeric/ Ginger
Rabi	Bottle gourd/ Beans/Pointed gourd	Coriander/ Spinach/ Goose feet	Radish/ Carrot/Turnip Beetroot





CASE STUDY

Matka Khad

A sustainable solution to enhance the income of small and marginal farmers

The rapidly rising temperatures due to increased greenhouse gases in the atmosphere has led to climate change, where crops are increasingly facing the threats of extreme heat and pest attacks. Pest attack is one of the major issues that farmers face today; reasons being an increase in the temperature along with high humidity, resistance of pests to pesticides and usage of high yielding variety seeds. As the pest menace in paddy and wheat crops increased, small land holders of Hariharpur Rani Block, Shravasti district continued to use a higher amount of pesticides and fertilizers which led to a surge in the input cost but had too little impact on pest and diseases. This led to crop loss and consequently a reduced production, a matter of grave concern for the farmers. The current scenario of increased humidity and climate change aggravated their misery.

A need of synergizing indigenous knowledge with scientific methods was felt to address this issue. GEAG introduced bio-pesticides and bio-manure to control pest attacks, thereby maintaining the health of crops. *Matka khad* is one of such intervention that contributes towards climate resilient farming. This not only increases the fertility of soil, but also decrease pest attacks and hence, enhances production.



Matka khad preparation process

Season	Quantity	Associated Scientific Knowledge	Steps for preparation of Matka Khad
Cow dung	5 Kg	Helps in maintaining hums and nutrients in <i>khad</i> and improves water holding capacity	Mix all above ingredients in a mud pot and tie its mouth with a cotton cloth
Cow urine	5 Ltr	Contains nitrogen, nutrients, and pest control properties	Keep the pot in a cool and shady place for 21 days
Jaggery powder	150 g	Acts as a starter, as the decomposes bacteria present in <i>khad</i> is sacchorophy in nature. It also enhances the iron nutrients in <i>matka khad</i>	After 21 days bring it out and mix well. For 7 litres of solution, 1 litre of <i>matka khad</i> is required
Egg shell powder	30 Pcs.	Has property to easily dissolve in cow urine and is also absorbed by the plants	1 : 7 ratio is used
Gram Flour	150 g	A protein rich material, if fulfils the nutrient value and provide feed to decomposer	
Water	5 L		

This low-cost manure brings down the production cost and enhances the plant resistance against pest. It is effective in controlling stem borers, *udbadta* and brown spot disease. It also fulfils the nitrogen requirement of the crops.

Comparative cost for 1 acre

Matka Khad	Imida Cloropid pesticides	Urea
15 Litre of matka khad costs Rs. 22 and is mixed with 105 L water to spray on 1 acre of land	100 ML mixed with 100 L is sprayed on 1 acre of land and costs around Rs. 430	50 Kg/ acre urea costs Rs. 400

Bindu Devi adopted *matka khad* instead of other chemicals or fertilizers. She speaks of her experience:

“Earlier I was dependent on chemicals which were very costly and the crop production was also not good. This time I used the matka khad technique for rice and found a remarkable change. After spraying matka khad in 1 acre paddy field at a cost of around Rs 22, the production increased. Now in 1 bali I get 412 rice grains as compared to the past where one bali gave about 370 rice grains. This remarkable change has never happened before.”





CASE STUDY

Portable Solar Irrigation Pump

A cost effective solution for smallholder farmers of Shravasti

Smallholder farmers of Shravasti district are largely dependent on rainfall for agricultural production, making them particularly vulnerable to climate induced water shortages. Irrigation plays a crucial role in providing farmers with resilience to drought and water scarcity, reducing the risk of crop failures, and improving agricultural production. However, it comes with its own limitations, as the price of diesel is increasing, which adds to the burden of high input cost in agriculture for the farmers.

Due to this mounting expense, farmers fail to cultivate vegetables or other cash crops in Rabi and Zaid seasons. A solar irrigation pump emerged as a solution to deal with this compelling issue. GEAG team, supported by HDFC Bank CSR, brought the idea of a portable solar irrigation pump to ensure that technology could be equitably utilized by each farmer.

A total of 6 portable solar irrigation pumps of 400 watt each, with an attached battery back-up of 30 minutes

was set up in the intervention area. This brought an astonishing change in terms of slashing the input cost of irrigation and a rising productivity.

Pumps	Comparative Cost
Solar Irrigation Pump	20 Rs./Hour = 60 Rs./Bigha
Diesel Pump	200 Rs./ hour = 600 Rs./Bigha



land in 6 months and have saved around Rs 1,94,400. A pattern of increase in crop intensity has been observed as farmers have undertaken cultivation of vegetables during Zaid season, that includes vegetables like pumpkin, cucumber, bitter gourd, watermelon etc.

The group of farmers availing solar irrigation services revealed,

“Thanks to the portable solar irrigation system, we are no longer dependent on high-cost diesel motors that compel us to grow limited crops. Moreover, as a collective we can grow crops the whole year round, even during the Zaid season. This has increased the crop yield/year, thus increasing our incomes. It has offered us with a great perspective to adopt sustainable and climate resilient technology that will benefit us and our future generations.”

So far, 148 farmers have availed the benefit of portable solar irrigation pump, irrigating 216 acres of agriculture





CASE STUDY

Agriculture Tool Bank

Pooling resources for sustainability

In the villages of Shravasti district, small and marginal farmers frequently lack agricultural equipment and are typically dependent on large farmers or adjacent markets for the rental of the same throughout the cropping season. The situation is worse for female farmers who lack market access and must rely on others or travel alone to organise the necessary machinery. These situations occasionally can cause delays or failures in the delivery of necessary inputs for crops, which results in crop loss.

In order to address this, a need for a farmer friendly, local, sustainable Agriculture Tool Bank was felt to avoid this inconsistency and lessen the losses, especially for the marginalized groups. This need was developed at the community level; discussions were carried out at the local level with the community members and extension officers, and after this collaborative process a mutual decision to establish an Agriculture Tool Bank at the village level supported by the HDFC Bank CSR HRDP programme was taken.

Agriculture Tool Bank is a self-sustainable model, financed by the income earned through the sale of inputs and rental of farming equipment. It is managed by a person nominated by the village management committee who supervise, monitor and maintain adequate data to meet its compliance requirement for a successful run.

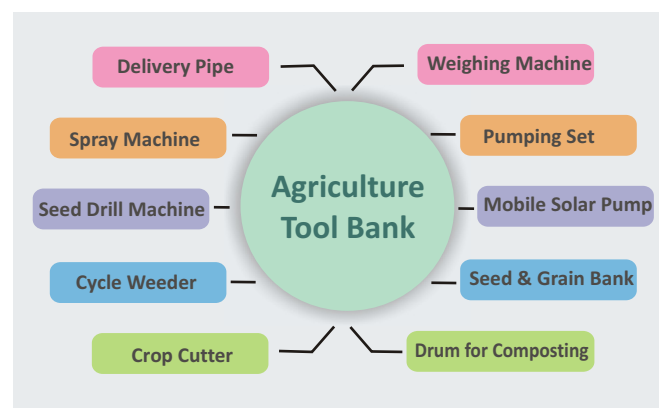
The main functions of the Agriculture Tool Bank are:

- ◆ Timely seasonal need assessments and procurement of inputs.
- ◆ Provision of agriculture related equipment on custom hiring basis, on time and at reasonable rates to small, marginal, and women farmers.
- ◆ Linkages with other villages and block institutions.
- ◆ Provision of a platform for increased accessibility of agricultural equipment for farmers at local level.

The benefits of Agriculture Tool Bank are:

- ◆ Helps marginalized farmers save time, energy.
- ◆ Increases farmer's profitability.

The agricultural equipment available at Agriculture Tool Bank are:



Agriculture Tool Bank Impact Analysis Data from Sept. 2021 to 31st March 2023

S.No.	Agriculture Tool	No. of User Farmer	Covered Area in Acre	Rental Cost	Market Rental cost	Saved Amount in Rs.
1.	Delivery Pipe	854	1265	Rs. 72,135 @ 15/- (100 ft per day)	Rs. 1,20,225 (Rs. 25/- per 100 ft per day)	48,090
2.	Spray Machine Manual	276	453	Rs. 14,040 @30/- per day)	Rs. 23,400 (@50/- per day)	9,360
3.	Battery operated Spray Machine	373	817	Rs. 19,520 (@40/- per day)	Rs. 48800 (@100/- per day)	29,280
4.	Diesel Pumping Set	349	462	Rs. 4,62,875 (@162/- per hour)	Rs. 5,75,000 (@200/- per hour)	1,12,125
5.	Mobile Solar Pump	296	277	Rs. 55,400 (@200/- per acre)	Rs. 2,77,000 (@1000/- per acre)	2,38,500
6.	Seed Drill	125	173	Rs. 1,38,400 (@800/- per acre)	Rs. 1,73,000 (@1000/- per acre) for pump set	36,400
7.	Cycle Weeder	137	12.5	Rs. 1,440 (@20/- per day)	Not available in market	
8.	Hazara	155	18.6	Rs. 1,870 (Rs. 10/- per day)	Rs. 9,350 (50/- Per day)	7,480
9.	Liquid Bio-composting Drum	345	172	Rs. 4816 (Rs. 28/- per acre)	Rs. 17200 (@100 /- per acre)	12,384
10.	Neem Oil	308	165	Rs. 22,275 (@300/- per Lt. x 74.25 Lt.)	Rs. 44,550 (@600 per Litre)	22,275
11.	Neem Cake	75	18	Rs. 36,000 (Rs. 40/- per kg.)	Rs. 45,000 (@50/- kg)	9,000
12.	Wheat Seed	110	35	16,800 (Rs. 40/- per kg.)	Rs. 26,250 (Rs. 50/- per kg.)	9,450
13.	Bio-pest repellent	157	75.8	Rs. 5,306 (@5/- per Ltr.)	Rs.1,06,200 (@100 per Ltr)	1,00,894
	Total Benefits					6,33,438

The Agriculture Tool Bank emerged to be the best model for a bottom-up approach in the intervention villages of Shravasti district.



CASE STUDY

Community Resource Persons

Local flavour empowers the community

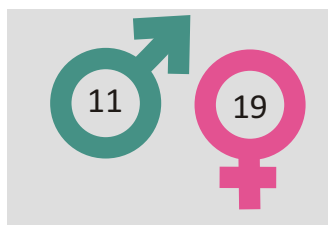
The major challenges for the rural residents of Shravasti are lack of access to resources, education opportunities, financial illiteracy, malnutrition etc. Most of them are small and marginal farmers, unfamiliar with sustainable agriculture practices, which results in high input costs and low output. The government has launched various schemes and programs however these are inaccessible to the community due to the absence of an appropriate channel of communication. These challenges push these farmers toward an impoverished state and inhibit their overall growth.

There was a significant need to provide horizontal extension services to the community for the transfer of knowledge and information to assist them in overcoming these barriers. This emerged in the shape of Community Resource Persons (CRPs) who are the extension agents, native of the village, and involved in the promotion of various beneficial livelihood activities for the welfare of the community. Their involvement bridges the gap between the aspirations

of community members and the notion of the implementer towards a unified conclusion, allowing the community's real problems to be addressed locally. Because CRPs are members of the community, they receive extensive on-ground training and capacity building that they can deliver primary level solutions to the community and assist with continuous on-field support.

30 Community Resource Persons are thriving in Shravasti, through their work of knowledge transfer to self-help groups, or inspiration to save more through improved practices. The women CRPs assist other women in the community to develop their abilities along the entire value chain i.e., in product processing, value addition, and marketing in order to support themselves. Additionally, women CRPs are employed as *krishi sakhis*, who promote the idea of sustainable agriculture. They provide direct field-based examples of their practices and support other women farmers, because they themselves are farmers. CRPs are the community's available human resources 24 hours a day, seven days a week.

Women CRPs are more than just extension agents who, through their efforts, are improving the livelihoods of community members; they have also broken the chains of stereotypes and patriarchal beliefs long held by society by taking a stand, to become socially aware and financially independent. Their individual life story encourages others and gives credibility to the process of development.



No. of male and female CRP in Hariharpur Rani block

Anupama of Gothwa Panchayat, Hariharpur Rani Block, conducts meetings by herself, visits every home in her community, and goes beyond the confines of her residence, to her village, and even the district to participate in awareness campaigns and gatherings. Her husband takes care of their children at home, while she as the sole bread-earner of the family runs the house. Earlier she sat at home, jobless, looking for an opportunity. Today, Anupama is a transformed person, who works effortlessly to revitalise other lives. With her strong will and determination, she has challenged and broken many societal norms to move forward to motivate and create awareness among the community members, particularly the women of the village.

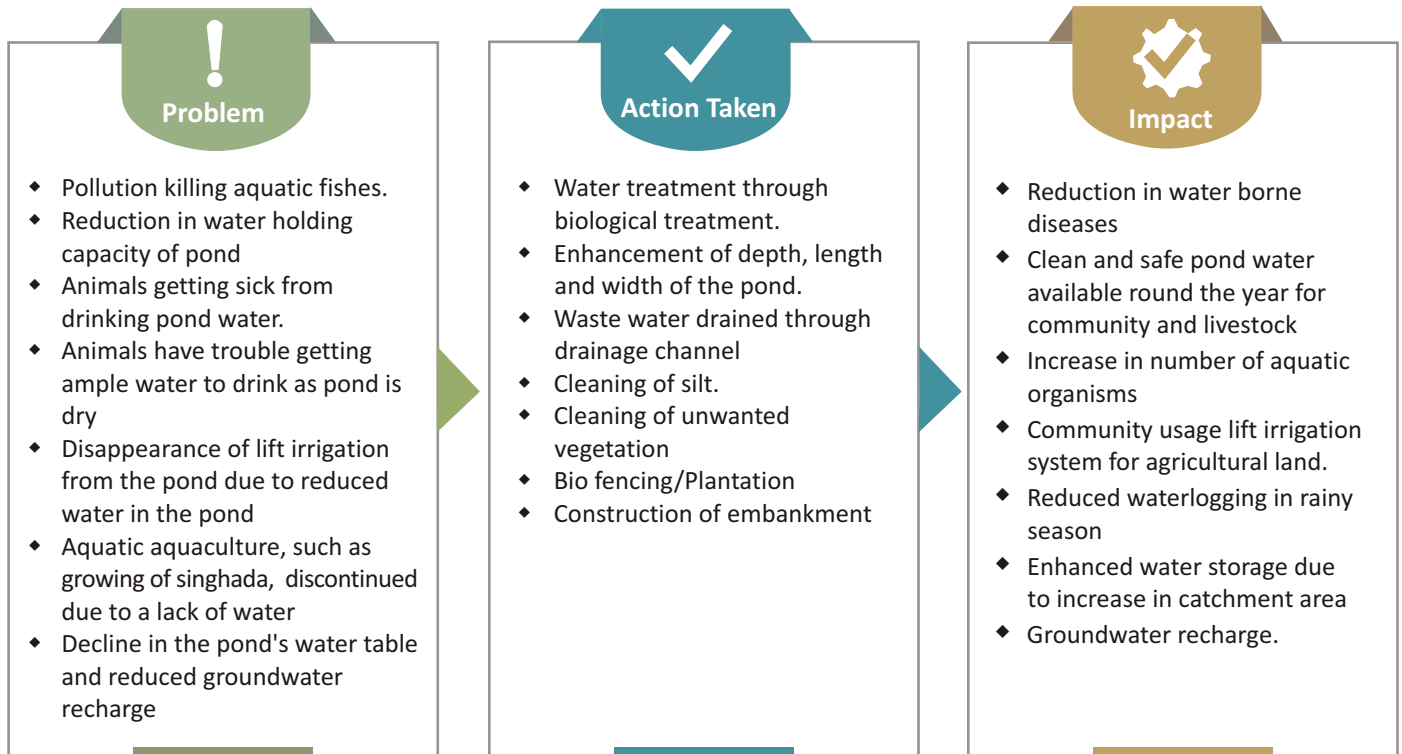


“Mujhe ab gaon ki dusri mahilaen puchti hai ki tumhare jaisa kaam hume bhi dilao, hume bhi kamana hai, ye wahi log hai jo pehle mere kaam ka virodh karte the”

The CRP initiative has enabled a smoother transfer of knowledge by a person who is from the same community, aware of the on-ground situation and hence more credible to the community.



The status of the ponds, before and after renovation is explained in the diagram below:

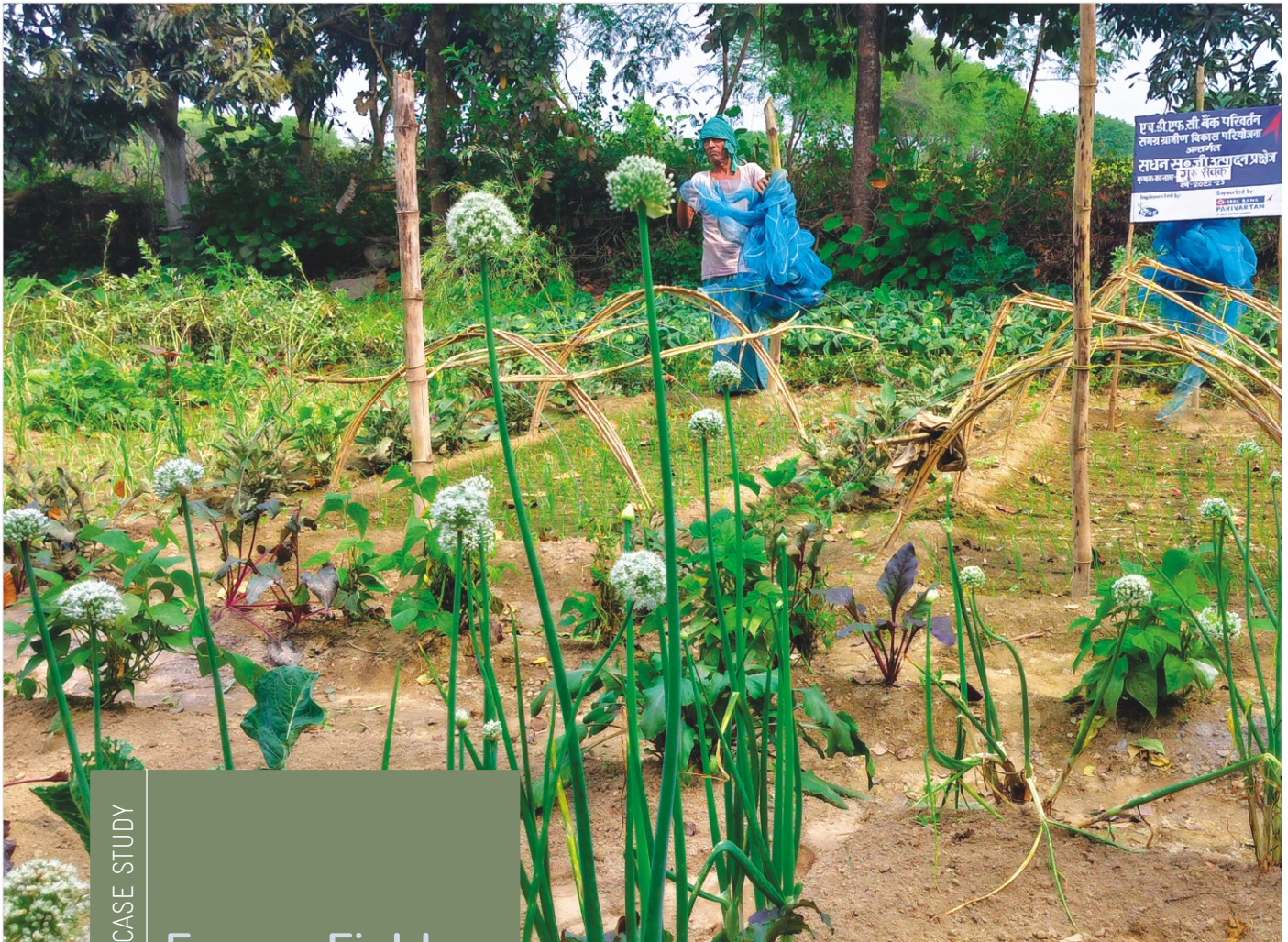


Mayaram says-

“jabse saaf safai ho gayil , macchar kam ho gayil aur kheti me bhi sinchayi ho jayela.”

This is a progressive process that recognises the long-term importance of protecting nature and its direct impact on human lives.





CASE STUDY

Farmer Field School

Knowledge booster for farmers

Shravasti, one of the more backward districts in Uttar Pradesh, has nearly 90% of its inhabitants deriving their income from agricultural activities, of which the marginal farmers (who own less than 1 hectare of land) constitute 80% of the farming population. For these small landholders, the financial burden of chemical inputs such as fertilizers and pesticides, combined with reduced profit margins, pushes them towards acute poverty. Though an effort has been undertaken by the government to provide extension services to the farmers, sadly, this is yet to reach the needy sections in the farming community. As a result, these farmers remain at a disadvantage, unaware of new farming methods, technology, and schemes.

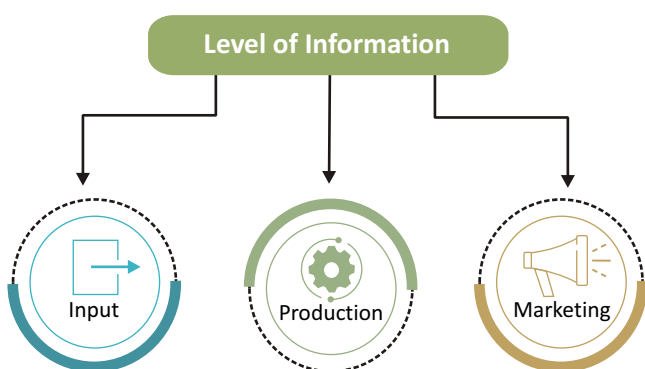
To deal with this, a farmer centric extension mechanism was developed at the village level through Farmer Field Schools (FFS). This is a non-formal farming related educational activity that aims to empower farmers by providing them with practical knowledge, technical learnings and skills to improve their farming methods. In FFS, the farmer's traditional

knowledge is strengthened by blending it with the technical knowledge, in order to promote sustainable agriculture, natural resource management, food security and nutrition, enhanced income and livelihoods. This is a participatory process that focuses on gender equality and social cohesion, and enhances institutional capacity and partnerships.

The objective of FFS is

- ◆ To increase profit through improved yield and reduced input cost.
- ◆ To introduce new and innovative technology concepts among farmers.
- ◆ To enhance knowledge/ capacity of small & marginal farmers

In Shravasti, a total of 8 FFS were established, each consisting of a group of 25-30 farmers. These groups meet twice a month, and are schooled under the guidance of a trained facilitator. Each session is typically held in a farmer's field, allowing for hands-on learning and practical demonstrations.



At the input level, farmers are acquainted on the proper selection of quality seeds and their subsequent treatment. At the production level, they learn to prepare low-cost manure and bio pest repellent using natural ingredients, and IPM & IPNM practices. Finally, at the marketing level, the output is sold through the provision of a convenient platform for the farmers, where they can avail the best price for their produce.

Shravasti lies in a flood prone region, wherein the small landholders are affected to a greater degree. In order to scale down their loss, farming techniques like jute bag farming, multilayer farming system, crop residue mulching etc. are recommended to the farmers. Other technologies such as portable nursery raising, portable backyard gardening, soil solarisation, and time space management in farming are demonstrated to the farmers, and they are

"Mitti Jaach karula se khet aur tet (pocket) dono ka fayada baate."

Hariram, Rehuli, Bisunpur

Operational mechanism of FFS

- ◆ There is no membership fee for these schools, and a bi-monthly meeting is held.
- ◆ Small holders, marginal farmers and women farmers are given priority. Farmers selected and approved by the FFS committee are authorized to run the FFS.
- ◆ To perceive farmers problems, a yellow colour problem card is distributed in the village 15 days before the conducting of FFS.
- ◆ Through discussions of concepts produced by the farmers' shared experiences and practises, an effort is made to find solutions to these problems.
- ◆ Farmers are also taken for exposure visits to progressive farmer fields, KVK, to encourage them to adopt improved practices easily.
- ◆ On this platform, the facilitator farmers provide information at all the levels. This includes preparation of land at the input level and covers production, as well as value addition and sale of the produce.



Coverage and Outcome of FFS

S.No.	Problems	Activities in FFS	No. of Farmers	Area (Acre)	Name of input/ Risk Reduced	Reduced/Saved Quantity	Benefit (Rs.)
1.	Feral cattle grazing pressure and high input costs	Matka Khad	318	52	Urea use	4680 kg @ 6.22	29,109
2.	High input cost in plant protection	Matka Biopest repellent	288	144	Pesticide Rogar, Imida chloropid, fenval dust etc.	2016 kg @ 20	40,320
3.	High fertilizer input cost	Vermi-compost use in vegetable	225	110	Urea, DAP, Zyme	4950kg @6.22, 2750kg@28, 280 kg@35	1,17,589
4.	Nutrient deficiency	Biodynamic compost/ CPP	150	15	Micronutrient (ZN, Boron etc.) & growth Hormone	110 kg @55, Boran 15kg @200, 110kg @ 134	23,790
5.	High plant protection cost	Neem Oil	308	165	Insect attack	165 kg Reagent @ 150	24,750
6.	Soil borne diseases	Neem Cake	75	18	Chemical fertier, pesticides	Urea 810 kg @6.22 DAP 900 kg @28 & Trichoderma 18 kg@210	34,020
7.	Low production	SRI in paddy	103	80	Seed cost, decreased by 3.50 Qt/acre	800 kg@ Rs. 36/-	28,800
8.	High seed Cost	Wheatline Sowing	114	187	Seed cost decreased	1870 kg@40	74,800
9.	High irrigation & labour cost in weed control	Mulching	83	8.3	Weed, labour cost, irrigation	Weed labour cost @1000 per acre, Irrigation cost @800 per acre	14,940
10.	Waterlogging	Jute bag raised farming in water-logged area	59	3.05	Adverse climatic risk reduced	Reduction in seed, fertilizer, Labour, Plant protection & production etc. on in average @50000 per acre	1,52,500
11.	Adverse climatic conditions, small landholding of farmers	Multilayer farming	124	38	Adverse climatic risk reduced	Reduction in cost of Land preparation, fertilizer, Labour plant production etc. & incremental production on an average @80000 per acre	
12.	Soil & Seed borne disease	Soil and seed treatment	318	159	Reduction in soil and fungal diseases		
13.	Barren Soil	Soil health by using Gypsum	64	52	Check on alkalinity in soil	Enhanced paddy production 120kg @ 15	93,600

**"Ye Kisan School se sikh hamar jeevan
ka aadhar ban gayil bhaiya ab."**

Chetram, Kewalpur

encouraged to do so through a learning-by-doing approach. Farmers are also taken for exposure visits to progressive farmer's field and government line departments i.e., Krishi Vigyan Kendra, horticulture departments and agricultural universities to learn more about new techniques and technologies that have evolved in agriculture management.

While FFS has numerous benefits, it also faces several challenges and limitations. One of the main challenges is to ensure that the approach is sustainable over long-term. This requires an on-going support and funding from government/ other organizations. Another challenge is to establish an approach that is inclusive and accessible to all farmers, including women and marginalized groups. This requires both careful planning and adequate implementation to warrant equal access to resources and opportunities for everyone.





CASE STUDY

Harvesting Wealth

The Lucrative potential of summer groundnut

Shravasti is a district in Uttar Pradesh, India, where agriculture is the main source of livelihood for small and marginal farmers. One of the most promising cash crops for these farmers was groundnut which was grown in kharif season, but as the region suffers extreme temperature events and erratic rainfall patterns, these weather conditions often lead to floods and waterlogging throughout the district. The condition worsens due to unplanned, haphazard constructions that lead to waterlogging for several months.

Due to these reasons small and marginal farmers of Shravasti shifted to rice and wheat, resulting in an almost disappearance of the groundnut crop. An initiative was taken by GEAG to revive the cultivation of groundnut in summer season rather than in kharif season. Summer groundnut is a variety cultivated during the summer season, from March to June. It has several benefits for Shravasti's small and marginal

farmers to grow in *zaid* season. Firstly, it requires less water than other summer crops like rice and sugarcane, making it more drought-resistant, which suits Shravasti climatic conditions. Secondly, it has a short maturity period of around 90-100 days, which means farmers can harvest and sell their crops before the monsoon season begins. Finally, groundnut has a high market demand as it is a cash crop and fetches a

good price, providing a steady source of income to farmers.

GEAG provided certified groundnut seeds of variety DH 86 to farmers to ensure that they have access to high-quality inputs which can improve their yields.

Farmers who adopted summer groundnut reported higher yields and incomes which have improved their standard of living. They have also become more resilient to drought and other climate-related challenges. Moreover, these initiatives have empowered farmers by giving them more control over their crops and land, with higher sale incentives.

"Garmi ke moongfali boala se paidawar aur nakdi adhik milat hai."

- Brijmohan, Mohammadpur Kala

Summer Groundnut as incremental crop for recovery of flood losses	Benefits
The No. of groundnut growers has increased by 30 farmers	Enhanced food security
The production area has grown by 2.40 acre	Increase in income

In conclusion, summer groundnut is an incremental cash crop with great potential for small and marginal farmers in Shravasti. Despite the challenges they face, initiatives to promote this crop had a positive impact on their livelihoods and resilience. With continued support from government agencies and organizations, more farmers can adopt this crop and reap its benefits. By promoting sustainable agriculture practices and empowering farmers, we can shape a more equitable and prosperous future for rural communities.





CASE STUDY

Millet Farming

A Climate Smart Crop to Empower Farmers

In the monsoon season (June to September), flooding is a routine concern in Shravasti district as it damages crops, upsets human lives, affects property, and influences livelihood of community. Climate change has increased the rainfall variability which tends to destroy crops, especially kharif crops due to which small and marginal farmers face major losses. After observing the current situation and past experiences, GEAG team identified 72 progressive farmers from the intervention villages of Akbarpur, Hallajot, Keshwapur, Gorpurwa, Kevalpur, Banskuri, Sivajot, Kharch, Rehli Visunpur, Jaugarh, Gajovari, and Bairagijot and encouraged them to cultivate millets in their farms.

Millet farming, originally common in the area, has virtually vanished today. Millets have a stronger ability to tolerate severe, uncertain, and adverse climatic conditions, as well as floods and short-term

droughts. These crops have a higher nutritional value, which places them in high demand and more profitable.

Nutrient content of millets (per 100 grams)

Crop/Nutrient	Protein	Fibre (g)	Mineral (g)	Iron (mg)	Calcium (mg)
Pearl Millet	10.6	1.3	2.3	16.9	38
Finger Millet	7.3	3.6	2.7	3.9	344
Foxtail Millet	12.3	8.0	3.3	2.8	31
Proso Millet	12.5	2.2	1.9	0.8	14
Kodo Millet	8.3	9	2.6	0.5	27
Little Millet	7.7	7.6	1.5	9.3	17
Barnyard Millets	11.2	10.1	4.4	15.2	11
Rice	6.8	0.2	0.6	0.7	10
Wheat	11.8	1.2	1.2	5.3	41

Source: Millets Future of Food and Farming, Millet Network in Indian, Deccan Development Society, FINA, India

Farmers in the HRDP intervention block cultivated millets on 14.5 acres of land and harvested around 56.5 quintals of product, the majority of which was stored for the next season. 12 farmers successfully sold their millets, earning an additional Rs. 1, 05,720

from 6 acres of land. Farmers reported exceptionally high millet yields even in waterlogged or drought circumstances, resulting in higher profitability as well as an enhanced food security for them, and fodder, and other by-products for their home use.





CASE STUDY

Overcoming the impact of flood

Empowering
Communities with
Water and Sanitation
Strategy

Shravasti district is amongst one of the most backward districts of Uttar Pradesh. It lies in Terai region, and is marked by extreme temperature events and erratic rains causing floods and waterlogging across the district. Climate change is further exacerbating the vulnerabilities of marginalised communities living in these difficult areas.

GEAG staff played a crucial role in preparing communities to become flood resilient. These include teaching people to create an emergency kit with essentials such as food, water, and first aid supplies. They helped communities develop evacuation plans and identify safe places; and worked to ensure that people have access to clean drinking water and proper sanitation facilities during floods.

Pre-Flood

Floods can cause significant damage to a community's infrastructure, including its water and sanitation systems. It is crucial for communities to have a plan in place to ensure that they are prepared in advance, as flood waters can contaminate water sources, damage infrastructure, and disrupt sanitation services. Communities are asked to conduct risk assessments to

identify vulnerable areas and prioritize actions to reduce the impact of floods on water and sanitation systems.

During Flood

Communities are prepared to have emergency water supplies in place, such as water tanks to ensure access to safe drinking water during and after a flood event. Sanitation systems are at risk during floods since, for during this period they do not function well, which may result in the spread of diseases. Communities are asked to ensure that their sewage treatment plants and sewer pipes are protected from floodwaters during the training process. Furthermore, during and after a flood occurrence, communities are encouraged to have strategies in place for the correct disposal of trash, including human waste.

Another major concern during a flood is the potential for sewage backups and contamination of water sources. Communities should have a plan in place to ensure that their sanitation systems are operational and safe. This includes proper checking and regular maintenance of sewage systems, and sensitization on how to properly dispose of waste during floods. In times of a crisis, effective communication is crucial. Local officials must create open channels of communication with the community and provide frequent updates on the latest situation.

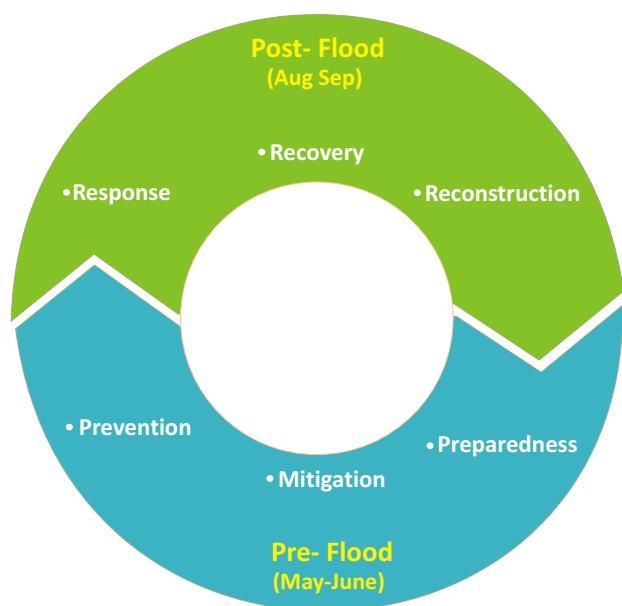


Post Flood

The community were told to be aware of the risks and take adequate precautions, such as boiling water before use or using RO water until the water is fit for drinking. Floods can also cause sanitation issues such as overflowing septic systems and damaged sewage treatment plants which can lead to the spread of disease and illness. In such a case, community members must collaborate with the local government and organizations to develop a comprehensive plan for recovery and rebuilding systems that prioritize public health and safety. This includes collaborating on emergency response plans, sharing information on available resources, and coordinating efforts to aid affected areas.

After the floods, it is also important for communities to come together to recover and rebuild. Repairing damaged infrastructure, restoring access to clean water and sanitation facilities, and addressing any lingering health concerns are some its important highlights.

Flood preparedness and flood safety measures





CASE STUDY

Smart School

Crafting technology through an integrative environment for a brighter tomorrow

Government schools are responsible for educating a large proportion of the population, particularly those from disadvantaged backgrounds. By implementing smart school concepts, they can not only improve the quality of education they provide, but also contribute to the development of the wider community. This vision was accomplished through a partnership model between the government and GEAG, supported by HDFC HRDP programme in 8 government schools of Shravasti..

The main objective of the programme is to make education accessible to each and every child; and smart schools make learning fun and interactive for children. Here, learning technology, such as computers, library, laboratory, and audio/visual setup, is integrated into classrooms to enhance opportunities for both teaching and learning. Additionally, Smart Schools ensure better facilities, greater parental and community involvement, and improved instructional methods. It also aims to reduce the inequality

between public and private educational systems by providing infrastructure resources to government schools in order to promote a favourable learning environment for all children.

The HRDP program assists the government schools through following ways:

1. Reconstruction of the government building
2. Provision of furniture for classrooms
3. Construction/ repairs of compound walls

4. Setting up and equipping science laboratories and libraries
5. Drinking water facilities/ water purifiers
6. Toilet renovation/ construction
7. Establish kitchen gardens for fresh vegetables in mid-day meals.
8. Promote healthy sanitation practises and preventative care, health and hygiene education sessions with children and teenagers.
9. Ensure parents of all students attend regular PTA meetings to discuss the development and maintenance of the school.

In the Upper Primary schools of Gajovari & Akhbarpur, a kitchen garden has been built on 2 *biswas* land inside the school. Its caretaker are the school children, who are divided in groups for each day in the week to water the plants, control weeds and add organic manure to nurture the plants. As a part of their subject curriculum, there is a hand on learning session through the practical experience of gardening that they carry out in the school.

Kitchen gardening is an important activity to engage children to learn more deeply about science and nature, while teaching them key life skills, that further shape their positive behaviour and development. It additionally helps

- ◆ Foster team spirit and companionship.
- ◆ Encourage healthy and nutrition rich eating.
- ◆ Shape a positive, hard-working attitude.
- ◆ Build affinity for the planet and their natural environment.
- ◆ Promote values like love, compassion, sharing, harmony, and responsibility.

Children's midday meals are supplemented with nutrient-rich spinach, lemon, coriander, radish, gooseberry, tomato, onion, ginger, beans, and bottle gourd to meet their daily nutritional needs.

Science laboratories have been established in the upper primary school of Kewalpur and Gorpudwa to offer a hands-on experience to learn and experiment for the students, and encourage them towards a deeper understanding of scientific aspects. The laboratory was established at a cost of Rs 4 lakhs and

30% of dropout female students are returning to school.

“Hume school me padhna accha lagta hai jabse yaha paudhe lage main inka khayal rakhta hoon, masterji bhi paudhon aur sabjiyon ke fayde ke baare me batate hai. Is wajah se main inka aur khayal rakta hoon”

- Amarjeet, class 4th Gajovari



In Kewalpur the percentage of new student has risen to 40%.

offers a variety of equipment to understand the theoretical part in an experimental manner. Following are some of the equipment in the laboratory:

- ◆ Forceps
- ◆ Test tubes
- ◆ Conical flasks
- ◆ Microscopes
- ◆ Vernier callipers
- ◆ Chemicals
- ◆ Burettes etc.

In Hallajot, a **library** has been set up to inculcate reading habits among children from an early age. Through an activity corner, the children are given materials and encouraged to use their creativity to develop models and products from waste materials or natural resources. These efforts were well received and appreciated by school authorities, as well as the students.

In conclusion, the implementation of smart school concepts in government schools is essential for ensuring that students receive a high-quality education that prepares them for the challenges of the future.



CASE STUDY

Vending Cart

Unemployed youth turn entrepreneurs, enhance livelihood

For landless farmers and the unemployed youth of rural Shravasti, life has been extremely challenging, making it difficult to survive. Due to economic hardship, lack of education or training, geographical constraints, and scarce job opportunities the community members especially youth struggle to make ends meet. For them, it is extremely hard to find a reliable source of income. In such circumstances, the youth are forced to migrate to big cities for livelihood and live in adverse conditions. An instant solution is to provide them with opportunities in their own areas, and tap their potential to earn a livelihood locally. Keeping this in mind, an entrepreneurship model emerged in the form of providing them with vending carts.

These carts are seen as a fruitful model for landless and unemployed youth to earn a living, and can be used to sell a variety of goods, including food, drinks, and household items. With low start-up costs and the ability to move around to different locations, vending carts offer a flexible and sustainable source of income for the unemployed rural youth. Additionally, by offering goods and services that might not otherwise

be accessible in rural areas, vending carts help boost regional economies.

Gopal, belongs to village Mohammadpur Kala of Hariharpur Rani Block in Shravasti district of Uttar Pradesh. He owns no land, and works as an agricultural labourer in fields belonging to landed farmers. Sometimes he is paid Rs 150 for a hard day's



work, or else in kind with a few kilograms of wheat, rice or even vegetables for his arduous work in the farm the whole day. Earnings are not enough to sustain his family of four that includes his wife and parents. They manage a meagre meal of *dal* and rice twice a day, but there is never sufficient food for all of them. He also worked as a waiter in a marriage house in Bahraich at Rs. 300/day, but the work is seasonal, and is incapable to run his household in the long run. Being landless in a rural set up, with limited opportunities of work and the pressure of his family's sustenance was pushing him towards depression.

At the same time, GEAG initiated a vending cart support for landless and unemployed youth with the

financial assistance of HDFC Bank CSR HRDP programme. The community contemplated and decided that Gopal is a hardworking person and deserves a vending cart to aid his earning. Gopal was quick to grab this opportunity, and utilised his skills to launch a mobile food cart. He borrowed Rs 7,000 from his relatives to buy the products needed for food preparation, and soon started selling snacks and food items on his cart, travelling to 3 villages every single day. Within a month, he was able to repay the debt to his relatives. His profit stands at Rs 600/day which earns him a satisfying Rs18, 000/month. This income helps him live a stress-free life, and become a confident individual. Today, he feels great pride in his work, as he carefully selects and prepares food items to ensure a high standard, as well as build up a greater customer satisfaction.

Gopal says-

“Hum to bahar kamat rehni corona me bhojan ke vyavastha bhi naahi hot pawat rehal ab lagbhag 600-700 kama le tani, ee tehlahwa ghar pariwar ke roji roti ke saadhan ban gayil baa.”

List of beneficiaries showing comparative income of pre and post vending cart support

S. No.	Beneficiary Name	Village	Name Vending Cart	Per month average income post vending cart	Per month average income pre vending cart	Increase in income per month in Rs.
1.	Mr. Gopal	Mohammadpur Kala	Fast Food mobile shop	18,000	7,500	13,500
2.	Mr. Raj Kumar	Kishunpur Chorwa Bhari	Vegetable shop	10,500	6,000	4,500
3.	Mr. Pawan Kumar	Kharch	Vegetable shop	12,000	7,500	4,500
4.	Moh. Israil	Hallajot	Vegetable shop	10,500	4,500	6,000
5.	Mr. Nanhu Ram	Baskudi	Fast Food Mobile shop	10,800	6,500	4,300
6.	Mr. Suraj	Rehli Visunpur	Fast Food Mobile shop	9,750	6,000	3,750
7.	Mr. Prem Kumar	Gajobari	Vegetable Cart	10,500	5,000	5,500
8.	Ms. Shakuntala	Keshwapur	Mobile General Store	12,500	3,000	9,000
9.	Ms. Najima	Jaugadh	Fast Food & Egg Shop	12,000	3,000	9,000
10.	Mr. Vakil Prasad	Kewalpur	Mobile vegetable shop	18,000	6,000	12,000
11.	Mr. Gafur Ali	Akbarpur	Mobile Readymade Cloth	21,000	9,000	12,000
12.	Mr. Sunil Kumar	Bairagijot	Fast Food	14,600	8,000	6,600
13.	Fatima	Godpurwa	Cosmetic	7,500	0	7,500
14.	Lavkush Yadav	Gothwa	Mobile General Store	9,750	3,500	6,250
15.	Khushnuma	Shivajot	Vegetable	13,500	3,000	10,500

Currently, 15 vendors supported by HDFC Bank- Parivartan earn their livelihood through vending carts and are passionately working hard, determined to achieve their goals aided by the right support and resources. Vending carts may appear to be a modest tool to fight unemployment, yet it can have a significant impact on people's lives and livelihoods.

Gorakhpur Environmental Action Group (GEAG) is a voluntary organization working in the field of environment and sustainable development since 1975. Ever since its inception, GEAG has been actively engaged in implementing several development projects addressing livelihood issues of small and marginal farmers, particularly women, based on ecological principles and gender sensitive participatory approach. Besides this, GEAG has accomplished several appraisals, studies, researches at the micro and macro levels as well as successfully conducted a number of capacity building programmes for various stakeholders including women farmers, civil societies groups and government officials etc.

GEAG has established its identity in North India as a leading resource institution on sustainable agriculture, participatory approaches, methodologies and gender. Acknowledging its achievements, GEAG was awarded with the Lighthouse Activity Award by UNFCCC in 2013. GEAG also holds the Observer status to Green Climate Fund.



Gorakhpur Environmental Action Group

HIG 1/4, Siddharthpuram, Taramandal Raod
Gorakhpur- 273016 (U.P.) INDIA
Phone # 0551 2230004, Fax # 0551 2230005
Email : geagindia@gmail.com, Website : www.geagindia.org

