Cluster Interventions Progress Report - 2023

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Local support – Surabhi Foundations, Krishnayan Gowshala, Panchayti Raj Institutions

Govt. Organizations – District Administrations, Horticulture department, Cooperative department, Food processing department, KVK Haridwar

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Gaindikhata Cluster Interventions Progress Report

Unnat Bharat Abhiyan

Name of the interventions

- Mushroom cultivation
- Lemongrass cultivation and oil extraction
- Smokeless cook stove/ Kitchen
- Organic cultivation

Introduction –

In 2017, IIT Delhi identified five villages of Gaindikhata cluster - Gaindikhata, Naurangabad, Laharpur, Pilli Padao, and Laldhang in Haridwar district of Uttarakhand for participation in development work under Unnat Bharat Abhiyan, an important programe of the Ministry of Education, Government of India. Work has begun in collaboration with the Surabhi Foundation. Initially, a group of IIT Delhi students led by Professor Vivek Kumar visited these villages and met with the villagers to discuss the work that would be done to develop the villages through the Unnat Bharat Abhiyan.
Unnat Bharat Abhiyan participants participated in rural observation to understand the available resources and basic problems in these villages through Participatory rural appraisal exercise - family surveys, village surveys, group meetings, social maps, resource maps, and resources and problems with the help of these marked five villages.

The following are some of the major resources and issues identified:

Available resources: Significant employment opportunities are agriculture and animal husbandry. As they are located in the Chidayapur Range of Rajaji National Park, all five villages are surrounded by forests. Sand mining in the Revasan River, which flows through these villages, provides employment for three months out of the year for landless families.

- *Fundamental problems:* After the Kharif crop, the farmers who were working in agriculture had no more sources of income. Smoke-borne infections are spread by using wood as fuel. The crops and vegetables cultivated in the fields are eaten and destroyed by animals including elephants, monkeys, nilgais, and wild boars. Increasing usage of chemical fertilizers and pesticides has raised the cost of agriculture. Since there are no higher education institutes in Gandikhata cluster, one must goto Haridwar to continue their education after Inter, and the majority of girls and children from low-income families drop out after Inter.
- *Work Ethic:* After studying the above resources and problems, IIT Delhi's Center for Rural Development and Technology started working by preparing an integrated plan for the development of these villages, in which promotion of mushroom cultivation, use of smokeless chulha, cultivation of lemongrass Promotion of farming, organic farming, special classes and dialogues for students in schools have been major tasks.
- *Project Financing:* The above schemes' proposals were sent to ONGC New Delhi for financial cooperation, which ONGC New Delhi accepted and made available under Corporate Social Responsibility (CSR) in the year 2019, after which the above schemes were implemented in these villages. Work on the schemes has begun, and the results have been very positive.
- *Collaboration with various departments to achieve convergence:* The Unnat Bharat Abhiyan team began working with different departments like Food & Processing Department, Horticulture Department and Cooperative Department with the help of the District Chief Development Officer, Haridwar, in selected villages, to implement the government's schemes, Krishi Vikas Kendra Haridwar, Education Department, Gram Panchayat, Krishnayan “Gaushala”, and some more local institutions join their hands for development of this cluster.

1) Mushroom Cultivation

Introduction:

Mushrooms belong to a separate group of organisms called Fungi. They lack the green matter (chlorophyll) present in plants and grow on dead and decaying organic materials. From these decaying substrates, they absorb their nutrition with the help ofvery fine thread like structures (mycelium) which penetrate into the substratum and are generally not visible on the surface. After the mycelium has grown profusely and absorbed sufficient food materials, it forms the reproductive structure which generallycomes out of the substrate and forms fruiting body, commonly known as mushroom. The mushroom fruiting body may be umbrella like or of various other shapes, size and color. Commonly, it consists of a cap or piles and a stalk or stipe but others may have additional structures like a veil or annulus, a cup or volva, performing various functionsin the life-cycle of the fungus.

About Intervention –

Six farmer families were involved in this work, which was done in collaboration with the Unnat Bharat Abhiyan. The training was given in convergence with Department of food processing, Uttrakhand July 2019. After receiving training , these farmers prepared a room in their home for mushroom production by cleaning it and making it suitable. With assistance from ONGC CSR, they were given mushroom compost, button mushroom spawn, plastic bags, and other

supplies. For the first time in their lives, these farmers very easily farmed mushrooms. In addition to farming, nutritious mushrooms were also put on their plates for the first time. In fact, these farmers' homes were filled with joy for the entire three months. Because his house was making between 100 and 200 rupees per day selling mushrooms. All of the customers who purchased mushrooms came from their village or the surrounding area.

The button and oyster mushrooms were the first two that the locals began to work on. Despite the COVID pandemic, farmers began growing oyster mushrooms because of the successful production and sale of button mushrooms. Unnat Bharat Abhiyan, with the assistance of ONGC CSR, New Delhi, gave oyster mushroom spawn and plastic bagsto five interested farmers from Dehradun. Farmers successfully produced and sold oyster mushroom compost by using wheat straw that was already in their homes and purchasing the essential medications and chemicals from Haridwar “Krishi Mandi”. In 2020, eight new families began mushroom farming inspired by the popularity of oyster and button mushrooms. At the time of the COVID pandemic, two local farmers built two largemushroom farm buildings at Laldhang and Pilli Padao, with a daily production capacity of 1200–1500 kg of mushrooms. At Pilli Padao, a -new mushroom production facility is being built.

Why this intervention –

The intervention's main goal is to provide villagers with a steady source of income. Both men and women will be employed and paid directly to the customer, eliminating

the need for a middleman, i.e. farm to consumer. They were then given mushroom compost, button mushroom spawn, plastic bags, and other supplies with the help of ONGC CSR. Six farmer families were initially involved in this work, which was carriedout in collaboration with the Unnat Bharat Abhiyan. In July 2019, the training was delivered directly in collaboration with the Uttarakhand Department of Horticulture and Information. Repeating sentence kindly check above page, already written

Impact of Mushroom Cultivation:

The attraction of local farmers is increasing in mushroom cultivation, new farmers are also starting to cultivate mushrooms on a small scale, the team of Unnat Bharat Abhiyan and Surabhi Foundation is providing mushroom training and production to the Chief Development Officer of Haridwar district and Block Development Officer of Bahadrabad through Unnat Bharat Abhiyan. Information related to farming has been conveyed from time to time in his office, the benefit of this is that the Uttarakhand state government has selected Haridwar district for mushroom under the One District One Product (ODOP) in coordination with the District Administration.

Current Status of cultivators –

Two businesspeople constructed mushroom factories in two different Gaindikhata cluster villages after realizing the potential of the mushrooms. Those who cultivated mushrooms at their homes in the past used to sell them for 150/- to 200/-. However, the factory's machinery allows for speedy and mass production, which drives up the price of the mushroom to 100/- per kg. Currently, the villagers are stopping what they are doing to go to the factory. Additionally, there is another factory project underway in the cluster.

2) Lemongrass Cultivation and Oil Extraction

Introduction:

In this cluster agriculture and allied activities (Dairy) are back bone of economics but same time forest animal is big enemy for their agriculture. One family member has to take care their cultivated land from forest animal especially from monkey and elephant. So we have introduced Lemon grass cultivation which has no threat from animals even it can be cultivated in the land which is far away from their home where without take care lemon grass cultivation has no threat from forest animal.

Aromatic plants synthesis and preserves a variety of biochemical products, many which are extractable and useful as chemical feed stocks or as a raw material for various perfumery, flavoring and pharmaceutical industries. Aromatic plants contains odor volatile substances in form of essential oils which constitute the essence or active constituent of plants.

Lemongrass (*cymbopogonflexuosus*) grows well in both tropical and subtropical climates. However, ideal conditions for growing lemon grass are warm and humid climate with sufficient sunshine and evenly distributed over most part of the year. Lemon grass can also be grown in semi-arid regions receiving low to moderate rainfall. It can grow well over medium fertile soils and moderate irrigation. Well drained sandy loam is most suitable for the growth of the plant.

It requires very little care and maintenance. It can be grown as rain fed crop. It is a perennial crop. The life span of the grass is 8 years i.e. once planted it could go on yielding herb for 8 years giving scope for at least 3 to 4 cuttings per annum. It is also considered as non-browsing crop. As a result, it would prevent soil erosion and can control landslides to certain extent.

Lemongrass is an herb and is well known and utilized for its distinct lemon flavor and

citrusy aroma. It is a tall, perennial grass which is native to India and tropical regions of Asia. It is a coarse and tufted plant with linear leaves that grows in thick bunches, emerging from a strong base and standing for about 3 meters in height with a meter-wide stretch. In addition to its culinary usage, lemongrass offers a wide array of medicinal benefits and is in extensive demand due to its antibacterial, anti-fungal and antimicrobial properties.

About Intervention –

The lemon grass is easy to grow with less risk, less investment and assured marketing and income. Cultivation cost is very less compare with paddy or Ravi, Once Lemon grass sapling is transplanted in field continuously five years grass can be taken after four months interval. Although more profit can be gain if mix cropping is promoted so first year we have try to crop lemon grass sapling with Urad dal (Pulse) so that farmers will have dual benefit.

Average return of lemon grass in a year

Krishna varieties in (.1 acre of land) -	7500
Subtract total cost price – 7000 Rs. for a year	6000
(This cost price is for 1st year)	----------
Net profit	1500

(N.B. - Sapling has been given to farmers by IITD so sapling cost may be added on Farmers net profit 1500 + 4000 = 5500 Rs. From 2nd yr. cost price will reduce by Rs. 450.

Why this intervention –

The intervention's main goal is to give a ray of hope to reduce their losses. As many wild animals – such as elephants, monkeys, wild boars, jackals, nilgais & leopards enter the villages in quest of food from the nearby located Rajaji National Park and forests which encircle all of these settlements in the clusters. Due to these type of destroys to the crops, farmers were losing interest in growing crops until they have a separate manpower to guard their crops.

Impact of lemon grass cultivation – There are twenty farmers who are cultivating lemon grass

in this cluster on 20 acre of land area. Two lemon grass oil extraction machines have been installed one at Pilli Padao and 2nd at Shyampur. Almost in every village of this cluster farmers have become aware about lemongrass intervention. State government cooperative department are giving handholding support to the farmers.

Total average production
Of Rice (.1 hectare) 6 quintal. So average rice price is Rs. 15 per Kg.
600x15 = 9000

Calculation of Wheat in (.2 Hectare)
Total average production of wheat (.1 hectare) 3.5 quintal
Average price is Rs. 17 per Kg. 350x17 = 5950

Gross earning	14950
Subtract total average cost on production -	7000
Net profit in Rs.	7950

Source – Discussion with farmers

N.B. - Above all calculation has been done if all circumstances in favor of farmers. As we know that this cluster is surrounded by Raja G National park so forest animal always eat and damage their crop in this condition there is no fit calculation how much they can get return from agriculture. In this condition lemon grass has a good option for them. As we know that no animals eat/destroy lemon grass crop.

Current Status –

There are 20 farmers who are cultivating lemon grass in this cluster. Six of them are able to run this oil extraction machine. This year 400 hundred litres of oil have been produced and sale (Price range Rs.-1400 to 1200 per liter)



Lemon grass in different villages and center image is of oil extractor machine (Lemon grass)

3) Smokeless Cook stove/ Kitchen

Introduction:

To increasing awareness of the harmful effect of fossil fuels on environment & consequently quality of life of people, both government & household are looking ensuring availability of reliable clean energy. Although people are not ready to accept at the cost of health, environment & natural resources. In India about 25 millionrural households approx. 1104 TWh of energy is used for domestic cooking.

In the adopted villages, the most common and easily available fuel is wood for making food. Kitchen smoke is mostly effected to females and kids as Females generally cook food in rural area so they have to stay in the kitchen surrounding till the food is prepared and children were also mostly stayed in the houses near their mothers.

The cost of each stove made available in five villages by showcasing the TEG cook stove developed at the Centre for Rural Development and Technology (CRDT) at IIT Delhi was Rs. 5800/- for which the villagers didn't have to pay any price, They received from ONGC CSR fund. After that, ten more stoves were provided to them on the demand of the villagers, for which they have given a support amount of Rs 1000. A group of users of smokeless TEG cook stoves were formed to create awareness work for smokeless kitchens and a joint savings account has been opened for two of their members in the local bank in the name of this group. Shortly thereafter, students of TISS Tuljapur came to study the Gaindikhata, cluster in which it was concluded that the villagers are

unable to repair the TEG cook stove when it is damaged, and they are not suitable for preparing food for 4-5 people.

About Intervention –

Smokeless stove (based on thermal electric generate TEG technology, total cost per stove Rs. 5800/-) manufactured by Center for Rural Development and Technology, IIT Delhi was demonstrated in Gaindikhata cluster in July 2019. The chulha on display were distributed among poor families who used wood as fuel for cooking. After one week, twelve new families expressed their desire to take smokeless stoves, which weremade available for a contribution amount of Rs.1000/- only. Looking at the demand of all these village families, improving the quality of smokeless stove, reducing the cost (based on solar plate, the total cost per stove is Rs. 2700/-) provided smokeless stove to six new families. Has gone. More than fifty families of these villages have expressed their desire to have smokeless stoves.

Why this intervention –

- It consumes 40-50% less fuel compared to its traditional counterpart. Thus it saves labor, money, as well environment.
- It is engineered to focus the heat on the utensils and hence cooking is faster and optimal burning prevents blackening of them, which is again time saving during cleaning.
- It also allows simultaneous cooking of two dishes; hence the overall time spent on cooking is saved which can be used for constructive purposes.

- Exhumes get expelled through the vent hence the smoke doesn't accumulated inside the house which saves the women and the children from indoor pollution and associated infections.
- Making a smokeless chulha is fairly simple and can be undertaken by rural household with minimum effort.

Current Status –

Awarness about use of smokless energy for cooking purpose have increased in this cluster, many individuals have built chimneys within their homes in order to prevent the smoke from being a major problem.

4) Organic Cultivation

Introduction:

Organic farming is being promoted to reduce the cost price of farmers in agricultural work and to make better use of cow dung available in villages. For this work, many awareness meeting and capacity building training program me have been done in Gandikhata. The local Krishnayan Gowshala is supporting farmers to provide organic fertilizers and manure, project, at present, organic farming farmers are adopting organic farming in almost all the villages of the cluster. Farmers who can join organic farming gradually reduce the use of chemical food and pesticides in the beginning, increase the use of earthworm food, bio gas slurry, dry dung, by doing this, they are moving towards

Completely organic. Organic pesticides, earthworm food and bio-gas slurry are available locally from Krishnayan Gowshala, an agency associated with “Namami Gange Mission”. Considering the benefits of organic farming, 45 farmers have adopted practice of organic cultivation in the entire cluster. The Model Organic Farming Complex is also operated at Krishnayan Gowshala in Pilli Padao, where the farmers of the cluster can learn from the center more about the organic farming.

About Intervention –

Organic agriculture grows and develops with these principles. These can contribute to improving organic agriculture for the world.
There are four principles of organic farming are as follow:-

Principles of Health – The health of the ecosystem, people, and communities.
The Principles of Ecology – The right balance between ecosystem and environment or nature.
Principles of Fairness – Good human relationships and quality of life.
Principles of Care – The considerations about the environment and environment of the future.

Why this intervention –

The goal of organic agriculture is to contribute to the enhancement of sustainability. In the context of agriculture, sustainability refers to the successful management of agricultural resources to satisfy human needs while at the same time maintaining or enhancing the quality of the environment and conserving natural resources for future

generations. Sustainability in organic farming must therefore be seen in a holistic sense, which includes ecological, economic and social aspects.

Benefits of organic agriculture are-

- Improving soil structure and fertility through the use of crop rotations, organic manure, mulches and the use of fodder legumes for adding nitrogen to the soil fertility cycle.
- Prevention of soil erosion and compaction by protecting the soil planting mixed and relay crops.
- Promotion of biological diversity through the use of natural pest controls (e.g. biological control, plants with pest control properties) rather than synthetic pesticides which, when misused, are known to kill beneficial organisms (e.g. natural parasites of pests, bees, earthworms), cause pest resistance, and often pollute water and land.
- Performing crop rotations, which encourage a diversity of food crops, fodder and under-utilized plants; this, in addition to improving overall farm production and fertility, may assist the on farm conservation of plant genetic resources.
- Recycling the nutrients by using crop residues (straws, stovers and other non-edible parts) either directly as compost and mulch or through livestock as farmyard manure.
- Using renewable energies, by integration of livestock, tree crops and on farm forestry into the system. This adds income through organic meat, eggs and dairy products, as well as draught animal power. Tree crops and on-farm forestry integrated into the system provide food, income, fuel and wood.

Impact of Organic farming –

Organic farming minimizes the use of pesticides and chemicals thereby reducing the major environmental issues. It ensures the health of soil, water, air and flora and fauna. Also reduces the major environmental issues like soil erosion, air pollution, water pollution etc.

Current Status of cultivators -

More than 120 farmers have started organic farming in Gaindikhata cluster, the awareness of organic farming is spread. Farmers are also getting many benefits from it such as-

- Economical: In organic farming, no expensive fertilizers, pesticides, or HYV seeds are required for the plantation of crops. Therefore, there is no extra expense.
- Good return on Investment: With the usage of cheaper and local inputs, a farmer can make a good return on investment.
- High demand: There is a huge demand for organic products in India and across the globe, which generates more income through export.
- Nutritional: As compared to chemical and fertilizer - utilized products, organic products are more nutritional, tasty, and good for health.
- Environment-friendly: The farming of organic products is free of chemicals and fertilizers, so it does not harm the environment.

5) Polyhouse Construction

Introduction:

A polyhouse is the most demanding kind of greenhouse with a structure made up of galvanized iron structure with covering material of UV stabilized polyfilm. This structure utilizes the feature of controlled climatic conditions for the proper growth ofthe plants in different seasons. Polyhouse farming is a special kind of arrangement in which the crop field is completely or partially covered by transparent polyethene sheets. The nutrients are dissolved in water and supplied to plants through drip irrigation.

About Intervention –

Every plant or crops need a particular atmosphere and this is the reason you find different crops in different states and keeping this view of compatibility of different types of vegetables in mind Polyhouses are being built. Collaborated with Surabhi Foundation and Horticulture Department, Uttarakhand, 120 poly houses of 100 square meters were built in Gaindikhata clusters. The team of Unnat Bharat Abhiyan is conducted exposure visits to farmers for better use of polyhouses.

The polyhouses developed by Pt. deen dayal upadhyay science village school project in Gaindikhata cluster was very helpful in creating awareness for farmers.

Polyhouse in Surabhi foundation, Gaindikhata (right side of image is about seed germination)

Current Status of cultivators -

Polyhouse in process in Peeli Padaov

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