



Assessment of

‘Increased water efficiency and food production in key commodity value chains through multi stakeholder partnership applying a Push-Pull-Policy strategy

WAPRO Project

Final Report

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Executive Summary

Intercooperation for Social Development initiated the project ‘Increased water efficiency and food production in key commodity value chains through multi stakeholder partnership applying a Push-Pull-Policy strategy.’ aka WAPRO project in the Uttarakhand state in June 2015 with the support of Swiss Agency for Development and Cooperation (SDC). The project was focused on bridging the water productivity gap in basmati rice value chain by making best use of the available water through identified Water Efficient Techniques (WET) and encouraging farmers to conserve water and improve their income levels by adopting them. The phase I of the project ended in October 2018. A need was felt by the project implementation team for evaluating the project activities to understand the degree of achievement and gauge its replicability in other locations.

The overall assessment of the three year project was mostly done using Key Informant Interviews (KII), Interviews using semi-structured questionnaires, Focus Group Discussions (FGDs) and transect walks. A reconnaissance survey was carried out for three days followed by a detailed two weeks field survey in six sample villages of Uttarakhand. Individual interviews were carried out of project beneficiaries, Jalsakhis, Gram Pradhans, representative of Agriculture department, Professor from Pant Nagar University, chemical fertilizer shop owner and representatives from NBF and FFF. Focused group discussions were carried out with Water and Environment Group (WEG) members, non-beneficiaries, FFF members and with project team.

It was clearly visible from the field that WAPRO project is unique in itself due to certain approaches and elements that the project is built on and built within the project. While the very idea of building on existing projects of organic basmati rice and biogas plant in the project areas and addressing water management issues linking these projects is unique as it helps address the complete value chain from resource management to market link. In addition, the elements of field support through the Jalsakhis; creation of community based village level platforms called the WEG – Water and Environment Group; incorporating the idea of water stewardship at the local level to identify water infrastructure related issues and reviving them through community participation and contribution, has a very strong community development focus. All of these unique practices collectively leads to a sustainability model for the project.

Challenges within any intervention of scale is expected, and within WAPRO Phase I, the main ones related to farmer adoption of water efficient technologies (WET) and expansion of the farmer base within the project to include areas and farmers who are not part of the organic basmati rice project. Establishing market links for other organic produce besides basmati rice is a challenge, as it needs to become a viable profit making model. Addressing these challenges has to be at different levels – policy, market, and community level. There also has to be a link established between the various levels so that the solutions emerging are linked and build into a sustainable model. Strengthening the communities in terms of knowledge, skill, network, water governance/ policy is essential as they are the core of the program.

INTRODUCTION

Introduction

In India, 80 per cent of available fresh water is used for agriculture and around 50-55 per cent of it is used up by just two crops: rice and sugarcane. To produce 1 kg of rough rice, about 2500 liters of water is required which is derived from a large number of experimental data at the individual field level across Asia. The number varies from around 800 to 5000 liters depending upon crop management and weather along with soil properties. Experts and scientific studies in various science disciplines agree that water and irrigation issues are a key concern for global food security and that potential water conflicts are an essential risk for water scarce regions.

India is the largest producer and exporter of Basmati rice, which is a special variety of long-grain fragrant rice and is cultivated at the foothills of the Himalayan mountain range for several thousands of years. About two thirds of the basmati rice produced in India is exported. Basmati rice is grown exclusively in the northern part with Haryana accounting for 50 per cent of the area under basmati rice, followed by Uttarakhand and Uttar Pradesh jointly accounting for 25 per cent and Punjab (18%). In Uttarakhand, rice is the major cereal crop of kharif season accounting for more than 54 per cent of the total area under cereals in the state. The annual rice production of the state is around 5.5 lakh tonnes from an area of about 2.8 lakh hectares. Half of this area is in the hills and half in the plains, but the total production in the plains is almost two and half times the production in the hills. Rice is cultivated in all the 13 districts of the state. Districts Nainital, Haridwar and Dehradun occupy about 17.5 per cent area and contribute 22.2 per cent in the total production. High yielding varieties are popular in the plains of Nainital and Dehradun districts while local varieties are mostly grown in the hills.

Productivity of Basmati rice is 1,400 to 2,100 kg per hectare and there are several factors that affect the productivity. Weather and particularly monsoon plays a key role in the production and productivity of basmati. Despite the high average annual rainfall of around 1,650 mm, Nainital districts in the recent years has faced acute water shortage and as basmati rice requires good quantities of water, this shortage has impacts on its quality and quantity.

With its big export potential, import demands from other countries affect the price of basmati rice considerably; economic status of importing countries, the supply from Pakistan (also a Basmati growing country), affects international market. The Indian Government's export-import policy and domestic consumption patterns also impacts Basmati rice pricing.

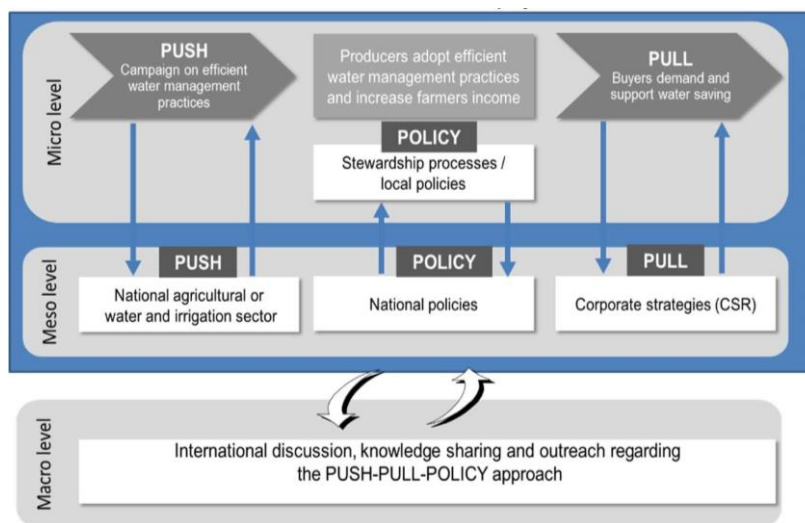
In India, marketing of agricultural produce is mainly carried out through traditional channels. In this process there is no premium for quality and therefore producers do not have any incentive to focus on improving the quality of the produce. This marketing approach is changing slowly, with increasing private sector role in food processing, exporting agriculture produce with rigorous certification. Increasingly, the focus is on supply chains for quality produce, especially where specific processing and export related requirements exist. Companies are establishing closer and direct association with farmers to ensure required quality.

The project 'Increased water efficiency and food production in key commodity value chains through multi stakeholder partnership applying a Push-Pull-Policy strategy.' aka WAPRO project was initiated in the Uttarakhand state from June 2015, with the first phase ending in October 2018. The project focus was to bridge the water productivity gap in basmati rice value chain by making best use of the available water through identified Water Efficient Techniques (WET) and encouraging farmers to conserve water and improve their income levels by adopting them. The approach necessitates the combined efforts of the stakeholders defined at different levels. Starting from rice production the project looked into other directly

related challenges at the farm level. The second phase of WAPRO began in November 2018, and will continue till 31 December 2021.

The project framework is based on three pillars Push, Pull and Policy. All the three pillars are cross-cutting the three intervention levels in the project Micro, Meso and Macro levels. The intervention levels of the project are as provided in Figure 1.

Fig 1: Intervention Levels of the WAPRO project



The WAPRO project funded by Swiss Agency for Development and Cooperation (SDC) is globally implemented by Helvetas Swiss Intercooperation, with the Intercooperation Social Development (ICSD) India, as the implementation partner for Helvetas Swiss Intercooperation, in India. The outreach of the project is as per Table 1. Coop, Reismuehle Brunnen (RMB) and Nature Bio-Foods (NBF) are corporate partners for Pull factor of the project.

Table 1: WAPRO project Outreach

Country	India
Region	Nainital District of Uttarakhand State
Commodity	Rice
Project partners	SDC, Intercooperation Social Development, India, RMB and NBF
Farmers (No.) in vegetation period 2014/2015 and corresponding acreage [ha]	1000 [300]
Farmers (No.) in vegetation period 2015/2016 and corresponding acreage [ha]	2000 [600]
Farmers (No.) in vegetation period 2016/2017 and corresponding acreage [ha]	3500 [1500]
Farmers (No.) in vegetation period 2017/2018 and corresponding acreage [ha]	4500 [2500]

Rational of the study

With phase I (2015-2018) of the project ending in October and new phase starting, there was a felt need for evaluating the project activities to understand the degree of achievement and gauge its replicability in other locations. Further this is the period when project learnings can be consolidated, success stories documented and recommendations made for future projects or address replication of the program in other areas.

Objectives

The objectives for commissioning of the study are as follows:

1. To evaluate the efficiency and effectiveness of the project interventions in improving water stewardship at village level within the WAPRO setting (PUSH-PULL-POLICY approach). The overall efficiency of the project will be measured by evaluating following components:
 - a) Functioning of the Water & Environment Groups (WEGs): Are they effectively addressing water issues at village level?
 - b) Implementation of water stewardship plans: Are suitable measures to improve water availability and productivity identified and implemented? Are suitable maintenance mechanisms in place and functioning?
 - c) Joint efforts: Is the collaboration and co-funding mechanism between the different stakeholders working effectively and efficiently (households, WEGs, municipalities, farmer organization, business partners, government agencies, project team)?
2. To document successful cases of village-based water stewardship in attractive formats (illustrated brochure, short video).
 - a) Present the promoted approach based on successful cases from at least three villages in the form of an illustrated brochure (max. 4 pages) that can be used for knowledge sharing and advocacy
 - b) The same in the format of a short narrated video (max. 4 minutes).
3. To provide relevant recommendations
 - a) On how to enhance effectiveness and efficiency of promoting water stewardship at village level and on how to further improve interventions
 - b) To local and national policy makers and relevant government institutions.

Study outputs

- **An evaluation report** on efficiency of project interventions under the three project pillars which is the output for objective 1 of the study. A detailed list of recommendations are being provided based on suggestions received through multiple interactions with the project beneficiaries, government officials, project team members, and other relevant stakeholders. These recommendations provide a roadmap for replication of the project in other districts in Uttarakhand and other states as well, further it will also provide future policy directions in the water sector given the competing demands of this depleting source.
- **Brochures on success story** are being developed through interactions with the field staff at the first level and subsequently from the field visits and through in-depth interviews and observations from the field. The brochure is designed to reflect the project achievements through case studies, while communicating effectively the process followed to facilitate up scaling to other states or regions.
- **Video film:** Similar to brochure the video film also aimed at reaching larger audience with clear messages on how to improve the water use efficiency and productivity by promoting Water Stewardship plans at village level. The team interacted with the projects staff to clearly understand

the strategy, timeline, story line and budget. Script was developed through in-depth discussions with the field team and the production team identified the shooting locations based on the field visits and in consultation with the WAPRO team. Access to appropriate equipment's for still pictures, video shooting and voice recording, while interview questionnaire, etc., was ensured. Post-production activities had been taken care by the production team and including - logging interviews, video editing, ensuring clarity in story and selection of music, good images and graphics to support the story.

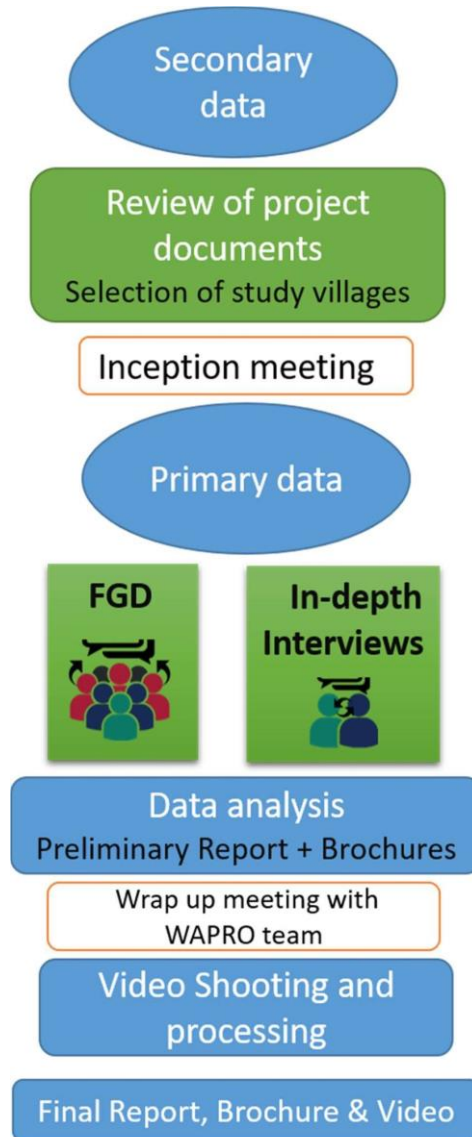
Report outline

The report is systematically separated into six sections. The first section i.e Introduction focuses on the need of the project assessment, specific objectives and study outputs. It is followed by methodology section which elaborates the techniques and processes used for assessment from the methodological perspective. Study sites section gives a brief idea about geographical location and demographic characteristics of the selected six villages along with the status of work completed under WAPRO project. The next section focuses on the best practices adopted in the area particularly about the concept, functioning processes, the positive element and perceived benefits under each of the best practice. Further in the last section, the challenges observed and as reported by various stakeholders have been summarized which leads to the recommendation part.

METHODOLOGY

Methodology

The methodology for the project assessment has been set up in such a manner that activities under each component viz. PUSH, PULL and POLICY can be reviewed thoroughly for this three year project.



Data Collection

The data collection included primary and secondary sources which are being validated and triangulated.

Secondary data collection

The project documents and the monitoring data provided by WAPRO team served as secondary data for the study. This data aided in understanding the project's achievements over the last three years and set as the base for selection of the study villages as well as the beneficiaries and other relevant stakeholders involved in the project. This review also helped in defining the sample size and to some extent in identifying the project stakeholders for conducting the interviews, focus group discussions, key informant interviews

etc. Further this data helped the study team to understand the scale of the project, various interventions promoted and innovations adopted by the farmers.

Inception Meeting

A three day inception meeting was conducted with the WAPRO team at Haldwani, during second week of December, 2018. A team of three members from SaciWATERs visited and interacted with the WAPRO team at the Haldwani office and also visited selective field sites ahead of the fieldwork and primary data collection. The purpose of this visit was to

- share the study teams understanding on the WAPRO project and scope of the assessment and identify the secondary data available
- Finalize timeline and deliverables for the study
- fine tune methodology
- finalize study villages
- learning about success stories
- Gathering contacts of the interviewees.



In terms of secondary data an effort made to collect micro-data such as composition of WEGs, list of trainings conducted, list of WETs adopted, other additional interventions from the project.

Sample Selection

For assessing the success of the WAPRO project it very important to select the right beneficiaries under this study. Hence, a careful sample selection has been proposed as given below. The outreach of the WAPRO project as mentioned in the document shared by ICSD is:

Vegetation period	No. of farmers	Corresponding acreage (ha)
2014/2015	1000	300
2015/2016	2000	600
2016/2017	3500	1500
2017/2018	4500	2500

The project beneficiaries for interviews were selected randomly covering various vegetation periods for which they have adopted improved technologies. The beneficiaries covered were within the following groups:

Number of vegetation periods for which the improved technology is adopted
≥ 3 vegetation periods (2015-16, 2016-17, 2017-18)
≤ 1 vegetation period between 2015 and 2017
≤ 2 vegetation periods (started and discontinued and started again)

Equal number of women farmers as well as small holding farmers were covered.

The control group of non-beneficiaries were also interviewed to further understand the impact of the project. The non-beneficiaries were selected using random purposive sampling from non-project areas or the farmers who have not been covered by the project in the selected six villages.

Primary Data Collection

Post the analysis of the secondary data collected from the project documents and the interactions with WAPRO team, the fieldwork commenced in 6 selected study villages. The detailed fieldwork was conducted for around two weeks during January 2019. The focus was on evaluating the Push, Policy and Pull pillars of the project. A detailed checklist was developed for relevant individuals and groups, after the preliminary field visit and it was further refined based on comments from WAPRO team at ICSD office and field site (Annexure 1).

The study used a mixed methods approach for primary data collection. The details are mentioned in the section below.

Research Methods

The methods included, Key Informant Interviews (KII), Interviews using semi-structured questionnaires, Focus Group Discussions (FGDs) and transect walks.

Focus Group Discussions (FGD)

FGDs were carried out with the Water and Environment Group (WEG) members from three villages viz. Mallisethi, Dhamola and Kyarigaon which helped in assessing the functionality of the WEGs in terms of addressing water issues at the village level.

One FGD each in six villages was planned with the stakeholders of the Water Stewardship plans to evaluate the POLICY component of the project. However, it was merged with the WEG's FGD and was directed towards understanding the status of implementation of WS plans from different stakeholders. Also, prior to the actual fieldwork, FGD with the project beneficiaries was in plan to specifically evaluate all the three pillars of the project. Based on the field conditions and availability of the people only individual interviews were conducted with project beneficiaries. With non-beneficiaries one FGD was conducted to have a comparative understanding about the project from two different ends.



Individual Interviews

Interviews with project beneficiaries were carried out using semi-structured questionnaires, focusing on quantifying the change in productivity, improved quality of water and soil and change in income before and after project intervention. The interviews also captured the farmer's ease of access to market and overall impact as a result of the project interventions. The individual interviews helped gather quantitative information from selected farmers that is more detailed. Also, specifically under the PUSH component, the interview was directed towards understanding status of implementation of Water Stewardship (WS) plans, functionality of WEGs, adoption of Water Efficient techniques (WET), its impacts on crop productivity and income and, the inputs received through the project through the Jalsakhis. Under the PULL component, the interview mainly focused on understanding of change in access to market after the project intervention, the status of funding for drinking water and irrigation infrastructure in the village, the effectiveness of collaboration and co-funding mechanisms in place.

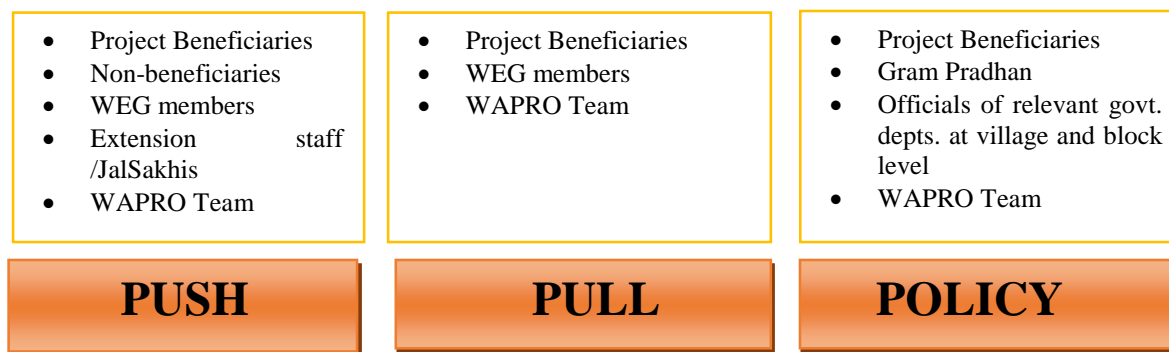
In addition to the above, additional interviews were conducted with the Jalsakhis, Gram Pradhans and other officials mainly from agriculture and irrigation departments to understand the progress made under the PUSH and the POLICY pillar. The interviews were focused on understanding the status of the WS plans from the Panchayat's perspective as they are the major stakeholders in the implementation. Though we planned to meet irrigation department official but it could not happen due to unavailability of the concerned official during the period. Another interview was held with Nature Bio-Foods (NBF) to understand the market status and support services. Interview of Prof. DK Singh, Pantnagar University was also carried out.



The detailed plan of work

Date	Place	Activity
8-01-19	Ginti Gaon	**II - beneficiaries, Jalsakhis, FFF (Pavitra), Gram Pradhan
9-01-19	Mallisetty & Tiware Gaon	*FGD- WEG, II - beneficiaries, Jalsakhis, Gram pradhan
10-01-19	Dhamola	FGD-WEG, Non-beneficiaries
11-01-19		II- beneficiaries, Jalsakhis, Gram Pradhan, Irrigation dept, Pant nagar university, Agriculture department
12-01-19		II- NBF
14-01-19	Kyari Gaon	FGD (WEG), II - beneficiaries, Gram Pradhan, Jalsakhis
15-01-19	Patkot	FGD-FFF, II -beneficiaries, Jalsakhis
16-01-19		Internal meeting – WAPRO team
		*FGD- focused group discussion, **II – Individual Interview

Target groups/ Respondents of the study



PUSH: Capacity building of farmers on WET's and WS, cultivation using Water Efficient Technologies (WET) and Water and Environment Groups (WEG) are being formed for implementation of Water Stewardship (WS)

PULL: Project incentivize farmers for water efficient production by paying additional Rs 1 /kg of basmati rice

POLICY: Through demonstrations and data, policy level dialogues initiated to adopt water efficient technologies in departmental plans and adopt water stewardship approach amongst different stakeholders including Gram Panchayat and line departments.

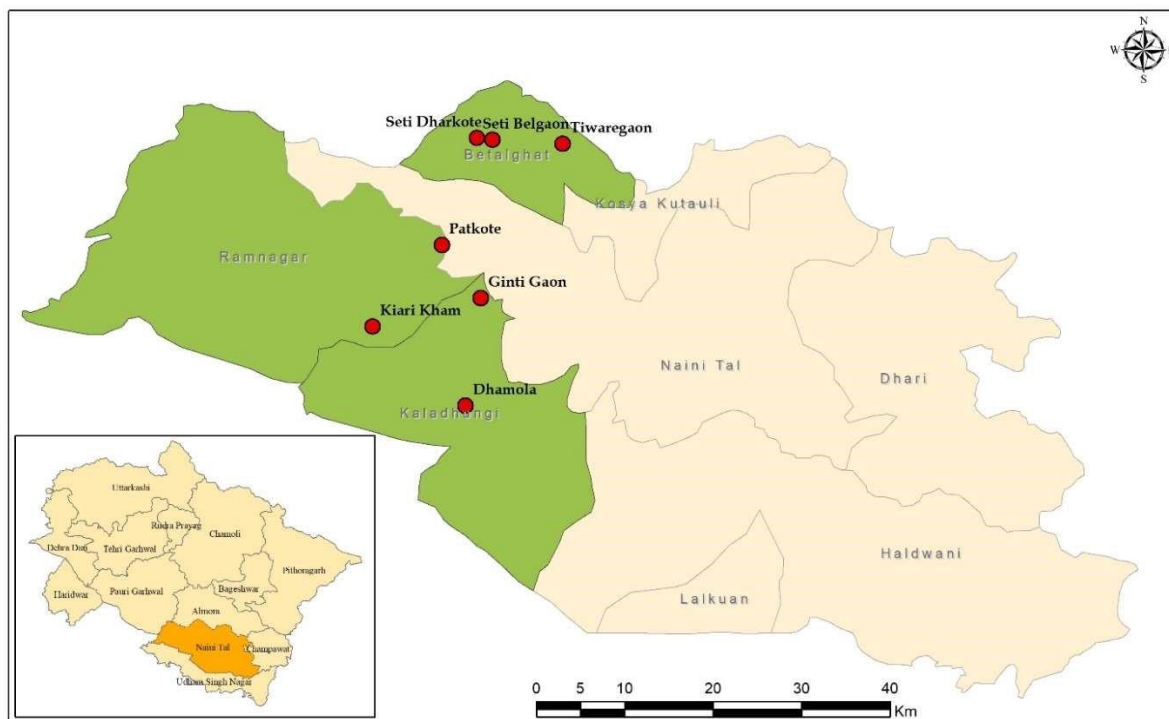
STUDY SITES

Study Sites

The project intervention areas are parts of three blocks of Nainital district of Uttarakhand. Around 4500 farmers were trained in water saving technologies and water stewardship during the period of three years.

Country	India
Region	Nainital District of Uttarakhand State
Commodity	Rice
Project partners	SDC, Intercooperation Social Development India, HSI, RMB and NBF
Farmers in vegetation period 2014/2015 and corresponding acreage [ha]	1000 [300]
Farmers in vegetation period 2015/2016 and corresponding acreage [ha]	2000 [600]
Farmers in vegetation period 2016/2017 and corresponding acreage [ha]	3500 [1500]
Farmers in vegetation period 2017/2018 and corresponding acreage [ha]	4500 [2500]

The selection of the villages was based on the review of secondary data and consultations with the WAPRO project team both in Hyderabad as well as in Haldwani. Six villages from three blocks were selected for the monitoring and evaluation study. This section discusses the detailed profile of the selected villages.



Tehsil map of Nainital district showing the interventions area and samples sites

Betalghat Block

Tiwarigaon

Situated on the bank of Kosi River in valley and surrounded by high hills the village has 80 households as per census, 2011. The total population of the village is 413 (M-188 , F-225). Total geographical area under the village is 57 hectares. Main agriculture commodity of the village is paddy. The net sown area is 65% of the total village area and almost entirely is irrigated by canal.

However, after the floods in 2010 which led to destruction of the irrigation canals the cropping pattern has been under constant change. Though the farmers still insist and are looking at alternate sources for irrigation, the shift towards Amaranthus and rabi crops has been emerging lately.



The access to irrigation water has been plaguing the village. Water was released in the canal during Kharif, but during Rabi and summer, there was no irrigation water released for the village. The canal that distributes water is an earthen canal, with no lining, resulting in loss of water due to percolation.

As an interim step, the main canal getting water to the village has been desilted and lined with tarpaulin sheets to reduce percolation loss. The village plans to take up concrete lining of the canal so as to ensure water being made available to the tail end farms.

Work done by ICSD under WAPRO project-

- Trainings on WAPRO and Water Stewardship. 102 farmers trained.
- Participatory Rural Appraisal conducted to formulate Water Stewardship plans
- Water Stewardship survey of 22 farmers conducted.
- Water and Environment Group formation – Jagriti Jal Evam Paryavaran Samooh (formed on 10-03-2017)
- WAPRO demonstration taken on Water Efficient Techniques System of Rice Intensification, Alternate Wetting and Drying, Soyadhan, Continuous Flooding in Kharif season and Line sowing of crops Lentil, Chickpea, Wheat and Vegetables, Compost making.
- Number of Water Stewardship plan executed – 02 (Manual water filter in Government school and one water lift pump for irrigation water supply)

MalliSethi

Parts of Sethi Belgaon and Sethi Dharkote has been taken as Malli Sethi for the study. Similar to Tiwargaon, both the villages situated in the river valley adjoining to the river Kosi surrounded by hills and dense forest. The total number of households in total are 150 in two villages and population is 781 (M- 375, F- 406). Geographical area of Sethi Belgaon and Sethi Dharkote is 15 and 476 hectare respectively. 90% of the area is culturable wasteland and hardly 7% area is sown. Very small patch of land is irrigated with canal irrigation. Paddy and Barley are the major crops sown in the village.



The village has the forest area as a boundary on one side and the mountains on the other. The main issues that the farmers face are – damage in the main canal & the canals to individual farms; - wild animal attack on crops along the forest boundary.

To address this, under WAPRO, through Additional activities fund the farmers have repaired the main canal and have created awareness and system so that the water channels to individual farms are not damaged. To address the attack on crops by elephants, monkeys, wild boars, etc., fencing along the boundary has been established. The farmers demand additional 800mts extension to the existing fencing.

Work done by ICSD under WAPRO project–

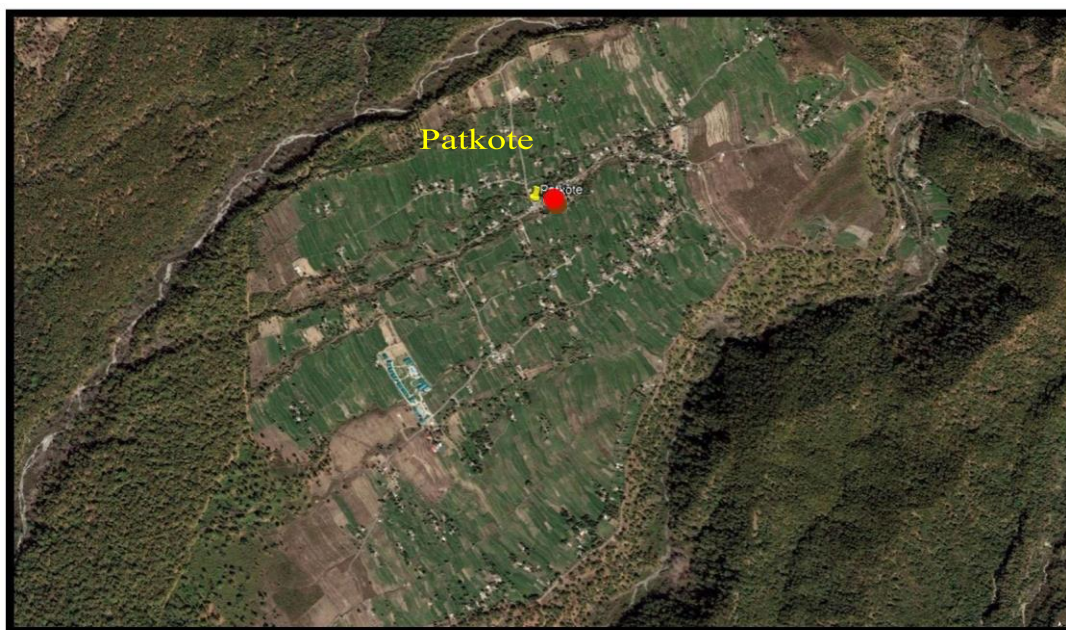
- Trainings on WAPRO and Water Stewardship. 115 farmers trained including Sethi Belgaon and Sethi Dharkot.
- Participatory Rural Appraisal conducted to formulate Water Stewardship plans
- Water Stewardship survey of 10 farmers conducted.
- Water and Environment Group formation – Sethi Belgaon Jal Evam Paryavaran Samooh (formed on 10-10-2017)

- WAPRO demonstration taken on Water Efficient Techniques System of Rice Intensification, Alternate Wetting and Drying, Soyadhan, Continuous Flooding in Kharif season and Line sowing of crops Lentil, Chickpea, Wheat and Vegetables.
- Number of Water Stewardship plan executed – 02 (Water cooler and filter installed in Government school and Canal repair work)

Ramnagar Block

Patkot

Patkote is big village with total geographical area of 358 hectares and 350 households. The total population is 1725 people (M-875, F-850). 75% of the village area is sown and mostly irrigated with canal. Major issues in the village are animal attacks in farm and strengthening of irrigation systems with repair at water source and canal repairs.



Work done by ICSD under WAPRO project-

- Trainings on WAPRO and Water Stewardship. 118 farmers trained.
- Participatory Rural Appraisal conducted to formulate Water Stewardship plans
- Water Stewardship survey of 37 farmers conducted.
- Water and Environment Group formation – Patkot Jal Evam Paryavaran Samooh (formed on 15-09-2015)
- WAPRO demonstration taken on Water Efficient Techniques System of Rice Intensification, Alternate Wetting and Drying, Soyadhan, Continuous Flooding in Kharif season and Line sowing of crops Lentil, Chickpea, Wheat and Vegetables, Compost making.
- Number of Water Stewardship plan executed – 02 (Water cooler and filter installed in Government school and hospital, canal repair)

Kiari

Kiari village has two hamlets Kiari Kham and Kiari Bandobast with total 127 household in Ramnagar block. Total population of the village is 619 (M-302, F-317). Total geographical area is 33 hectare and out of which only 13 hectare is net sown area which is mostly irrigated by canal. Kiari gaon is situated inside the Jim

Corbett National park and surrounded by forest from sides. A tributary of Kosi River flows from the southern part of the village.



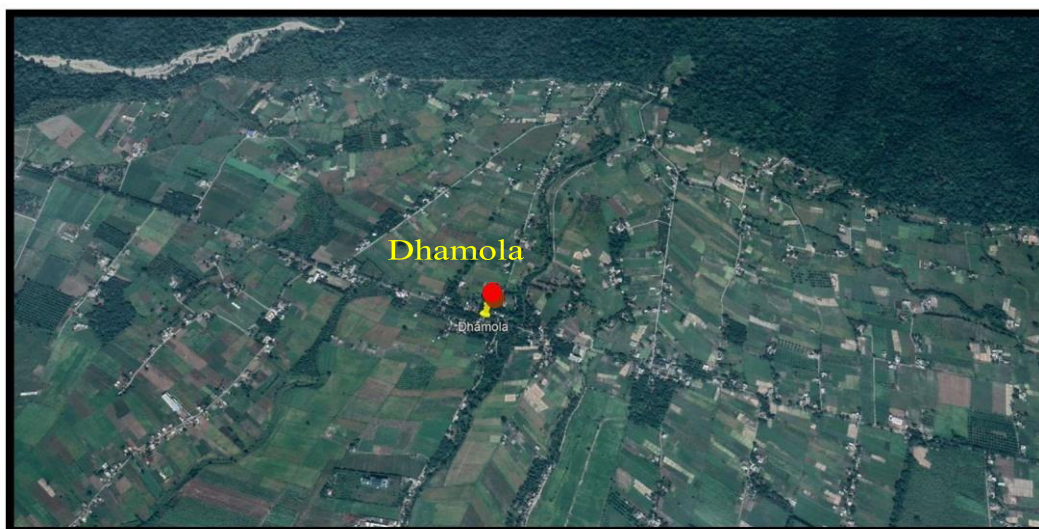
Work done by ICSD under WAPRO project-

- Trainings on WAPRO and Water Stewardship. 51 farmers trained.
- Participatory Rural Appraisal conducted. to formulate Water Stewardship plans
- Water Stewardship survey of 13 farmers conducted.
- WEG formation – Kyari Jal Evam Paryavaran Samooh (formed on 20-11-2015)
- WAPRO demonstration taken on Water Efficient Techniques System of Rice Intensification, Alternate Wetting and Drying, Soyadhan, Continuous Flooding in Kharif season and Line sowing of crops Lentil, Chickpea, Wheat and Vegetables.
- Number of WS plan executed – 04 (Desilting tank construction, 2 Canal repair work and 1 water cooler and filter installed in Government school)

Kotabagh Block

Dhamola

Dhamola village in Kotabagh CD block is the largest among all the selected villages with 353 household and 1757 people (M- 899, F-858) residing there. Total geographical area is 271 hectare. Paddy, wheat and other pulses are being cultivated in this village.



Work done by ICSD under WAPRO project:-

- Trainings on WAPRO and Water Stewardship. 120 farmers trained.
- Participatory Rural Appraisal conducted. to formulate Water Stewardship plans
- WAPRO demonstration taken on Water Efficient Techniques System of Rice Intensification, Alternate Wetting and Drying, Soyadhan, Continuous Flooding in Kharif season and Line sowing of crops Lentil, Chickpea, Wheat and Vegetables, compost making.
- Water and Environment Group formation – Dhamola Jal Evam Paryavaran Samooh (formed on 11-05-2017)
- Number of Water Stewardship plan executed – 01 (Source repair work for supply of clean drinking work for community)

Gintigaon

Adjacent to Corbett National park, the village has 218 households and 1161 people (M-587, F-574) are living there. Total geographical area is 135. Paddy, wheat and pulses are the major crops in this village.

Work done by ICSD under WAPRO project-

- Trainings on WAPRO and Water Stewardship. 77 farmers trained.
- Participatory Rural Appraisal conducted. to formulate Water Stewardship plans
- Water Stewardship survey of 20 farmers conducted.
- Water and Environment Group formation – Ginti Gaon Jal Evam Paryavaran Samooh (formed on 24-02-2017)
- WAPRO demonstration taken on Water Efficient Techniques System of Rice Intensification, Alternate Wetting and Drying, Soyadhan in Kharif season and Line sowing of crops Lentil, Chickpea, Wheat and Vegetables, Compost making.
- Number of WS plan executed – 01 (Canal repair work and new slab construction)





BEST PRACTICES



Best Practices

Agricultural produce in general, is resultant of perfect combination of multiple variables including a particular set of climatic condition, appropriate amount of water, good quality seeds, nutrients and fertile land. Even after the production of good quality crop product, the market access and linkages plays a key role in the entire process. The WAPRO project in Uttarakhand endeavours to make the best use of available water by introducing select Water Efficient Techniques and encourages farmers to improve their income levels by adopting them along with building on their own past initiatives in the region such as promoting organic farming and bio-gas production for the sake of environment and sustainability.

Best practices generally refers to the most efficient and effective way to accomplish a desired outcome. The approach requires the combined efforts of the stakeholders defined at different levels under the WAPRO project. Based on field insights through focused group discussions, individual interviews with various stakeholders such as project beneficiaries, non-beneficiaries, Jalsakhis, Gram Pradhans, members of Water and Environment Group and officials from government departments and universities led us to identify a few of the best practices being followed under the project.

Best Practice 1: JalSakhi

“JalSakhi” (Friend of Water / water friendly / water friend) – the name says it all. Jalsakhis are identified women from the project area, interested in water resource management and creating awareness among the communities about water efficient technologies. These women farmers are water friendly and their knowledge on water and its efficient use for agriculture and domestic purpose is built through training under WAPRO. They promote optimum utilisation of water, water source maintenance and upkeep of water quality and on infrastructures, through the water and environment groups in the villages. They are enablers, facilitator and advocates for efficient water use in the areas they serve.

The concept and functioning

The first JalSakhi was recruited in 2015 and currently there are 7 JalSakhis under the program covering about 80 villages including adjoining hamlets. The unique concept has been a great success within the project. Women farmers from the project area, are identified based on their interest and commitment towards the project goals, and are eager to learn and share the learnings within the communities are identified, their capacities built on various components of water efficient techniques (WET), organic farming, vermicomposting, water quality testing, biogas plant management and on community capacity building approach. They share the knowledge gained with the organic basmati rice cultivators in the identified project villages. While the Jalsakhi’s bring in a strong women’s presence in the program, their acceptance within the villages as competent farmers and as a knowledge repository on water management issues is creating a wave change, encouraging other women farmers to participate actively by undertaking WET and other related activities under the project.

Most JalSakhi’s are farmers and the inspiration to work as JalSakhi’s emerged from their field experience and the hardships faced with regards to resource management, particularly water and soil. The understanding they gained during



their training under WAPRO on water conservation and sustainable approach has strengthened their commitment to take this forward. The JalSakhi's have received several trainings and had exposure visits to several places over the past years and have been trained in, composting, soil quality testing, intercropping, line sowing, water conservation, System Rice Intensification (SRI), Alternate Wetting and Drying (AWD), direct seeding, water quality testing, weed control training, demo plots preparation, rainfall measuring, computer training, etc.

Each JalSakhi covers 5 to 20 villages and holds regular meetings/ training for the WEGs. Diverse activities are carried out during the meetings, including, village level water related planning, capacity building, set up demo plots, visit participating organic farmer's fields to monitor crop growth, pest and nutrient control and provide training on relevant issues under the program. Meeting and training records are maintained by the Jalsakhis with a record of the WEGs members who participated in the meetings.

The positive element

The Jalsakhis shared that as individuals they gained a lot from being associated with the WAPRO project. The positive aspects listed by them include:

- Increase in knowledge on sustainable farming practices – WET and Organic farming
- Meet new people, acquire new knowledge and skills
- Being independent and earning income for the family and child
- A good feeling to be working
- Recognition in the villages – people recognize as 'water lady'
- Community talks about project issues and listen to the JalSakhi's advice. People attend meetings and training when organized.

The impact of the project

According to Jal-Sakhis the following are the major impacts from the project

- Being able to build the confidence of women farmers and mobilize them to be part of WEGs. The women farmers now undertake project activities in their farms. There is a marked change in their awareness levels, participation and decision making roles.
- Making available safe clean drinking water to children and ailing, by providing water filters and coolers in schools and hospitals.
- Ensuring sufficient irrigation water to tail end farmers through canal repair works and checking leakages.
- Improving the knowledge levels of the community members about water conservation and organic farming, resulting in more farmers adopting organic farming. This has resulted in an increase in their returns from the agriculture sector.
- In view of the limited financial resources available, several Jal Sakhi's have demonstrated effective use of available funds through the Panchayat, Government and other agencies. They have initiated successful dialogue with the Gram Pradhan and Government departments, tapping their resources for implementing the Water Stewardship plans.
- In a particular instance, a Jal Sakhi mobilised people and the media to successfully put pressure on irrigation department to undertake water infrastructure related work in water scarce Tiwari Gaon region of Betalghat.

In several instances, The Government Departments, Gram Pradhan and other agencies were approached to leverage funds for proposed activities under the water stewardship. The WEGs, led by the Jalsakhi's proposed the works through government agencies and were successful in getting funds to carry out water stewardship plans in their villages. Below are some examples where the WEGs have successfully bridged the financial gaps by engaging with different stakeholders and have created examples for others to follow.

Village	Story
Khupa (Betalghat)	Khupa is a village in Betalghat block with a population of 200. The WEG was formed on 10 April 2017 by the name ' <i>Khupa Jal evam Paryavaran Samooh</i> '. The villagers had to face an acute shortage of drinking water in the village and they had to fetch water from another village on their own. This issue was raised during regular WEG meetings at the village. The Jal Sakhi's presented the WEG with an idea to sort out the problem and the process to do so. With a positive motivation and approach, WEG members gave a thought on how the water problem of the village can be solved. They developed a Water Stewardship plan on the development of new source and linking the water pipelines to the village. WEG did a feasibility study with the help of ICSD and approached Panchayat, ICSD, MLA for mobilisation of fund. At the end, the influence of the group members was so high that plan got executed solely by MPMLAD fund. An initiative by the project and Jal Sakhi's of the area to motivate the WEG members proved to be beneficial for the betterment of the water condition of village.
Tiwari Gaon (Betalghat)	Tiwari gaon, with total population of 413 lies in Betalghat block. The WEG was formed on 10 March 2017 by the name ' <i>Jagruti Jal evam Paryavaran Samooh</i> '. WEG has a maximum of women members who acts as the main decision maker within the activities of the group. The group had been strengthened with the regular efforts of Jal Sakhi ' <i>Mrs. Seema Tiwari</i> ' at the village. The condition of access to Irrigation water is poor in the region. WEG had prepared Water Stewardship plan on Repair of Head for proper flow of Irrigation water in the canals. The proposal was forwarded to the line departments, but the action was not being undertaken for a long time. WEG decided to raise the issue with support of local media. Soon, the departments felt pressurised and noticed necessity of irrigation water in the village and came to meet the villagers. This was then incorporated in the action plan of irrigation department and they assured that the problem will be resolved very soon. Thus, WEG became the driving force to mobilise the departments for improving the water situation of their village.
Dhamola (Kotabag)	Dhamola village has a total population of 1757 and lies in Kotabag block. WEG was formed on 11 May 2017 by the name ' <i>Dhamola Jal Evam Paryavaran Samooh</i> '. WEG Dhamola has proved to be a model group who has inspired the village lying in its periphery as well as activated the line departments. From the initial meetings on WEG formation, describing its purpose and executing the work, Dhamola has stepped forward in every aspect of conserving the water in the village and justified the meaning ' <i>Unity is Strength</i> '. A source repair work had been undertaken in the village as per the Water Stewardship plan. With the completion of work, villagers also realised the declining condition of drinking water. During the WEG meetings, it was decided to link with the drinking water department and they forward the proposal of improving drinking water facility of the village. Soon, in a positive move, the WEG driven <i>Jal Sansthan</i> who is responsible for the pipeline work executed the works for drinking water in the village. This represented the united efforts of WEG to link up with the proper source and improving the water situation of the village.

Khempur (Kotabag)	With the actions undertaken by WEG Dhamola, a nearby village Khempur's Gram Pradhan approached WEG members of Dhamola on how the process was initiated. They were informed about the efforts of the Jalsakhi, Janki Sati and the process of formation of WEG group. Khempur Pradhan showed interest in the work and immediately asked inclusion in the project and provide villagers trainings and form the WEG group. Khempur group was formed on 9 June 2018 by the name ' <i>Khempur Jal Evam Paryavaran Samooh</i> '. The Water Stewardship plan was formed and soon a Canal repair work for improving the irrigation water situation of village was undertaken. The irrigation department was informed about it, however, the funds were contributed by ICSD. This set an example of cross-learning.
Gebua (Kotabag)	Gebua Panchayat has a total population of 1204 and is located nearby Khempur. With the progress seen in water condition of the nearby villages, Gram Pradhan is approaching Jalsakhi to provide trainings and strengthen the villagers in their region by forming WEG.
Belparao (Kotabag)	Belparao has a total population of 2203. WEG was formed on 28 July 2017 by the name ' <i>Belparao Jal Evam Paryavaran Samooh</i> '. WEG members had been regularly provided information on water and environmental related activities and have been active in improving the water condition of village. The Water Stewardship plans were made on drinking water source repair and irrigation canal repair. WEG linked with departments like SWAJAL and executed a Water Stewardship plan on drinking water pipeline. This is an example of good cooperation and rise in the motivation level of the villagers.

Best Practice 2: Water Environment Groups and Water stewardship

The Water and Environment Groups (WEG) was conceptualized with the intent to develop a sense of ownership amongst the communities to take on the responsibility of a 'Water Steward'.

The concept and functioning

The WEG formation is facilitated by the Jalsakhi's as a step towards implementing activities under WAPRO project. The Executive Committee (EC) of WEG comprises of 10 members with four functionaries elected to be the President, Vice President, Secretary and Treasurer. It is mandatory to have at least 40 per cent women farmers in the executive committee. The entire village can be included as WEG members.

The meetings are generally conducted once a month by the WEG members or sometimes once in

2 months. Currently the Jalsakhi's are responsible for organizing the meetings. Members discuss and bring forth water related issues within the village and list the works that need to be taken up on a priority basis. The plan that emerges from this discussion ends up to become the 'Water Stewardship' plan.



Water Stewardship, is defined as the use of water in a socially equitable, environmentally sustainable and economically beneficial manner, achieved through a stakeholder-inclusive process that involves site and catchment based actions. The Standard provides a consistent global framework for sites to undertake

responsible water stewardship in a manner that is transparent and stakeholder-inclusive. Specifically, the Standard is designed to achieve four water stewardship outcomes: (1) good water governance, (2) sustainable water balance, (3) good water quality status and (4) healthy status of important water-related areas. It is important to note that these four outcomes are most sustainable when achieved collectively.

Initial Water Stewardship Survey conducted in 20 project villages in the three blocks of Ramnagar, Kotabag and Betalghat indicated that areas have access to irrigation and drinking water through water sources like canals, tubewells, spring, stream, rivers, etc., but there is a need to develop a local water management plan that benefits most of the water users. Therefore Participatory Rural Appraisals (PRAs) were conducted and local Water Stewardship plans developed.

By the end of phase one of WAPRO, 75 WEG's have been formed and 200 water stewardship plans received from these villages. Of these, 23 plans on irrigation water are complete and 32 plans included safe drinking water proposals in them. The irrigation plans included canal repair works, repair of water sources. Drinking water proposals included installation of pipelines for smooth and proper flow of drinking water and installing water coolers and filters in schools and hospitals for providing safe drinking water to children and the ailing.

The positive element

- WEG has resulted in strengthening the network within the village, on addressing a common water related concern, for both drinking and irrigation purpose.
- The WEG group has also started addressing related issues such as wild animal attack on crop, lobbying with department for a NOC, etc.
- Women are getting empowered within the WEG and are taking decisions on water related issues – in some villages the WEGs is constituted by women members only.

The impact of the project

- Regular cleanliness drive at natural springs which are the water source and of the canals are conducted to motivate and mobilize communities towards maintenance and upkeep of the resources and to instil a sense of ownership of assets. Water Stewardship pledge promoted through schools and WEGs create awareness about need to take care of the water sources.
- WEG's have realise the need for monthly contribution from each household towards maintenance of the water infrastructures that were repaired. Account maintenance is the responsibility of the EC.
- According to a WAPRO report, through the WEG initiatives, total families who have benefitted by the irrigation activities are 1,624 and area covered is 8,847 bighas. A total of 10,000 persons have benefitted by the drinking water related activities.

Best Practice 3: Revival of water infrastructure

Across hills of Uttarakhand perennial springs form the main source of water, used both for drinking and irrigation purpose. These water sources flow through forest areas, collecting organic residues of decaying plant material and soil particles. This water is used for irrigation, drinking and cooking purpose. Over time the canals have been damaged or the flow exceeded the canals potential. A need for revive these structures was a strong felt need among many of the project villages.

The concept and functioning

Each of the WEGs through the Water Stewardship plans, identify water related issues that need immediate attention. The community as a collective agree to contribute at least 20 per cent of the overall project cost, either in cash or kind.

Post monsoon, the drinking water quality becomes very poor and this concern was raised and village communities wanted to address this issue by installing water coolers and filters in schools and hospitals for provisioning clean and safe drinking water. Collection chambers that supplied water from the source in the forest to the villages were damaged and needed repair. Laying new drinking water pipeline was the need in some villages. Water filtration chambers at the source needed repair, new water collection and supply tank construction were needed. The activities were taken up as envisaged by the communities.

For irrigation purpose, many infrastructure related requirements range from canal repair, new canal construction, desilting tanks and water tanks constructions, pipelines, net for safety of water source, etc were identified by the farmers and undertaken under the project.

Inter Cooperation has over time, identified a set of contractors who have shown interest in taking up the infrastructure related works and are contacted when there is a requirement for canal repair or canal construction or pipe laying works. Through a bidding process, the contractor is identified for each job.

The positive element

- The community contribution of at least 20 per cent is followed across project areas, with many contributing in kind, through Shramadan (labor contribution).
- Local people are responsible for installation and monitoring. For example, implementing body for the Water Cooler and Filter in some cases are the 'Parents Teacher Association' while the monitoring is done by village WEG.

The impact of the project

More than 30 drinking water structures has benefited more than 10,000 families and several thousands of children in the project areas.

More than 20 irrigation works have benefited more than 1500 families, covering about close to 7000 bhiga of agriculture land across the 3 blocks of Betalghat, Kotabag and Ramnagar.

Best Practice 4: Community empowerment

Community empowerment strategies include community organizing, where by people are mobilized and trained to address local problems and voice their concerns within institutions and decisions that affect their lives and communities. In addition they also improve the economic conditions within the region.

The concept and functioning

WAPRO project has a strong community empowerment component. Mobilizing communities to think about and plan for sustainable resource management is the core. Push Pull and Policy are three approaches to achieve this. To empower and mobilize, the learning curve has to move upwards. Under WAPRO capacity building, knowledge and skill enhancement, is achieved through workshops, training, exposure visits, exposure at events, cross learning visits to other project sites, etc. From JalSakahis to the farmers to policy makers and department staff, training is organized on a regular basis on relevant issues by IC staff, by subject experts from Agriculture University and by the JalSakhis themselves.

Exposure visits help the WEG members develop new ideas for water related proposals in their areas. They learn about the maintenance systems adopted and understand the diverse type of issues faced in different villages.

Exposure visits to events like BIOFACH, held annually in New Delhi, where marketing agencies from different corners of the world working in organic sector gather and publicize their products is a great way to sensitize the farmers on the opportunities globally.

Stakeholder workshop involving Gram Pradhan from different villages, representatives of Agriculture department, Irrigation department, experts of GB Pant University to share the various schemes available within their departments and how to avail them.

The positive element

- For the JalSakhi's learning has been continuous and on diverse topics including water quality testing, rainwater measuring, computer training, record maintenance, etc., in addition to training on WET and Organic farming.
- They are now able to transfer their knowledge, skills and capabilities to other farmers, through WEG level trainings diverse issues including - organic basmati rice cultivation, SRI, bio pesticide preparation, organic fertilizer, composting, use of biogas slurry in compost, line sowing of wheat and soya, intercropping concept, AWD (Alternate Wetting and Drying), etc.

The impact of the project

Farmers are aware of water issues and the need to address this locally. They understand that Water Efficient Techniques such as SRI, AWD, line sowing, intercropping, etc., have potential to help address water scarcity issues.

JalSakhi's have established demo plots to show the improved productivity through adoption of line sowing, inter cropping, composting

Best Practice 5: Addressing complete value chain and Fair Farming Foundation

Under the organic basmati rice project, Organic certification and Fairtrade certification are part and parcel of the process. Organic certification is given to farm lands that have for the past 2-3 years been cultivating organically. Fairtrade changes the way trade works through better prices, decent working conditions and a fairer deal for farmers and workers in developing countries. It look at the value chain, that is the full lifecycle of a product or process, which is more than a supply chain.

According to Ashish, NBF, "Fair trade standards focus on sustainability (water, soil, environmental conservation, biodiversity maintenance at farm level & catchment level), gender, class, child labor, equity, livestock presence, etc."

The concept and functioning

Project WAPRO supports the organic basmati rice project that is ongoing since 2011-2012. The organic and fair-trade basmati project grew from less than 200 farmers in 2011 to over 4'500 farmers in 2018. The advantage of building WAPRO on the basmati rice and biogas project, is the visibility of the integrated and sustained impact and benefits. Enhanced capacities of the communities in negotiations and decision making is addressed, through the formation of the Fair Farming Foundation (FFF) with 40% women representation.



FFF is eventually linked to Fair Trade. Information shared with the FFF members percolates to the rest of the villagers.

Every year, fair trade premium for organic basmati rice is received in the FFF account and this amount is used towards development related interventions within the project villages that benefit the whole community. For this, each WEG identifies water and agriculture related issues from within their village to be addressed on a priority basis. This is shared with the FFF members and the NBF representatives during their meetings. FFF meetings are held once every month. Proposals are put forth and the feasibility of these discussed, following which the FFF members prioritize the activities to be cofunded through the premium amount. Additional funds if needed are sourced through other funders by the IC team.

The positive element

- Farms are shifting to a more sustainable system where crop diversification is promoted and use of compost and cow dung is being encouraged.
- Organic certification and fair trade certification has placed these farmers on a premium and their produce fetches greater returns
- WET adoption by farmers results in an additional 1rs/kg returns.
- Communities are empowered to identify local issues to be addressed. In some cases, they have tried and negotiated selling price for the basmati rice.
- More new farmers are showing interest in joining the project and the team is gearing to cater to the local needs.

The impact of the project

A fair trade premium is received at the FFF level, the federation that consults with the communities on the development activities that can be carried out with the premium amount that is in the tune of several lakhs.

Based on the community demand, the premium amount has been used towards the following

- Computer centers opened
- Organic Agriculture Servicecenters set up
- Fencing to reduce animal attack done
- Krishi seva Kendra with agriculture implements and machines available on rent
- Installation of solar street lights



In addition, the FFF members are capacitated to be able to find the market price of Basmati from the internet and use that for price negotiation with NBF.

Best Practice 6: WAPRO building on past interventions

WAPRO's approach of Push Pull Policy has been designed keeping in mind the existing captive group under the Basmati rice project. This is a good approach as the communities and the farmers are already seeing the benefits of an earlier intervention and are more likely to respond positively to the new set of activities on water conservation.

The concept and functioning

IC, prior to WAPRO project in 2015, have been working with the farmers under the organic basmati rice project. Under the organic basmati rice project, while the farmers had shifted to an organic process, water and diversified cropping were not issues that were in focus. They had also implemented the Biogas project, where families were encouraged to install Biogas plant as an alternative to women going several kms into the forest area to collect fuel wood and also to generate cooking gas that is smoke free and healthier option for women.

WAPRO project focuses on WET – water efficient techniques, being promoted in the rice fields as well as for other crops in the kharif and rabi season. While SRI, AWD - Alternate wetting and drying and line sowing techniques address improving the water efficiency aspect, intercropping and use of biogas slurry in the composting process are addressing other aspects of diversification of crops and bringing livestock into the farming system.

The positive element

- An integrated resource management approach puts back farm residue and livestock waste (urine and dung), back into the farm land to enhance the land productivity and crop quality.
- Water saved is water gained – farmers are able to save water in kharif and that is helping them take a second rabi crop comfortable.
- Physical works such as canal repair, desilting tanks and farm channel repair is improving access to irrigation water.
- Fencing and solar torch is addressing the animal attack threat in the villages. The fencing is encouraging farmers to take up and invest in project activities as there is a better chance of getting a good yield, with the fencing in place.



The impact of the project

Studies carried out on established demonstrations, in 2017 show that 23-25% water saving is observed through techniques like System of Rice Intensification and Alternate Wetting and Drying, and crop productivity was enhanced by 20 %.

Using 19, 23, 22 and 24% less water in Chickpea, Lentils, vegetables and wheat, 55, 39, 11 and 23% more productivity was recorded in respective crops of treated plots (Source: IC material).



CHALLENGES & RECOMMENDATIONS

Challenges & Recommendations

Challenges

WAPRO project in its first phase has been successful in building on the existing projects of IC and create a positive awareness and adoption of water efficiency practices within the project beneficiaries. With these benefits, there exists challenges at the project, field and policy levels that we look at in this section.

- A major challenge has been to convince farmers to adopt WET practices. Theoretical explanation of the benefits of adoption does not convince farmers. There is a need to demonstrate the approach and for them to see the benefits of the technology adoption. This is a challenge for the IC team, as the farmers have to be shown through a clear scientific research, the benefits of adoption against a conventional approach of water use, through a longer period of time.
- Currently the WAPRO activities are restricted to the organic basmati rice growing farmers. This was the initial stage of building on existing programs, but as water resource is an issue for all farmers, irrespective of the crop grown, there is a need to bring all farmers within the WAPRO project, irrespective of them not being organic basmati rice cultivators currently – as they are still benefiting from the activities undertaken by the WEGs. WAPRO's impact in the region will be more visible with this inclusion.

JalSakhi's as a concept has been a great success under the WAPRO project. They cover a large area and some travel up to 25 kms to visit project villages. For some, this includes passing through forest areas with poor or no public transport facilities, results in them having to walk the distance many a times. The forest routes can be unsafe and prone to animal attacks.

- The Jalsakhis are developing their own strategies to work around the issue. Kamla Devi, a Jalsakhi plans her visit to far off villages to coincide with the Jaivik mitra's travel, so that she can travel in his vehicle. Another Jalsakhi Ganga, is accompanied by her father on such long distance travel and mentioned proudly that he is now an unofficial "JalSakha". But this is a challenge for the project to address.
- WAPRO has successfully demonstrated how WEG / Jalsakhi's / Pradhan, can link up with the gram panchayat and government departments, and leverage funds for carrying out the infrastructure works identified through the WS plans of the village. This process of submitting the WS plan to the relevant departments and getting them to work on the issue needs to be institutionalized. For this bringing the line departments within the WEG structure and acknowledging the WEG as a peoples institution, needs to take place.
- Interdepartmental involvement in the water works is a challenge in the region. For works related to canal repair and laying new canals, in addition to working with the gram panchayat, the community has to get a NOC (No objection certificate) from the irrigation department and in some cases from the forest department as well. This arises when the land where canal repair work is to be carried out belongs to the forest department. Working with the departments can be a challenge and the program needs to address the collaboration at the district and state level.
- Market link for organic basmati rice has been well established but this is not the case with other farm produce such as wheat, soyabean, pulses and vegetables. Cultivation of pulses is mostly organic in nature and can be promoted for its nutritional value as well in the international market. With the farmers having concerns about lower production when shifting to organic cultivation practices for wheat and other crops, there is a need for the project to address these while creating a market for organic wheat in the national as well as the international. There is a challenge in linking these products with the market and ensure sufficient production to make the venture economically viable as well.
- Weak 'Pull' factor: Incentive to farmers for adopting water efficient basmati rice production approach has not shown positive results. There is a need to identify alternative approach within the 'Pull' factor to

create an interest within the community to adopt water efficient technology. This is a challenge that needs to be addressed.

Recommendations

In the previous section, various challenges have been identified within the WAPRO phase I. There is a need to address them to facilitate growth and improvement within WAPRO phase II, with greater participation and visibility in terms of adoption of WETs, resource management, increase production, productivity and income, etc. As part of this study, respondents were asked to identify areas and activities to improve within the project, so as to improve outputs. In the following paragraphs, we have put together our recommendations as well as their views.

Village institutions

- The model of village institution within the project is well thought of. In the initial stage getting the rice project farmers into WAPRO was good. But now, there is a need to bring in non-beneficiaries from the project villages into the project fold. This was expressed by the project beneficiaries as well. This not only benefits the other farmers, but also the village gains through increase in Fair Trade premium amount gain from additional organic basmati rice sold through NBF.
- To get more farmers to adopt WET, a more practical level training on water technologies is required and the long term benefits of these technologies should be explained to them. This will give them more confidence to adopt the technologies and carry forward the activities beyond the project duration.
- Farmers expressed the need for a panel of experts to advice on crop diseases/pests management while updating their knowledge periodically regarding newer technologies and practices. An app based interactive tool can be looked into for this.
- WAPRO phase I impact on women farmers has been very positive. With increased awareness, skills and capacities, women are expressing interest to take up income generation activities as a collective. Training in food processing and other identified livelihood options emerging from local needs and utilizing local resources to be explored. Existing government schemes supporting such interventions can be explored.
- Interventions have been undertaken at varied scale under all the WEGs. In some places, while WEGs has been established, work undertaken is limited. Continuous activities need to be executed to ensure continued farmer involvement.
- Irrigation water availability is a growing concern that needs attention. Need for tubewells to ensure timely irrigation was proposed.

Policy

- While the Jalsakhi's feedback on interaction with government department staff, has been positive, the involvement of the government departments in the project has been very limited. Strengthening line department's role and involvement is essential and needs to be looked into for the project approach to be incorporated within the policies.
- The gram pradhans in several project areas have played a positive role and to capture this advantage, WAPRO could approach the Panchayat Raj Institution (PRI) at the district level and build capacities and awareness of the pradhans through district level intervention. This will lead to the percolation of project approach and ideas, ensuring greater support and response at the field level to the Jalsakhis visits and initiatives.
- To address the challenges faced due to interdepartmental involvement in the water works, a district level WEG federation can be formed, which can hold regular meetings and invite participation of various departments so as to update them and work in synergy with them.

Market link

- Farmers growing organic basmati are getting very good market returns through the Organic Basmati rice project buy back through NBF. In spite of this, a section of farmers expressed concern regarding rice price and felt the need for better purchase price of Basmati rice.
- There is a need to explore market options both nationally as well as internationally for other farm produce such as wheat, soyabean, pulses and vegetables (babycorn, onion, tomato).
- Setting up processing plants and cold storage facilities for certain produce with short shelf life, will help the farming community increase their income and reduce their losses. Tomato is one vegetable that is produced in big quantities and women expressed interest in setting up a processing plant for tomatoes.
- Cultivation of pulses is mostly organic in nature and can be promoted for its nutritional value as well in the international market. The challenge of linking these products with the market and ensure sufficient production to make the venture economically viable needs to be addressed collectively with the farmers.

Project related

- Jalsakhis have emerged as the core strength from WAPRO phase I. There is a strong drive within them and this comes across clearly while interacting with them. There is a need to retain that spirit through constant upgrading of their knowledge, skills and capacities and offering them better opportunities within the project and organisation.
- Training on new techniques, skill enhancement in use of tabs for documentation and involving them in the process of women income generation options are some areas their capacities can be built. Need to strengthen English language skills was their felt need.
- Currently the WAPRO network for the project is strong, though there will always be scope to improve and expand networking and increase project visibility beyond the state so as to increase replicability of the WAPRO approach.
- A concurrent monitoring and evaluation system will help in strengthening the system and systematic documentation of the project achievements/ impact/ approaches. The documentation will facilitate policy level absorption, further expansion. This will be useful in showing benefits to participating farmers as well as to those who are yet to join the program, as a tool to overcome the challenge of convince farmers about the benefits of adopting WET.
- WAPRO is promoting WET only among the organic basmati rice cultivators. While this approach works as an entry within the community with new technology, for the success of the project, there is a need to involve the other farmers under the WET initiative as though they are nor organic basmati rice cultivators, they still benefit from WEG undertaken activities. WAPRO's impact in the region will gain greater visibility with this inclusion.
- JalSakhi's as a concept is a great success under WAPRO. Their presence at the village and being practicing farmers themselves is a clear advantage. There is a need to strengthen their knowledge and skill so they can take on greater responsibility as the project grows. Networking with other players in the sector will help them be of greater value within the system. They can be instrumental in strengthening the link with the panchayat and line departments, with data and documentation support provided from the project.
- Incentive to farmers for adopting water efficient technologies has shown limited results. An alternative approach within the 'Pull' factor could be to link the products of the farmers who have adopted WET with the market / processing units. This will create a clear increase in income for the farmers to adopt WET.



Checklist for FGDs and Individual Interviews- WAPRO project

Individual Interviews-

1. Project beneficiaries

1. Name: _____ Gender: M/F Age: _____
2. Land owned (If fragmented, what is area of each fragment?) (In Nali)(3 Nali = 1 bhiga): _____
3. Irrigation source & medium:

Before 2015		Now (2018)	
Source	Medium	Source	Medium

4. Farming practices carried out in your farm:

Before 2015	Now (2018)

5. Farming duration/ yr, number of crops / yr and Crops / season

Number of crops / yr		Crops / season			
Before 2015	Now (2018)	Before 2015		Now (2018)	
		Kharif	Rabi	Kharif	Rabi

6. Months when organic farming is being practiced _____
7. Do you practice organic farming in all the land owned you? _____
8. Water efficiency techniques adopted: _____
9. Changes pre and post project intervention _____

	Before 2015	After 2015
Productivity (bags/bhiga)		
Input cost (Rs/bhiga)		
Output cost (Rs/bag)		
Quality of soil before and after 2015		
Ease of access to market/sale of produce		
Annual Income from agriculture		

10. Are there any other external factors that have played a role in the change in the above-mentioned parameters? (Climatic variations, subsidies from government, others) _____
11. Have there been any changes in the gender equations post 2015? If yes, what are the changes?

- Work allocation
- Decision making
- Cash transactions

- Knowledge levels

12. Changes in knowledge and skills of farming

To be filled ¹	Y/N	If yes, in what way? ²

13. Have you attended trainings/workshops/exposure visits/ on-farm demonstrations? If yes, give details?

Sl. No	Trainings	Workshops	Exposure visits	On field demo

14. What challenges (if any) do you face in selling your product to buyers?

Sl. No	Before 2015	Now (2018)

15. Have the identified interventions in the project been fulfilled to your expectation level? If no, what are the gaps?

16. What are your future expectations (support you wish to receive) from the project?

17. Will this project sustain beyond the intervention of funders? What additional support do you envisage to reach this point?

18. How is your relation with the WEG? How do they help you?

19. How is your relation with the NBF support staff? How do they help you?

20. How is your relation with Jalsakhi? How do they help you?

21. What was the motivation for you to join the WEG?

22. Have you seen an increase in income through the project interventions? How do you utilize the additional revenue generated?

23. Do you save time in you daily activities due to the project interventions? How much time do you save on an average? How do you spend the free time earned?

Time spent on field activities before 2015	Time spent on field activities now (2018)

24. Mention some of the local practices that have emerged during this project period – to prevent pest attack and other related activities.

¹ Will be filled based on the answers for Q7 and Q8

² 1: knowledge has increased; 2: skills developed to implement on farm; 3: able to demonstrate and train others

2. Jalsakhis

1. Year of joining the WAPRO team
2. What has inspired you to join as Jalsakhi
3. On what aspects have you received training /exposure visits from or under the Project?
4. In how many villages have you conducted the mobilization activity? How successful have they been?
5. How often do you organize meetings with WEG members?
6. What have been the major achievements of the project so far?
7. What challenges do you face on ground while carrying out project related activities such as mobilization/ demonstration? (travel related)
8. What have been the benefits for you through association with WAPRO?
9. What are your suggestions to improve the program and strengthen the WEGs?
10. Has being Jalsakhi changed your social status within the communities?
11. How do you approach the government officials and how is their response to you as a Jalsakhi?
12. Do you consult the NBF and Fair Trade team members? If yes, for what?
13. What is the most satisfactory aspect of your involvement as Jalsakhi?
14. What challenges do you face in bringing women into the WEGs?
15. Were you involved in the baseline survey? What change do you perceive from then till now?
16. How has been the WAPRO team support through the project?
17. Do you feel you require training in any aspect of the project to be better equipped to implement the project?

3. Gram Panchayat (Pradhan)

1. What do you think of the WAPRO project?
2. Are you part of the WEG? What role do you play in it?
3. What benefits do you see coming in for the village through the WAPRO project?
4. Have you personally adopted water conservation /SRI organic rice cultivation /biogas?
5. How do you see NBF role in your village?
6. What have been the major changes in farming in the last 3 years? (water saving / cropping pattern)
7. What were your expectations from the project and are they being met?
8. What are the expectations in the coming years?
9. What has this project experience given you in terms of water planning for the village as a Pradhan? (15-20 yrs)
10. How do you go about the implementation of the action plan?
11. Submission of water stewardship plans to the government?

4. NBF

1. What is the process of procurement?
2. What is the process of certification?
3. How is the cost of the product determined?
4. Trainings if any being provided to the farmers
5. Any monitoring visits made to the villages
6. What is the quality control approach?
7. What are the issues (if any) faced in the ground with respect to certification and procurement?
8. What are your strategies to address the challenges that exist or foreseen in the future?

9. Do you see scope in expanding the procurement to other produce grown in the region?
10. What is the approach for identifying farmers / farming practices / certification / procurement /transportation from source to market?

Project area	Approach
Identifying farmers	
Farming practices	
Certification	
Procurement	
Transportation from source to market	

11. On what aspects do you interact with the following groups?

Groups	Interaction
Beneficiaries	
Government officials	
WEG	
Jalsakhis	
WAPRO	
Jaivik Mitra	

12. Other than the WAPRO villages, do you have association with other villages as well? If yes, what is the process followed with these other villages?
13. What is the issue with adding newer farmers into the ICS (internal control system)?

5. Govt officers of Agriculture and Irrigation Dept, and also Pant nagar University professor (telephonic)

Agriculture Department

1. Is the concerned official aware about this project?
2. Whether project people approached the department before interventions to discuss about plan and take suggestions from officials?
3. From your perspective if/how the project benefitted rice cultivators.
4. Is there any improvement in seed quality after organic farming introduction in the area?
5. How is the soil quality before and after the interventions? Has soil test been carried out in these villages?
6. Do you see a role of the department in expanding the project to adjacent villages/districts?
7. Will these practices be mainstreamed into policy? What are the limitations?
8. Your suggestions to improve the project in future.
9. How water related activities has changed the condition of the villages?
10. How soil moisture conservation practices has changed the condition of the villages?
11. What are the technical support extended to the project villages?
12. Are there any market links /subsidies / schemes available for these farmers?
13. Are there any projects sanctioned to these villages?

Irrigation Department

1. Is the concerned official aware about this project?
2. Whether project people approached to the department before interventions to discuss about plan (canal repairing /laying new channels) and take suggestions from officials?

3. What is the role you have in issuing the NOC to the villages –where applicable?
4. From your perspective if/how the project benefitted rice cultivators.
5. Under the project, water distribution infrastructure of the area was repaired and extended to a certain extent. Has it benefitted the crop fields and how?
6. If not then what are the possible suggestions to improve it?
7. Do you see a role of the department in expanding the project to adjacent villages/districts?
8. In general is there any improvement in ground water levels after farmers adopted water conservation techniques?
9. How water stewardship plan has changed the condition of the villages?
10. Will these practices be mainstreamed into policy? What are the limitations?
11. Are there any market links /subsidies / schemes available for these farmers?
12. What are the technical support extended to the project villages?
13. Are there any projects sanctioned to these villages?
14. Your suggestions to improve the project in future.

Pantnagar University

1. What is your thoughts about the WAPRO project?
2. Have you been part of any consultation/ training/ assessment etc., process under project? If yes, provide details.
3. What is the impact of the project on the water conservation, groundwater table enhancement and on agricultural productivity in the region?
4. What is the scope for expansion of this intervention in the region?
5. Do you see gaps in the project implementation with respect to sustainability?
6. What kind of research are carried out on the following topics?
7. Do you conduct crop demo, promote cropping practices, seed conservation & multiplication practices, etc.
8. What are the participatory technology developed under these project? (Water conservation/ carbon emission neutralization/ soil moisture technology)
9. What are your recommendations for sustainability and expansion of the project?

6. Private market players/ earlier buyers

1. Are you aware about the project interventions?
2. What is your understanding about the project?
3. Is there any impact on produce supply from farmers and your sales to retailer due to the project?
4. Has the project resulted in any significant changes in your business in terms of profit or loss? What are your strategies to counter any loss incurred?
5. What is the process of negotiation with the farmers?
6. How do you fix the price of produce?
7. What is the process adopted for procuring and selling the produce?
8. What kind of challenges are you facing because of project?
9. Do you feel the need to get involved with the project to improve your business?

7. Local fertilizer and chemical shop persons (one or two) for understanding the change in their business

1. Are you aware about the project interventions?
2. What is your understanding about the project?
3. What kind of challenges are you facing because of project?
4. Has the project resulted in any significant change in your business in terms of profit or loss? What are your strategies to counter any loss incurred?
5. In case of experiencing loss in business would they still promote organic farming?

List of people for Individual Interviews				
Beneficiaries				
No	Name	Gender	Place	date
1	Bimala Bajwal	F	Ginti Gaon	8-Jan-19
2	Deepa Bhandari	F	Ginti Gaon	8-Jan-19
3	Kuber Singh	M	Ginti Gaon	8-Jan-19
4	B.S. Bajwal	M	Ginti Gaon	8-Jan-19
5	Bhuwan Chand	M	Ginti Gaon	8-Jan-19
6	Kirti Ballabh	M	Mallisetty	9-Jan-19
7	Naveen chandra Bhandari	M	Mallisetty	9-Jan-19
8	Kirpal singh	M	Mallisetty	9-Jan-19
9	Asha Tiwari	F	Tiwari Gaon	9-Jan-19
10	Manju Devi	F	Tiwari Gaon	9-Jan-19
11	Anandi Devi	F	Tiwari Gaon	9-Jan-19
12	Bhuwan Chandra	M	Tiwari Gaon	9-Jan-19
13	Manju Devi	F	Dhamola	10-Jan-19
14	Chandra Prakash	M	Dhamola	10-Jan-19
15	Liladhar Sati	M	Dhamola	10-Jan-19
16	Champa Tiwari	F	Patkot	11-Jan-19
17	Naveen Cahndra Tiwari	M	Patkot	11-Jan-19
18	Kavitha	F	Patkot	11-Jan-19
19	Damodar Tiwari	M	Patkot	11-Jan-19
20	Bipin Chandra Sati	M	Kyari Gaon	14-Jan-19
21	Poorma Singh Rawat	M	Kyari Gaon	14-Jan-19
22	Geeta Bohra	F	Kyari Gaon	14-Jan-19
Jalsakhis				
1	Seema Tiwari		Betalghat	9-Jan-19
2	Janaki Sati		Dhamola	10-Jan-19
3	Renu Tiwari		Patkot	11-Jan-19
4	Anjali Bajwal		Kotabagh	8-Jan-19
5	Kala Devi			8-Jan-19
6	Geetha		Ginti Gaon	8-Jan-19
7	Ganga Devi			14-Jan-19
Gram Pradhan				
1	Harikishan		Mallisetti	9-Jan-19
2	Rani Devi		Dhamola	10-Jan-19
3	Ambeer Chand		Bail Padao	11-Jan-19
4	Dinesh Chandra sethi & kavitha sethi		Kyari Gaon	14-Jan-19
FFF Officer				
1	Pavitra Mohan Nath		Ginti Gaon	8-Jan-19
Agriculture Development Officer - Betalghat				
1	A K Mittal		Telephonic interview	8-Jan-19
Nature Bio Foods (NBF)				
1	Ashish Srivastava		Haldwani	12-Jan-19
Pantnagar University				
1	Dr D K Singh		Pantnagar	12-Jan-19
Owner- Abhay Enterprises Chemical fertilizer shop				
1	Ajay Tiwari		Bail Padao	14-Jan-19

FGD

1. Water and Environment Groups (WEGs)

- a. Process of formation of WEGs
- b. How were water saving techniques and practices identified and adopted in the village?
- c. How were organic farming practices identified and adopted in the village?
- d. What is the support that WAPRO has provided so far? (training, infrastructure and others)
- e. What have been the major changes in farming in the last 3 years? Have the project interventions benefitted, if yes in what way?
- f. What have been the expectations from the program and are these expectations being met?
- g. What are the expectations from the project in the coming years?
- h. Has the community interaction evolved as a result of WEG formation? How?
- i. Impact of project initiatives on personal relations between beneficiaries and non-beneficiaries.
- j. What are the inputs you received from the Jalsakhis'? Did they add value to your work?
- k. What are the inputs you received from NBF? Did they add value to your work?
- l. What are the inputs you received from the Jaivik mitra on organic farming/pest control? Did they add value to your work?
- m. Do you compare rates quoted by NBF with those of the private buyers?
- n. What are the benefits from training on their confidence level and over all personality?
- o. What impact did the trainings have on your WEG activities?
- p. Did you go for exposure visits? If yes, give details and how they helped you?
- q. What records do the WEG maintain?
- r. What are the financial processes followed for the interventions?
- s. Is there a rotation for WEG members? What is the term of each member?
- t. What is the reporting format followed? Who is responsible for the reporting?
- u. Has there been an improvement in the women's decision making and in their socio-economic status after joining WEG?
- v. WEG's involvement in biogas maintenance – What training have the WEG members received on this?
- w. Are you confident about taking over the biogas maintenance and servicing in your village?
- x. What is the women's presence in WEG?

2. FFF (Fair Farmers Foundation)

- a. Process of formation of FFFs
- b. What benefits do you gain from being part of the FFF?
- c. How often do you meet and what are the general discussion points?
- d. What inputs do you receive from NBF as part of FFF? How has that benefited you?
- e. What is the support that NBF has provided so far? (training, infrastructure and others)
- f. What were your expectations from FFF and are they being met?
- g. What are the expectations from FFF in the coming years?
- h. Has the community interaction evolved as a result of FFF formation? How?
- i. How is your working relation with jaivik mitra?
- j. Do you compare rates quoted by NBF with those of the private buyers?
- k. Did you go for any exposure visit? If yes, how has exposure visits help you?
- l. What records do the FFF maintain?
- m. What are the financial processes followed for the interventions?
- n. What are the norms / criteria followed to become a FFF member?

- o. Are FFF members also WEG members?
- p. What is the reporting format followed? Who is responsible for the reporting?
- q. How many men and how many women are there in the FFF?
- r. What is the price negotiation process followed with NEB?

3. Non beneficiaries

- a. Are you aware of the WAPRO project? What components of the project are you aware of?
- b. What do you think of the project? Do you think there are benefits within the project?
- c. Is there anything about the project are you not comfortable about?
- d. Why did you not join the project when it was launched?
- e. Are you interested in joining the project now?
- f. Are the water conservation and water saving techniques and practices followed by the project farmers benefiting you as well?
- g. Is the organic farming practices adopted in the village beneficial with you?
- h. What support have you got from WAPRO? (training, infrastructure and others)
- i. What have been the major changes in farming in the last 3 years?
- j. Impact of project initiatives on personal relations between beneficiaries and non-beneficiaries.
- k. Do you receive inputs informally from the Jalsakhis'? Did they add value to your work?
- l. Has the NBF staff approached you regarding your joining the project?
- m. Do you compare rates quoted you get with that offered by NBF to the project farmers?

List of people for Focus Group Discussion- WEG					
Place	Mallisetti	Place	Dhamola	Place	Kyari gaon
Date	9-Jan-19	Date	10-Jan-19	Date	14-Jan-19
WEG Members	Role	WEG Members	Role	WEG Members	Role
Kirti ballabh	President	Janaki sati	Vice President	Dinesh Chand	President
Mohan singh	Vice President	Chand prakash budlakoti	Secretary & Vice Pradhan	Heera Singh	Accountant
Kushal singh bhandari	Secretary / FFF representative	Leeladhar sati	Treasurer	Narayan Dutt	Secretary
Nandan Singh	Member	Suresh Chandra pandey	Member	Govind Singh	Member
Hari devi	Member	Bhuwan chandra sati	Member	Chandan Singh	Member
Hari kishan	Member	Geeta bisht	Member	Bhuwan Chandra	Member
		Shekar Chandra sati	Member	Neema Sati	Member
		Chandra sekhar Pandey	Member	Tara Devi	Member
		Ganesh datt sati	Member	Khayli Dutt	Member
		Pramod sati	Member	Mahesh Chandra	Member
		Bhavita sati	Member	Bhuwan Chandra Belval	Member
		Dhamayanthi kulara	Member	Puran Singh Rawat	Member
		Bhawna sati	Member	Geeta Bora	Member
			Member	Champa Rawat	Member
				Manju Nahlwal	Member

FGD- Non Beneficiaries	FGD- FFF
Place: Dhamola	Place: Patkot
Date : 10 January 2019	Date : 11 January 2019
Jagdish sati	Mohan Chandra Tiwari
Gopal das sati	Naveen Chandra Tiwari
Gokul	
Yogesh pandey	

Group Interview with WAPRO project team based in Haldwani-

WAPRO Team (Dhiren, Jyothsna and Sawan)

1. What are the major achievements of the project?
2. Were the achievements part of the project strategy and expected from the beginning or were they due to modifications during the project?
3. What are the criteria's adopted for identification of villages and beneficiaries?
4. What are the major challenges faced during the project implementation
 - i. Convincing farmers to adopt water efficiency techniques and organic farming
 - ii. Government officials for their approval regarding repair and development of water infrastructure.
 - iii. Resistance from former private buyers
5. How are the linkages with the government departments? How is the technical and other support extended to the project area obtained?
6. What are the various motivational factors during implementation?
7. What are the factors that you feel need to be focused on during upscaling?
8. What are the training and communication materials developed and being used?
9. How are the water stewardship plans developed and promoted in the villages?
10. How are contractors/vendors identified for the implementations in the villages?
11. What are the monitoring process (formats designed) for various stakeholders?
12. What kind of trainings and exposure have been provided to the WAPRO staff, Jalsakhis, beneficiary farmers, non-beneficiary farmers, etc?
13. What have been your learnings from the project implementation?
14. Are there any linked issues that you feel the need to address in the project area, that have direct bearing on the success on the project?
15. Regarding the sustainability of the project on a long term basis – including the jalsakhis, what are your plans?