SUSTAINABLE WATER RESOURCES MANAGEMENT APPROACHES TO EFFECTIVELY ADDRESS ADAPTATION TO CLIMATE CHANGE IN VILLAGES OF JHARKHAND



Study Conducted by

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Action For Food Production

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Abbreviations

AFPRO	: Action for Food Production
BAU	: Birsa Agriculture University
b.g.l.	: below ground level
CBO	: Community Based Organization
IINRG	: Indian Institute of natural Resins and Gums
IWP	: India Water partnership
JSP	: Jan Seva Parishad
MV	: Manav Vikas
NGO	: Non-Government Organization
PVP	: Photovoltaic Water Pumps
SJVK	: Samekit Jan Vikas Kendra
SPWD	: Society for Promotion of Wastelands Development
SRI	: System of Rice Intensification
WVI	: World Vision India

Report on

Sustainable Water Resources Management approaches to effectively address adaptation to Climate Change in villages of Jharkhand

Executive Summary

Proper water resources management in a sustainable manner is one of the most crucial issues for achieving food production demands and hence food security. This is more important now as climate change is posing to be a major threat for hydrological regimes and available freshwater resources, which will impact both rain-fed and irrigated agriculture. Thus, water use efficiency is necessary for ensuring agricultural sustainability in the future. Despite huge investments by Government in water sector, efficient water resource management at community level is still a challenge. In this situation, region specific water saving technologies need to be promoted for judicious use of water resources.

In many parts of the country, communities have developed low cost water saving technologies for irrigation and water conservation. These techniques are based on the local requirement and replicable in similar agro-climatic regions.

Jharkhand is most vulnerable to climatic variations because of the heavy reliance on rain-fed agriculture, the poor level of water control and the poor replenishment of reservoirs. In such situation, water for irrigation as well as drinking purposes requires to be managed efficiently. AFPRO partnered with IWP made an effort to find out community practiced water saving technologies from the villages of Jharkhand State.

The project, initiated in February 2011, designed to document best practices and sensitize communities/ NGOs/ CBOs on affordable water technologies and water conservation. Till July 2011, AFPRO collected 11 cases from the field and documented on following water saving techniques, practiced by rural communities of Jharkhand. The detailed case studies are presented in Annexue-1, 2 and 3. These low-cost techniques are efficient and having great potential for wider replication, where water resources are limited and agriculture is pre-dominantly rain-fed.

In the month of August 2011 a dissemination workshop was organized to sensitize Communities, NGOs, CBOs and Government in Godda District of Jharkhand. Report of the Workshop Report is attached in Annexue-4. A similar workshop was organized in the month of September 2011 in Hazaribag District. Report of the Workshop Report is attached in Annexue-5.

A one-day State Level Workshop was organized on 'Water Harvesting and Conservation – An Affordable Water Technologies and Best Practices' organised by Action for Food Production (AFPRO) with the support of India Water Partnership (IWP). The aim of the workshop to sensitize Government and developmental professional to incorporate such techniques in the ongoing programme/ project as well as to policy adovocay at State level. The detailed report of the workshop is attached in Annexure-6.

Jharkhand is adversly affected by the impact of climate variations, as the region faces significant variation in rainfall over past several years. This variation resulted in lowering of ground water and limited avaliablity of water for agricultural and drinking purpose in summer season. Government and other developmental agecncies came forward to address the issues relating to resolve water scarity of the State.

In such condition jucicously management of water gets importance and a need arises to promote low cost water saving techniques at local level as a adaptation measure to climate change. AFPRO partnering with IWP collected community practised low cost water saving techniques from diffferent regions of Jharkhand that helped in sensitizing local communities, developmental agencies and government officials on the need to adaption of such techniques at larger level. There are many techiques collected during the project such as Rooftop Rainwater Harvesting, System of Rice Intensification (SRI) Cultivation, Earthen Check Dams, Drip Irrigation System, Gravity Flow Irrigation System, Well Irrigation, Photovoltaic Water Pumps (PVP), etc. having great potential to address better and sustainable management of water resources in water stress condition, as an adaption to impending climate change in the rural villages of Jharkhand.

ANNEXURE -1



Case studies on water savings and water harvesting technologies adopted in villages of Jharkhand

Summary

This document contains five case studies of different water savings and water harvesting technologies adopted by people of Jharkhand covering Hazaribag, East Singhbhum, Latehar, Ranchi districts. These case studies are developed by **AFPRO** after the visit of project area and interaction with beneficiaries. The studies provide insights on appropriate technological options, process followed for execution and lessons that can be drawn for replication. Following are the case studies.

Case Study - 1

Ground Water Recharge through Rooftop Rainwater Harvesting – Improving Source Sustainability

Introduction

Established in 1914, St. Albert's College is located in heart of Ranchi City of Jharkhand. The infrastructure of the college includes nine class rooms, three computer rooms, a library and an auditorium with a sitting capacity of 500 people. The residential college accommodates 162 students and providing facilities like reading & TV rooms, hockey football & basketball grounds and volleyball & badminton courts for co-curricular activities.

Jharkhand is facing serious water scarcity especially during summer. The urban cities are not even untouched with the problem. The increasing dependency of ground water, as surface water unable to meet the drinking water needs of urban cities, resulted in over exploitation of ground water. Ground water is a limited resource and it has been well recognized by management of St. Albert's Collage. In 2006, the management of the collage came forward to construct Rooftop Rainwater Harvesting for minimizing the water shortage as well as recharging the ground water aquifers.

Problem Statements

- Scarcity of drinking water in summer season.
- Low ground water recharging due to soil characteristics.

Objectives of the Intervention

- To minimize the water shortage problem by ground water recharging.
- To improve the ground water level in project area.

Salient features:

Name of college	**St. Albert's college**
Place	Ranchi, Jharkhand
Technology adopted	Rooftop rainwater harvesting & ground water recharging
Number of beneficiaries	400 students & staff
Average annual rainfall	1100 mm
Available roof area	6820.53 sq.mtrs
Number of recharging unit	7
Year of implementation	2006
Total cost of the seven recharging units	Rs.137207
Duration in which water scarcity occur	2 months (60 days)
Operation and maintenance	By beneficiaries
Implementing Agency	AFPRO, Field Unit IV
Total quantity of water stored	7502583 Litres
Cost of 1000 Liters water	Rs. 18.28

Description of the structure:

Total seven recharging units have been constructed spreading in different locations in the institution with the aim to cover maximum area for recharging aquifers. The dimension of each recharging unit is kept 3.65 Mtrs diameter and 3.04 Mtrs depth. The roof top rainwater diverted to recharging unit that percolate into ground and restore the water table of the area.

Recharging unit constructed in St. Albert College, Ranchi

Impact of artificial recharge on local ground water system:

Recharging structures are constructed to harness the natural surface water runoff to recharge the ground water and solve drinking water needs in summer. The recharge structure also supports in increasing yield capacity of the existing water source like wells and pond present in the area.

Before implementation of the project, water level in wells and pond was lowering down with year but now even in the summer sufficient water is available in the pond and well as well. During the interaction with the staffs and students of the institutions, AFPRO team found that students and staffs are not facing drinking water crisis in summer and they grows vegetables from the extra water in the backyard. The overall water level of the area has also been increased as indicated by the staffs of the institutions. Earlier rain water was flowing outside the campus, creating unhygienic environment. But, after construction of recharge structures, the flow direction spreads to all the surrounding areas that enhanced the soil moisture condition.

Case - 2

System of Rice Intensification (SRI) Cultivation: More Rice with Less Water

Background:

In this village of Turkatanr of Latehar district, paddy is cultivated by adopting SRI method in 2.8 acre land. Mennonite Christian Service Fellowship of India (MCSFI), a grass-root NGO working in this village promoted the concept of SRI among the farmers. Initially, ten families were involved in this project aiming to enhance food production in the area by promoting improve agricultural practices.

In the beginning of the project, implementing agency MCSFI designed a strategy to ensure success and sustainability of project. The activities included detailed Participatory Rural Appraisal (PRA), door-to-door survey for baseline data collection, identification & sharing of the modalities of activities and meetings & interactions with the community to build up rapport. The community, beneficiaries and other stakeholders were informed about the progress of the projects, the problem areas and the different remedial measures taken from time to time. Capacity of the community and NGO personnel was built up through practical trainings so as to facilitate easy learning by the community along with monitoring of activities.

Objective:

To enhance agricultural extension capacity of the farmers to establish best practices, improved crop production technique and sustainable ways of cultivation.

Salient features:

Location	**Turkatar Village, Balumath Block, Latehar District**
Technology adopted	SRI Cultivation
Project status	Successful
Activity involved	Capacity building by training
Area covered	2.80 Acre
Number of beneficiaries	10 Families
Project Duration	1st April 2010 to 30th September 2010
Implementing Agency	Mennonite Christian Service Fellowship of India (MCSFI)
Role of AFPRO	Impact assessment of the project

Impact:

The training imparted on SRI has turned into practice of new method of Rice cultivation by the farmers. The community has collected the information regarding the produce of the paddy using the SRI system. On an average, the yield of paddy has been 2 to 3 times more than the normal method. Looking at the success of SRI cultivation Mr.Karamchand one of the beneficiaries expressed “next year onwards the whole village will take up paddy cultivation using the SRI method”.

Paddy was planted in 2.80 acres of land in Turkatanr village as demonstration of SRI method. At the end of the project, a comparative study of previous year input and output with the project year (2010) was carried out. The findings are tabulated as follows.

	Year 2009	Year 2010	Difference
INPUT			
	Per unit cost (Rs.)	***Per unit cost (Rs.)***	
Seed	150.00	6.00	25 times less
Labour	100.00	100.00	
Fertilizer	100.00	75.00	
Irrigation	100.00	100.00	
Total input	450.00	281.00	1.6 times less
OUTPUT			
	Kg. / acre	***Kg. / acre***	
	221	710	3 times more

The year 2010 has been a drought year and the crop production was severely affected. Despite that the farmers were able to take paddy because of the new technique learnt i.e. SRI. The paddy cultivation by the traditional method has totally failed due to the drought. The farmers from the neighboring villages also noticed better yield by using SRI and it is expected that they would also adopt it in the next cropping season.

Since project area is drought prone and average land holding is 1.46 acre, SRI cultivation is Promising way to produce more rice with less water. The result shows that SRI techniques can bring positive changes in the life of villagers and definitely enhance food security by increasing production and further enhancing income.

Case - 3

Increase Storage Capacity of Check dam ensures protective Irrigation

Background:

Dasokhap is a midsized village located in the district of Hazaribag of Jharkhand State. The village has a population of 1295 living in 197 households. Agriculture is main occupation of most of villagers, with limited irrigation facilities. The cultivable land is divided into upland and the lowland. Uplands are suitable for dry crops whereas paddy is grown in low land. Even though the village receives high rainfall, but there is scarcity of water in summer season.

In the project area an earthen dam already existed which was being used for irrigation purpose. The dam had very low storage capacity i.e. 100x100x3m^3. Runoff water being stored in this storage area was not found sufficient to meet crop water need in all the villages. The villagers came forward with a request to increase the storage capacity of the dam. In spite of increasing the depth, **AFPRO** went for an innovative solution by raising the level of existing inlet/outlet of the dam by 1m and also provided a separate inlet to divert water towards the dam.

Separate Inlet for diversion of water

Picture showing the raised spillway

Objective:

- To improve water storage capacity of the already existing structure for providing irrigation to the agricultural fields.
- To improve soil moisture in the surrounding area, harvest the surface runoff, reduce soil erosion and increase recharge to ground water.

Salient features:

Location	Dasokhap Village, Churchu Block, Hazaribag
Technology adopted	Check dam
Storage capacity	100mx100mx4m
Project status	Successful
Year of implementation	2010
Area covered	150 acre
Cost of structure	Rs.1.3 lakh
Beneficiaries	ST and OBC
Number of beneficiaries	65
Purpose	Irrigation water
Technical planning	AFPRO
Implementing agency	SUPPORT, Hazaribag
Repair and maintenance	By beneficiaries

Impacts:

After increasing the level of the existing spillway, villagers are getting sufficient amount of water for irrigation purpose. Now they are able to irrigate more than 150 acre of land from the dam. Though paddy is still the dominant kharif (rain fed) crop, wheat and vegetables are now grown as regular irrigated, rabi season crops. This check dam has also improved water level of project area.

Case - 4

Photovoltaic Water Pumps (PVP): Alternative Option for No Electric Zone

Background:

Kanabandh is a small village situated in the Hazaribag district of Jharkhand. The tribal village has 35 Households. Like other tribal villages of Jharkhand, in Kanabandh it was hard to find safe drinking water. In this village most of the villagers don't prefer hand pump water for drinking purpose due to water quality issues. In such case high yield bore well was the only option for the villagers to meet their drinking water needs. Looking at the irregular supply of electricity in the village, an innovative strategy to tap solar energy to run the pump was tested. Solar Photovoltaic Cell opted as an option to ensure drinking water as well as electricity in the village.

Objective:

- To provide safe drinking water to villagers within their vicinity

Salient features:

Location	**Kanabandh Village, Churchu Block, Hazaribag**
Technology adopted	Solar Water Pumping
Number of photovoltaic cells	24
Capacity of tank	1000 Ltr
Capacity of pump	2.5 HP
Depth of boring	350 feet
Year of implementation	2000
Cost	Rs.5,25,000/-
Beneficiaries	Tribal people (ST)
Number of beneficiaries	35 Families
Purpose	Drinking water
Project status	Successful
Implementing agency	Jan Sewa Parisad
Repair and maintenance	By beneficiaries

Description of the structure:

There is one storage tank having capacity of 1000 Litres capacity. Water is lifted with Photovoltaic Water Pump (PVP) and stored in storage tank.

Jan Sewa Parisad, the implementing agency in the village, has not only implemented the Solar Water Pumping system but also trained villagers to repair and maintenance. It was informed by the villagers that the system is functional without any expenses even after 10 years.

The Drinking Water System developed in the village by using Solar Water Pump

Impact:

Solar water pumping system has improved life of tribal people. Whole village is using this water mainly for drinking purpose, other than cooking, bathing and washing cloth & utensils. Waste water is used for kitchen gardening for cultivation of vegetables and fruits.

It is observed that any technology if implemented properly ensure sustainable, reliable and long lasting system. The advantage of Solar Water Pumping system is low operating cost and low maintenance and is most suitable option where irregular supply of electricity persists.

Case - 5

Drip Irrigation system: Potential Water Saving Agricultural Technique

Background:

In present context, effective utilization of water for agricultural production considers very important, as water resource is limited. Government of Jharkhand also emphasizes the need to adopt the water saving techniques for agriculture. Drip irrigation system is regarded as a water saving technology for crop production. It is a method in which water is supplied to crops at "specific point" usually at the base of the plant.

The initiative is taken by Self Help Group (SHG) of project area to adopt Drip Irrigation system with the support of World Vision India. Drip irrigation is mainly adopted by farmer Sita Nath Paul of village Gohala in East Singhbhum district. World Vision India has implemented this project in **one acre** land of Sita Nath Paul as a demonstrative plot.

Objectives:

- To provide irrigation solution by adopting water saving technology.
- To identify the gaps in technical and social acceptability of drip irrigation systems by farmers.

Salient features:

Location	**Village Gohala, Block Musabani, East Singhbhum**
Name of owner	Sita Nath Paul
Technology adopted	Drip irrigation
Main pipe size	200 Ft with 75 mm diameter
Subsidiary pipe size	100 Ft with 60mm diameter
Year of implementation	2008
Area covered	1 acre
Cost of implementation	Rs.50,000
Beneficiaries	Self Help Group (SHG)
Number of beneficiaries	12 member
Crop grown	Vegetables
Project status	Not successful
Implementing agency	World Vision India
Repair and maintenance	By beneficiaries

Description of the structure:

An 8 HP diesel pump is used to lift water from the well. A long pipe of 60.9 Mtrs with 75 mm diameter is used as main pipe and spread in middle of field. From main pipe, small or subsidiary pipe of 30.4 Mtrs long with 60 mm dimension is used to reach the crop root.

Irrigation well

8 HP diesel pump

Main pipe of drip irrigation field

Farmer's vegetable

Impact:

It is quite surprising to see that Sita Nath Paul is not using drip irrigation system for the present vegetable crops. They He is following traditional method of irrigation i.e. flood irrigation for cultivation of crops in spite of availability of drip irrigation pipe in the field. After the interaction with beneficiary It was observed that there are many challenges to adopt drip irrigation system, which are listed below.

- High initial cost.
- Less technical knowledge.
- Extensive maintenance requirement due to clogging of drippers.
- No subsidy provided by government.
- Fear of the failure of system.
- Low level of awareness.

Though the drip irrigation system has been able to save water and simultaneously increase productivity and income from farm activities, but sustainability of this technology is still questionable in the State of Jharkhand.

Conclusions:

Drip irrigation system is new technology in Jharkhand and technical knowledge and skill for adaptation requires for its sustainability. Efforts have been made by different organization and NGOs for successful implementation of drip irrigation system in Jharkhand but success is very limited due to low acceptability among farmers. Study shows that drip irrigation is useful measure of water saving but farmers are not showing confidence in this technology because of lank of knowledge on operation and maintenance.

Lack of proper demonstration and information on operation, maintenance and usefulness is the main reasons behind the low acceptance of a useful water saving techniques.

ANNEXURE -2



Case studies on water savings and water harvesting technologies adopted in villages of Jharkhand

Summary

This document contains 3 case studies of different water savings and water harvesting technologies adopted by people of Jharkhand covering Gumla and Ranchi districts. These case studies are developed by AFPRO after the visit of project area and interaction with beneficiaries. The studies provide insights on appropriate technological options, process followed for execution and lessons that can be drawn for replication. Following are the case studies.

Case Study – 1

Harvest and Conserve Rainwater for Sustainable Ground Water Management

Introduction

After becoming the State capital of Jharkhand, Ranchi suddenly grew like a big city. The population of Ranchi has grown suddenly with high-rise apartments and buildings. This has led to increased pressure on groundwater to fulfill water needs of the rising population. Use of concrete and cement paving everywhere in the city restricts rainwater to percolate into the ground along with over withdrawal of groundwater resulted in fast depletion of groundwater. In summer seasons many of groundwater sources start drying up and people of the city has to look for alternative source. At such situation, water harvesting and conservation measures are required for sustainable groundwater management.

Loreto Convent School, a Catholic institution, is situated in Ranchi city. Looking at the water scarcity of the area, the school management realized the need to recharge groundwater by using defunct sources like wells, bore wells and creating recharging pit in the available areas.

Interventions

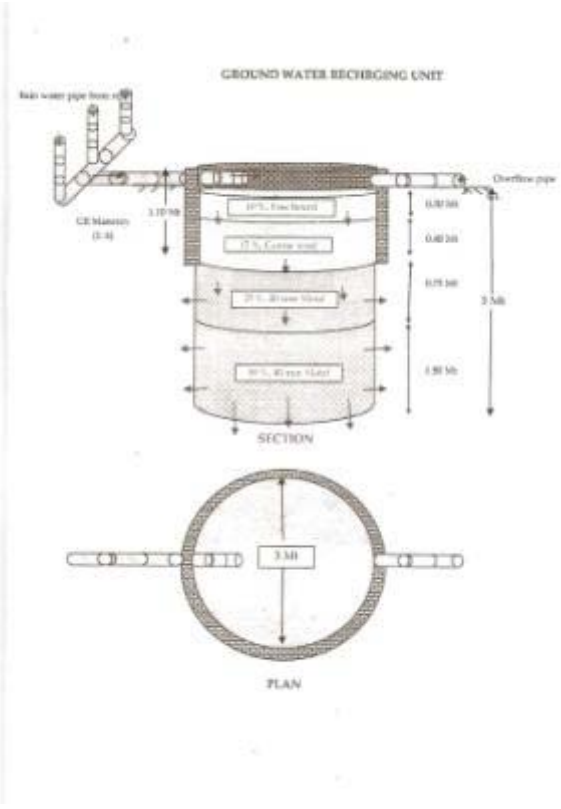
Till 2007, the exiting four wells in the school campus were not functional in the summer season. To overcome the water problem, Principal of Loreto Convent requested AFPRO to provide technical support in developing ground water recharge system. AFPRO suggested recharging of wells by using roof rainwater harvesting and ground water recharging by recharge pits along with cleaning of wells. The objectives of the intervention are to create a model of rainwater harvesting & ground water recharging and improve the ground water level.

Recharging unit of Loreto Convent School

Total five recharging units (R.U.) of size 3mx3m have been constructed in different locations to cover maximum areas to recharge groundwater. The roof top rainwater is diverted to recharging unit through 200 mm diameter pipe.

Salient features	
Location	Loreto Convent school**,** Ranchi, Jharkhand
Technology adopted	Rooftop rainwater harvesting & ground water recharging
Number of beneficiaries	1560 students & 42 Teaching staff
Average annual rainfall	1100 mm
Available roof area	1227 sqmtrs
Quantity of available rainwater	1178000 Litres
Number of recharging unit	5
Year of implementation	2007
Cost of the five recharging units	Rs.109700
Operation and maintenance	By beneficiaries

Design of the Model



Impact of artificial recharge

The short term aim of this project focused on to recharge the wells while long term aim is to enhance the water table in the project area that would facilitate promoting such recharging measures among city dwellers of Ranchi. The impact of the intervention is visible in the school as there is no flooding in the campus during rainy season. “Since last two years school faced no water scarcity even in the summer” informed one of the staffs of Loreto Convent School.

Case Study - 2

Wells as a Feasible Mode of Harvesting and Conserving Water

Introduction

Dug wells are constructed to access ground water for drinking as well as irrigation purposes. These wells are low cost solution to irrigation that supports livelihoods of many of small and marginal farmers. Water from the wells is normally pumped out to utilize during the growing season, but it also provides groundwater recharge during other seasons. Sustainability of groundwater depends on suitable measures to replenish groundwater and well is one of such measures.

Orbenga village, situated in the middle of the forest, is a small size village located in the Palkot block of Gumla district in Jharkhand. Agriculture is main occupation of 95 families residing in the village. The villagers depend on monsoon rain for agriculture, as they have limited access to irrigation facilities. However, villagers have attempted several times to harvest and conserve water through wells. The situation of drinking water in the village is also poor due to presence of excess iron in the handpump water.

Interventions

Naya Savera, a grass root NGO, requested AFPRO to provide technical support for improving water condition in the village Orbenga. In the report submitted to Naya Savera, AFPRO underlined the potential of wells as most feasible way to harvest and conserve water. To collect and store more rain water and address flesh floods problems during monsoon, AFPRO recommended constructing more wells of different sizes to deal with water scarcity prevailing in the village.

Feasibility of the wells

The wells are suitable both in terms of water availability and also in terms of its low cost. The average depth of the wells is in the range of 10-15 feet and in most of the cases water is available at 2-3 feet from the ground level. As compared with ponds, these wells occupy much less area thus preventing the farmers to part with their agricultural land to meet their irrigation requirement. Moreover boulders are available locally in plenty at cheaper rate which is used for lining of the wells. The cost of construction is also very low; in some case it is as low as Rs.10,000.00 only. This motivates the community to opt for wells as the most reliable source of irrigation.

Impact

A typical Well in the village Orbenga

In rainy season, ground water level rises up to 2-3 meters in the project area. The periodic recorded groundwater table data indicates increase in overall water level in the area. 40 wells constructed after the intervention are providing water for drinking and irrigation to the villagers. Adjacent to the wells villagers are cultivating vegetables in a properly fenced small land. These wells enabled communities to take up cultivation of Rabi crops as well as summer vegetables. In summer unlike other villages the inhabitants of Orbenga are not facing water crisis. Further, village communities need to be capacitated on managing natural resources in a sustainable manner to improve overall quality of their lives.

Case Study – 3

Water Level Indicator to Save Water and Electricity

Water supply in building through overhead tanks is normally adopted in Ranchi City of Jharkhand. In this system, an overhead tank is placed on the building for storage of water that is connected to the water source. Water is pumped through electric motor to fill the tank which requires constant supervision to save water as well as electricity. Lack of proper supervision causes overflow of water from the tank.

A water level indicator helps to remotely monitor the water-level in a tank located in the top of the building by means of a very simple control unit placed in the convenient place inside the room. Such water level indictor prevents overflowing of the water from water tank and also save electricity. The indicator has five sensors at different water levels in the water tank and specific sound signal indicates the status of water in the tank. The cost of the indicator is only Rs. 1000 per unit.

Water Level Indicator installed in the House of Mr. B.Tirkey

Mr. B. Tirkey, Ex-Director of Geological Survey of India, has installed a water level indicator in his house which he found very useful in saving lots of water as well as electricity. Besides saving water and electricity the family also saves energy which they had to spend on supervision of water filling process in the tank. Till now, the water saving device is not available in city like Ranchi due to lack of awareness among the people of this technique.

ANNEXURE -3



Case studies on water savings and water harvesting technologies adopted in villages of Jharkhand

Executive Summary

Proper water resources management in a sustainable manner is one of the most crucial issues for achieving food production demands and hence food security. This is more important now as climate change is posing to be a major threat for hydrological regimes and available freshwater resources, which will impact both rain-fed and irrigated agriculture. Thus, water use efficiency is necessary for ensuring agricultural sustainability in the future. Despite huge investments by Government in water sector, efficient water resource management at community level is still a challenge. In this situation, region specific water saving technologies need to be promoted for judicious use of water resources.

In many parts of the country, communities have developed low cost water saving technologies for irrigation and water conservation. These techniques are based on the local requirement and is replicable in similar agro-climatic regions.

Jharkhand is most vulnerable to climatic variations because of the heavy reliance on rain-fed agriculture, the poor level of water control and the poor replenishment of reservoirs. In such situation, water for irrigation as well as drinking purposes requires to be managed efficiently. AFPRO partnered with IWP made an effort to find out community practiced water saving technologies from the villages of Jharkhand State.

The project, initiated in February 2011, designed to document best practices and sensitize communities/ NGOs/ CBOs on affordable water technologies and water conservation. Till July 2011, AFPRO collected 11 cases from the field and documented on following water saving techniques, practiced by rural communities of Jharkhand. These low-cost techniques are efficient and having great potential for wider replication, where water resources are limited and agriculture is pre-dominantly rain-fed.

- Rooftop Rainwater Harvesting
- System of Rice Intensification (SRI) Cultivation
- Earthen Check dams
- Drip Irrigation system
- Wells
- Gravity Flow irrigation System
- Photovoltaic Water Pumps (PVP)
- Water Level Indicator

In the month of August 2011 a dissemination workshop to sensitize Communities, NGOs, CBOs and Government is planned in Godda district of Jharkhand followed by Hazaribag district in September 2011.

The present report contains 3 case studies of different water savings and water harvesting technologies adopted by people of Jharkhand. It cover different district of Jharkhand like Ranchi, Giridih and Godda. These case studies provide experience and lesson learned on choosing the proper technology and its implementation to ensure success and sustainability. These technologies have immense potential under the present context of impending threat of climate change.

Case 1: Adaptation at Community Level

Adaptation is ultimately about maximizing welfare over time. In the context of agriculture and climate change, taking advantage of any potential benefits can be handled largely by application of available technologies from existing agro-climatic systems. Adaptation takes place on farm (individual) level, at system/catchment/micro catchment (community – village or cluster) level and at basin (macro) levels. Trade-offs and constraints at basin scale determine what farmers on the land can and will do in response. Adaptations can be private or public, planned or autonomous. There is a great deal of room for all, but both private and autonomous adaptation will occur largely in terms of what can be achieved in practice at the farm-gate. In the absence of planned and public strategies, farmers may find themselves in an age-old situation of some familiarity – fending for them. In situations where climate change will have adverse impacts – principally in terms of reduced productive capacity owing to declining water resources availability and poorer agro-climatic conditions for crop growth, the broad adaptive capacities and options **recommended by FAO (Climate change, water and Food Security, FAO Water Report 36, 2011) are**:

- **Modify the threat** – at an individual level, expand farm size and benefit from economies of scale; improve water use efficiency through better technology and management, where real water savings can be made.
- **Change use** – crop change, land-use change, mix of rainfed and irrigated production change on farm.
- Research to find adaptations – improve crop productivity in higher temperatures and with greater moisture stress, by linking with research institutes on agriculture and Krishi Vigyan Kendras for moisture and temperature tolerant crop varieties.

- Bear the loss – Accept reductions in area or productivity. This is what perhaps the people were doing until now, however, bearing the loss may not be acceptable to them anymore as they have reached the bottom of their poverty and for survival they need to do something different or differently.
- Share the loss – distribute the impacts of reduced water resources to share reductions in area and productivity – a more managed approach involving a re-allocation of water use rights, for instance – Possible but challenging due to the socio-political dynamics at community levels
- Change location – farming regions—May not be possible at all.
- **Educate for behavioural change** – Need of the hour and absolutely possible.

In this project, AFPRO has documented the efforts of the locals in Jharkhand, which falls under the spectrum of **Modify the Threat** and **Change Use**.
The following case study shows precisely how the locals with the technical assistance from AFPRO have modified their threat through a mix of rainfed and irrigated agricultural systems creating more livelihood options through agriculture and fisheries.

Introduction to the case study:

Dalgando is a small village located in the district of Giridih in the state of Jharkhand in India. It has a population of about 248 persons living in around 41 households. Agriculture is the main economic activity in the area. Paddy and maize are the main crops grown by villagers. Agro climatic conditions of the area are suitable for cultivation of vegetables. This village comes under rainfed agriculture. Farmers were growing only one crop in year due to lack of irrigation facilities. Villagers were facing problems not only in irrigation; there was lack of drinking water for animals.

Bandh - Dalgando

A local NGO Pragatisheel Yuva Kendra came forward to resolve the water crisis for irrigation and suggested construction of earthen Dam. The construction of earthen dam was implemented with the support of FORRAD. The main objective of this project is to solve the problem of irrigation water in the area.

Salient features	
Location	Village Dalgando **,** District Giridih, Jharkhand
Technology adopted	Earthen dam construction.
Year of implementation	2006
Area covered	15 Acres
Beneficiaries	ST
Number of beneficiaries	35 Families
Purpose	Providing irrigation water round the year.
Implementing agency	Pragatisheel Yuva Kendra, Giridih
Repair and maintenance	By beneficiaries through mechanism of charging.

Economic benefits –

- After the construction of earthen dam farmers are growing two or more crops in one year. They are growing paddy in kharif and wheat, pulses and vegetable in Rabi season. Due to earthen dam irrigation of 15 Acres of land in kharif and 5 acres of land in rabi is possible. Farmers are getting total annual income of Rs 1, 00,000 which has helped to improve the economic condition.
- The community also practices fishery in this dam. This change in use has provided them with extra income and livelihood options, which have increased their adaptive capacity.

Environmental benefits - It has been observed that the site has good catchment. In this dam, natural inlet / outlet have been provided. The embankment is found strong and grass has grown all over the embankment. Water remains in the dam even in the summer season.

Social benefits - Apart from providing irrigation to about 15 acres of paddy fields, it also caters to the requirement of the community in terms of bathing, washing and drinking water requirements of cattle, being the only water body in the village.

Addressing Sustainability

Villagers were provided mobile diesel pump set and pipes. This is used by the community as per their convenience. Users group has been constituted for the proper management of the pump and pipes. They charge Rs.30 per hour for using the pump and this money is used for repair and maintenance of the asset.

Case 2: Adaptation with Co-benefit of Mitigation:

In forest fringe, hilly terrains of India, the availability of water is restricted not necessarily due to insufficient rainfall, but due to unavailability of water in farmers' plots, primarily due to the terrain of the area. In hilly forest fringe areas Jharkhand, AFPRO had been working on a low cost irrigation system, in which water from streams is diverted to nearby agricultural fields by constructing diversion weir and contour canals. The hilly terrain allows the water to flow under gravitational force to the nearby villages. The water in the agricultural fields has brought around wide smiles. The villagers are able to produce both kharif and Rabi crops. It has brought back the people to their villages (stopped migration). Both boys and girls are being sent to schools, instead of being forced to earn for the family. The assured irrigation is a big step in combating the uncertainty of rainfall and impending threat of climate change. Moreover, the flow of water is governed by gravitational force and not powered by pumps. This reduces the carbon emissions (due to non-use of energy/electricity for pumps) and contributes to mitigating climate change. Thus addressing the twin aspects of Adaptation and Mitigation of climate change, which is unique in India, if not the world and along the lines of recommendations from World bank, FAO and other multilateral agencies of adaptation and mitigation to be considered together and should not be considered as stand - alone projects in themselves. The villages have achieved substantial economic self sufficiency without endangering the environment. This system is also easily adaptable by small and marginal farmers and has a huge potential of replication in other parts of India and world.

This is a system where water flows by the force of gravity from a higher to lower elevation. It is a system in which water flows to the field not by any lifting device like pumps but by the force of gravity which helps the water to reach the fields, naturally. The biggest advantage of gravity irrigation system is that it does not involve any recurring expenditure such as cost of fuel or electricity which is used for running the pump sets in the lift irrigation mechanisms. It is easy to maintain and manage by the community at their level.

Introduction to the case study:

The village Baghakol is situated in Godda district of Jharkhand, India. The main occupation of villagers is agriculture. Rain fed agriculture is the backbone of the economy. Almost more than 98% of agriculture lands depend on rainwater. Productive agriculture land of farmers is situated in low land. Farmers work in their field during kharif season (June-Sept). Rest of the months they work as casual labors in different Government schemes or private work.

In village Baghakol, the farmers take irrigation from a Lift irrigation system (LIS) installed by the World Vision's Godda ADP (Area Development Programme). There is an intake well to draw the water from the stream which gets dried up by the month of March. The villagers

expressed that the intake well was not sufficient to provide irrigation to the entire area. It was proposed to construct one check dam to improve the recharging of the intake well.

To improve the crop production in 100 acres of land for 48 farmers belonging to ST category in the village Baghakol, Block Poriyahat, District Godda, a technical feasibility study was conducted by AFPRO. An alternative site was selected that could provide flow irrigation to the area. The proposed site has catchment area of 24 Km^2 (as per information provided by the village people). By conducting systematic site selection, river water is utilized to provide gravity flow irrigation to a large area of agricultural land. A check dam was construction to enable gravity flow system, so that water could reach the field. Approximately 100 acres of agricultural land is receiving irrigation facility from this structure. People are also saving from non-use of diesel operated pump sets, which they were using earlier. The available water is sufficient for taking to take two crops in a year.

Check dam under construction

Reservoir of check dam

Case 3: Change in crops – increases adaptive capacity at Individual level

Adaptation does not necessarily mean we need to do something different. Adaptation provides immense scope to build upon local traditional knowledge and practices, because, adaptation is nothing new to the community, they have been adapting to different situations all through their life and history. Revival of traditional coping mechanisms is beneficial in the following aspects:

- It is less cost intensive
- It is easily accepted by the society
- Least capacity building is required as people are usually acquainted with the technology.
- It has potential for wider replicability.

Introduction to the case study:

In three villages of Dahu Tola, Sanga and Choube Khatanga of Ranchi, construction of seven irrigation wells have provided irrigation facilities to 50 acres of land, during Rabi. For rainfed areas, well, is the sustainable mode of water saving and water harvesting. This is preferred by individual small and marginal farmers with very small land holdings, over other large water harvesting structures like check dams, ponds etc. This also addresses the needs of the socially excluded households in rural India.

Well of Phagu Oraon, Village-Choube Khatanga
No. of beneficiaries = 5
Area benefitted = 3 acres

Well of Charan Sahu, Village-Dahu Tola
No. of beneficiaries = 6
Area benefitted = 3 acres

The importance of this case study does not lie in mentioning about the construction of irrigation wells, but on the **impact that these wells have on increasing the adaptive capacity of the farmers**. Earlier farmers were not able to take more than one crop in a year. But now farmers are growing **vegetables throughout the year**, **shifting from the usual kharif crop cultivation**. This is possible only due to availability of water in these wells. The production of vegetables is limited, as these farmers have very less land holdings. The surplus produce (of vegetables), which is very little, is being sold by the farmers in the market, directly to consumers. This direct sell fetches a good price, which has improved their economic to a great extent. The average income from each well is approximately Rs. 30, 000 to Rs. 50, 000, per year, depending upon market conditions. It has also reduced the migration of people. Moreover, vegetables in their regular diet have enhanced their nutritional status, especially for women and children. Thus, introduction of just a well, traditional water harvesting system which is very common to all Indian families can lift the economic situation and ensure nutritional security to millions of poor and marginalized farmers and their families. Another **important aspect** worth mentioning is, water is lifted from the wells by using a bucket and bamboo and rope and **no pumps are used**. Hence the intervention also addresses **the mitigation benefits**.

ANNEXURE – 4



SENSITIZATION WORKSHOP

ON

BEST PRACTICES ON WATER CONSERVATION AND AFFORDABLE WATER SAVING TECHNOLOGIES

Date : 24th August, 2011

Venue : Krishi Vigyan Kendra, Godda, Jharkhand

Supported by : India Water Partnership (IWP)

Organized by : AFPRO Field Unit IV, Ashok Nagar, Ranchi, Jharkhand

Agenda of the Workshop

Inaugural Session

- Registration of participants
- Introduction of participants
- Objectives of the workshop
- Welcome address

Technical Session

- Importance of Water Conservation to cope with problems arising from erratic rainfall
- Water management and Crop Planning
- Need for adopting Water Harvesting Practices and Water Saving Technologies
- Dissemination of information collected by AFPRO regarding Low Cost Water Saving and Water Harvesting Technologies

Introduction

Action for Food Production (AFPRO) partnered with India Water Partnership (IWP) made an effort to find out community practiced water saving technologies from the villages of Jharkhand State. The project, initiated in February 2011, designed to document best practices and sensitize communities/ NGOs/ CBOs on affordable water technologies and water conservation.

Till July 2011, AFPRO collected 11 cases from the field, practiced by rural communities of Jharkhand, and documented these cases for wider dissemination. These low-cost techniques are efficient and having great potential for wider replication in the semi-arid areas where farming communities mainly depends on monsoon for agriculture operations.

In the month of August 2011 a dissemination workshop was organized to sensitize Communities, NGOs, CBOs and Government in Godda District of Jharkhand. A brief note on the workshop is described below by highlighting the feedback of the participants.

Workshop Report

On August 24, AFPRO organized a workshop on “Best Practices on Water Conservation and Affordable Water Saving Technologies”. The workshop was supported by IWP and held at Krishi Vigyan Kendra (KVK) of Godda District in Jharkhand. The objective of the workshop was to inform, make aware and sensitize the Panchayati Raj Institution (PRI) Members, Government and NGO Officials, and community members on low cost water harvesting and water saving technologies for sustainable water resource management.

35 participants, including User Group and PRI members from different villages of Godda District participated in workshop and actively engaged in the discussion. (List of Participants attached in Annexure-1). Scientists from Krishi Vigyan Kendra were also present.

The workshop was inaugurated with Dr. Ravi Shankar, Programme Coordinator, KVK Godda, lighting the lamp. After which David Philip, Manager of World Vision India, moderated the event. Mr. A.P. Thakur, Programme Assistant, KVK Godda, in his welcome speech emphasized the need for effective water resource management to address the prevailing water crisis in the State.

In the first session, Ms. Neelam Kumari, Junior Agriculture Specialist of AFPRO welcomed the guests with a brief introduction to the idea behind organizing the workshop. She went on to share case studies of AFPRO’s field experience in water saving and water harvesting technologies, with special emphasis on low cost technologies. Following are the technologies that were shared and discussed at the workshop:

- Rooftop Rainwater Harvesting
- System of Rice Intensification (SRI) Cultivation

- Earthen Check Dams
- Drip Irrigation System
- Gravity Flow Irrigation System
- Well Irrigation
- Photovoltaic Water Pumps (PVP)

Mr. Rajpal Singh and Dr. H.K.Chaurasia, Scientist and Resource Person of KVK, facilitated the next technical sessions on 'Water Management and Crop Planning'. The main focus of this session was on selecting crops according to the availability of water. The topics discussed by them in an interactive manner were:

- Watershed development
- Different water saving varieties of wheat and rice
- Drought tolerant crops which can be grown in Godda
- Water requirements of different crop
- Rainwater harvesting systems which can be followed in Jharkhand

Followed by this, Dr. Chaurasia discussed the follwoing water harvesting practices and water saving technologies with the support of a photo presentation:

- Drip Irrigation
- Sprinkler Irrigation
- Watershed Management
- Selection of crop according to soil type
- Mulching

Both these sessions were followed up with Mr. Philip screening a movie on 'Costless Costfree Irrigation'.

In the post lunch session, the participants were exposed to fields where SRI and different water saving varieties of rice were being cultivated within the KVK campus.

As a part of the feedbacks session (on the relevance and success of the workshop) participants expressed their hesitation to implement water harvesting techniques like drip and sprinkler irrigation as they felt these technologies are too difficult to practice at the local conditions. However, they felt that rainwater harvesting is an important and easier technology to implement. Thus, more efforts are required to convince people regarding alternate water harvesting and water saving technologies.

The workshop concluded with Ms. Kumari giving the Vote of Thanks in which she expressed AFPROs gratitude to KVK and World Vision India for the support they extended as well as all those who were directly and indirectly involved in the workshop.

Inaugural Speech by Dr. Ravi Shankar, of KVK Godda

Resource Persons

(From Left to Right) Ms. Neelam Kumari (Jr. Agriculture Specialist, AFPRO), Dr. H.K.Chaurasia (SMS (Hort.), GVT, KVK Godda), Mr. David Philip (Manager, WVI Godda), Mr. Rajpal Singh (SMS (Agronomy) GVT, KVK Godda), Dr. Ravi Shankar (Programme Coordinator, KVK Godda), and Mr. A.P.Thakur (Programme Assistant, KVK Godda).

Participants of the Workshop

Ms. Neelam Kumari sharing case studies of AFPRO's field experience in water saving technologies

Annexure-1

List of Participants

SN	Name of Participants
1.	Sonot Tudu
2.	Francis Hansda
3.	Joseph Soren
4.	Anil Singh
5,	Manoj Singh
6.	Thomas Hansda
7.	Bhagwan Murmu
8.	Mariwas Hansda
9.	Augustine Soren
10.	Dihari Hansda
11.	Sivcharan Hembram
12.	Bablu Soren
13.	Uday Baski
14.	Manwel Hembram
15.	Janardan Singh
16.	Sitaram Baski
17.	Mahendra Rana
18.	Alfa Kachhap
19.	Nandkishore
20.	Marwari Baski
21.	Jairam Soren
22.	Hridaynarayan Marandi
23.	Bhagwan Hansda
24.	Kameshwar Hembram
25.	Ramu Soren
26.	Dr.H K Chaurasia
27.	Rajpal Singh
28.	Dr.Ravi Soren
29.	A P Thakur
30.	Gopal Murmu
31.	Gita Devi
32.	Santaram Soren
33.	Mahavir Singh
34.	Bikram Hansda
35.	Hari Baski

ANNEXURE – 5

SENSITIZATION WORKSHOP

ON

BEST PRACTICES ON WATER CONSERVATION AND AFFORDABLE WATER SAVING TECHNOLOGIES

Date : 28th September, 2011

Venue : Manav Vikas, Ichak, Hazaribag (Jharkhand)

Supported by : India Water Partnership (IWP)

Organized by : AFPRO Field Unit IV, Ashok Nagar, Ranchi, Jharkhand

Agenda of the Workshop

Inaugural Session

- Registration of participants
- Introduction of participants
- Objectives of the workshop
- Welcome address

Technical Session

- Importance of Water Conservation to cope with problems arising from erratic rainfall
- Water management and Crop Planning
- Need for adopting Water Harvesting Practices and Water Saving Technologies
- Dissemination of information collected by AFPRO regarding Low Cost Water Saving and Water Harvesting Technologies

Introduction

Action for Food Production (AFPRO) partnered with India Water Partnership (IWP) made an effort to find out community practiced water saving technologies from the villages of Jharkhand State. The project, initiated in February 2011, designed to document best practices and sensitize communities/ NGOs/ CBOs on affordable water technologies and water conservation.

Till July 2011, AFPRO collected 11 cases from the field, practiced by rural communities of Jharkhand, and documented these cases for wider dissemination. These low-cost techniques are efficient and having great potential for wider replication in the semi-arid areas where farming communities mainly depends on monsoon for agriculture operations.

In the month of August 2011 a dissemination workshop was organized to sensitize Communities, NGOs, CBOs and Government in Godda District of Jharkhand. A similar workshop was organized in the month of September 2011 in Hazaribag District. A brief note on the workshop is described below by highlighting the feedback of the participants.

Workshop Report

Welcome address by Mr. Birbal Prasad, Secretary, Manav Vikas

On September 28, AFPRO organized a workshop on “Best Practices on Water Conservation and Affordable Water Saving Technologies”. The workshop was supported by IWP and held at Training Centre of Manav Vikas, Hazaribag in Jharkhand. The objective of the workshop was to inform, make aware and sensitize the Panchayati Raj Institution (PRI) Members, Government and NGO Officials, and community members on low cost water harvesting and water saving technologies for sustainable water resource management.

Around 30 participants, including user group members and PRIs from different villages (Simradhab, Nagri, Nano, Urukka, Darha, Dighi, Phuphandi, Simra, Barwan, Kaladuar, Jamdiha of Ichak and Churchu blocks) of Hazaribag district participated in the workshop and actively engaged in the discussion. (List of Participants is attached in Annexure-1). Mr. Birbal Prasad, Secretary, Manav Vikas, Ichak, Hazaribag facilitated the workshop.

Mr. Ajit Kumar sharing the case studies on Low Cost Water Saving Technology

The work shop was inaugurated by Dr. D.K.Raghav, KVK, Hazaribag by lighting the lamp. After which, Mr. Birbal Prasad delivered the welcome address and stressed the need to adopt low cost water saving technologies at the prevailing water crisis of the State.

In the first session, Mr. Ajit Kumar, Unit Manager of AFPRO welcomed the guests with a brief introduction to the purpose behind organizing the workshop. In his deliberation, Mr. Kumar explained the importance of water management and crop planning for any scheme to be successful and sustainable. Further, equitable water sharing was also discussed with the participants. He went on to share case studies of AFPRO's field experience in water saving and water harvesting technologies, with special emphasis on low cost technologies. Following are the technologies that were shared and discussed at the workshop:

- Rooftop Rainwater Harvesting
- System of Rice Intensification (SRI) Cultivation
- Earthen Check Dams
- Drip Irrigation System
- Gravity Flow Irrigation System
- Well Irrigation
- Photovoltaic Water Pumps (PVP)

Apart from these case studies, the different successful low cost water harvesting and irrigation systems, implemented by AFPRO, in different locations across the State were also discussed.

The next technical session on Water Management and Crop Planning was facilitated by Dr.D.K.Raghav, Scientist and Resource Person of Krishi Vigyan Kendra (KVK). The main focus of this session was on selecting crops according to the availability of water. The topics discussed by them in an interactive manner were:

- Importance of water conservation
- Watershed development
- Different water saving variety of wheat and rice
- Drought tolerant crop which can be grown in Hazaribag
- Water requirement of different crop
- Rainwater harvesting system which can be followed in Jharkhand
- Drip irrigation
- Sprinkler irrigation
- Selection of crop according to water availability
- Mulching

Dr.D.K.Raghav,KVK, Hazaribag taking the technical session

In the post lunch session, a brief interactive session was held in which the Resource person responded to the queries of the farmers. The farmers generally asked questions related to crop water and disease management. This was a very useful session in which the farmers learnt the proper water management, pest management and biological method of pest control for crops, as revealed by one of the participants.

As a part of the feedbacks session (on the relevance and success of the workshop) participants expressed their hesitation to implement water harvesting techniques like drip and sprinkler irrigation as they felt these technologies are too difficult to practice at the local conditions. However, they felt that rainwater harvesting is an important and easier technology to implement. Thus, more efforts are required to convince people regarding alternate water harvesting and water saving technologies.

The workshop concluded with Mr Ajit Kumar giving the Vote of Thanks in which he expressed AFPROs gratitude to Manav Vikas and KVK for the support they extended as well as all those who were directly and indirectly involved in the workshop.

Annexure-1

List of Participants

SN	Name of Participants
1.	Aroju Devi
2.	Anjali Devi
3.	Baby Devi
4.	Samari Devi
5,	Khagia Devi
6.	Md.Reshmi
7.	Md.Sudama
8.	Md.Jaswa
9.	Kakani Devi
10.	Anju Devi
11.	Kanhan Devi
12.	Biru Mahto
13.	Sone Mahto
14.	Lalo Mahto
15.	Ramji
16.	Srilata Tirkey
17.	Mintu Kujur
18.	Prabhu Singh
19.	Shanakar Mahto
20.	Jageshwar
21.	Khushmendar Mehta
22.	Nikki Hembram
23.	Tako Manjhi
24.	Chhotelal Murmu
25.	Shatrughan Mahto
26.	Kuhu Rani Devi
27.	Shamshad Alam
28.	Lakhan Tirkey
29.	Shayamal Mahto
30.	Ritu Devi

ANNEXURE – 6

SENSITIZATION WORKSHOP REPORT ON

WATER CONSERVATION AND AFFORDABLE WATER TECHNOLOGIES AND BEST PRACTICES

Venue	: Social Development Center, Purulia Road, Ranchi, Jharkhand
Date	: 16th December, 2011
Organised by	: Action for Food Production (AFPRO)
Supported by	: India Water Partnership (IWP)

Introduction:

A one-day State Level Workshop was organized on 'Water Harvesting and Conservation – An Affordable Water Technologies and Best Practices' organised by Action for Food Production (AFPRO) with the support of India Water Partnership (IWP). The workshop was held at Social Development Center, Purulia Road, Ranchi, Jharkhand by Action for Food Production (AFPRO) on December 16, 2011. The detailed agenda of the workshop is attached in Annexure-1.

40 participants from different districts of the State of Jharkhand attended the workshop. The details attached in Annexure-2. The participants were mainly from Birsa Agriculture University (BAU), Water Resource Department, NABARD, Agriculture department, World Vision India, Government representatives, reprentratives from local NGOs and media persons. The workshop was based on the principle of participation, where each participant got an opportunity to share their views regarding the concern issues.

Inaugural Session:

The workshop started with a welcome speech of Ms. Neelam Kumari, Junior Agriculture Specialist, AFPRO. Swami Shashankanand Jee Maharaj, Secretary, Ram Krishna Mission was the Chief Guest on the occasion. He inaugurated the workshop by lightening the lamp followed by speech.

After the introduction seesion, the Honorable guests Ms. Hemangini C. Kumar, District Agriculture Officer, Mr. Jyoti Kumar Mukhiya, Associate Director, World Vision India and Yoganand Mishra, Water Resource Department shared their views on the need of water conservation in the present context of water crisis prevailing in the region. The degnitries also made cognizant about the Government's ongoing programme on water conservation in the State. They also higlighted and appricpated the efforts of Non Government Organisation (NGO) and Corporates in promoting low cost water conservation and hervesting technologies in different parts of the State.

Picture-1: Speech by Chief Guest

Technical Session:

Dissemination of information collected by AFPRO regarding low cost water saving and water harvesting technology

Dr. Pradeep Kumar Oroan, Hydrogeologist, AFPRO

The technical session of the workshop commence with the brief introduction about the workshop proceedings along with objective, shared by Dr. Oroan. Further, he shared the current status of water table in the State of Jharkhand. "Present water crisis widespread in the State is a major area of concern for Government as well as development organizations" Dr. Oroan said and believed that adopting suitable water conservation and water harvesting measures could prove supportive in overcoming from such crisis.

Picture-2: Presentations by Dr. Pradeep Kr. Oraon

Sharing of field experience on Low Cost Water Saving Technologies

Mr. Ajit Kumar, Unit Manager, AFPRO, Ranchi

Mr. Kumar shared the different case studies collected and documented by AFPRO under the India Water partnership Project. He elaborately discussed different low cost water harvesting structures and water conservation techniques promoted by AFPRO in different part of Jharkhand. "Community acceptance is the key to success for any of the intervention" he said and highlighted the region specific low cost water conservation and harvesting measures developed and promoted by AFPRO across the country, including Jharkhand. After Mr. Kumar deliberation, Users Group members from different project areas were invited to share their views and experience on the practices adopted by them on water saving.

Picture-2: Presentation by Mr. Ajit Kumar

Importance of forest in water conservation and water harvesting

Dr. S.M. Sulaiman Quli, Head of Department, Forestry Department, Birsa Agriculture University

Dr. Quli talked about the importance of forest in water conservation and water harvesting. "Forests help to maintain constant supplies of good quality water, loss of forests can cause everything from flooding to aridity and for catastrophic losses to water quality" he said and expressed the need to conserve forest to reduce run-off, increase precipitation and overall improvement in water table of the area.

Water management and crop planning

Mr. Pran Ranjan, representative of SPWD

Mr. Ranjan discussed on Water management and crop planning with the participants. He briefly explained the land use pattern and water situation of Jharkhand. He shared the practical experience of different soil and moisture conservation activities carried in SPWD supported projects at various locations with the impact on checking the soil erosion, increased water availability and improved food security.

Picture:3-Presentation by Pran Ranjan

Experience sharing on watershed management

Fr. Halan Bodra, Director, SJVK, Jamshedpur

Fr. Halan Bodra, Director, SJVK explained regarding different water conservation structure for improving the living standard of villagers in SJVK project area. While explaining the activities carried out in the project area at Tonto Block of West Singhbhum district, he said "participatory activity at local level provides great opportunity in accepting water harvesting structures by larger community". Later, he explained how the construction of field bunds, staggered trenches, and gully plugs etc helped in increasing water level in the project areas of SJVK.

Picture-5: Experience sharing by Fr. Halan Bodra

In-Situ Moisture Conservation

Mr. R. K. Singh, Scientist, Lac Production, IINRG, Ranchi

Mr. Singh talked about the role of in-situ moisture conservation in the cultivation of Lac. He described an experiment where different soil moisture conservation methods were studied on the impact of the growth of the Ber plant. The study found that the highest soil moisture content was observed in mulching in almost every month. Further he discussed the various in-situ soil moisture conversations for improving cultivation.

Picture-6: Experience sharing by Mr.R.K.Singh

Video film show on vulnerability assessment and enhancing the adaptive capacity to climate change

This was followed by a video film developed by AFPRO on "Vulnerability and Adaptation to climate change". The film depicted a wide range of approaches aimed at reducing the vulnerability of agricultural systems to water related climate change impact in Mahbubnagar (Andhra Pradesh) and Udaipur (Rajasthan) districts of the country.

Rainwater Management

Mr. D. K. Rusia, H.O.D. of Agriculture Engineering department, BAU

Mr. Rusia presented different means of water harvesting practices suitable for different regions and said "soil and water are the most important natural resources in rainfed agriculture". Further he emphasized "successful cultivation of rainfed crops depends on the skillful management of rain water through proper in situ moisture conservation techniques and soil health". At the end of his presentation he also explained the management of rain water for the use of various purposes presentation in details with simple techniques to manage rainwater for agricultural use.

Picture-7: Presentation by D. K. Rusia

Concluding Session
Mr. Ramlal Prasad of JSP

"Groundwater is depleted day by day and current scenario indicates the level of ground water is below the 17 m b. g. l. in Jharkhand" Mr. Prasad said in the concluding session. Sharing his experiences and the statistics relating to benefits of efficient management of water resources he said "the success ratio of groundwater exploration through hand pump only for drinking purpose is nearly about 53%. In those areas where the water conservation and harvesting techniques has been applied, the water level goes up and is maintained".

Further, he discussed the need of community participation in promoting water conservation measures at local level and suggested "water harvesting and conservation practices can be done at lower cost by careful planning and community participation". Afterwards in the concluding remark he said "Plantation is very important activity for conservation of soil and water. Water Level Indicator is found an effective tool to Save Water and Electricity in domestic consumption". Considering the alarming water crisis, he felt a need for all sectors to join hand together towards sustainable and effective water resource management at local level.

Vote of Thanks:

On behalf of AFPRO, Mr. Ajit Kumar expressed thanks to Honorable Chief Guest Swami Shashankanand Jee Maharaj for giving his valuable time for the workshop. He also thanked Swami Jee for his cherished speech and blessings for inspiration towards concentrated efforts for the noble cause of water harvesting and conservation in the region.

Mr. Kumar also expressed gratitude to the representatives of Water Resource Department, Agriculture Department and World Vision India for their whole-hearted participation. He sincerely thanked JSP, MV and SUPPORT for their participation with User Groups and sharing the field experiences. Mr. Kumar also thanked to SJVK, Jamshedpur, SPWD, IINRG, BAU for their sharing of experiences on water harvesting and conservation in the Workshop. He also expressed thanks to all the participants, NGOs, Government officials for being wonderful audience throughout the event. The support of SDC staff for organizing the workshop successfully was also appreciated by Mr. Kumar.

Lastly, he specially mentioned the direct and indirect support and guidance of each and every individual that helped to organize the workshop successfully. At the end, Mr. Kumar extended his thanks to IWP for providing a grateful opportunity to organize the workshop.

Annexure-1

SENSITIZATION WORKSHOP REPORT ON
WATER CONSERVATION AND AFFORDABLE WATER TECHNOLOGIES AND BEST PRACTICES

Venue : Social Development Center, Purulia Road, Ranchi, Jharkhand
Date : 16th December, 2011
Organised by : Action for Food Production (AFPRO)
Supported by : India Water Partnership (IWP)

Agenda of workshop

Inagaural Session:

- Welcome address by Ms. Neelam Kumari, Junior Agriculture Specialist, AFPRO
- Inauguration wami Shashankanand Jee Maharaj, Secretary, Ram Krishna Mission, Jharkhand
- Introduction of participants

Technical Session:

- Dissemination of information collected by AFPRO regarding low cost water saving and water harvesting technology - AFPRO
- Field experience sharing - AFPRO
- Importance of forest in water conservation and water harvesting - Dr.S.M.S Quli, H.O.D. of forestry department, Birsa Agriculture University, Ranchi.
- Water management and crop planning - SPWD
- Experience sharing on watershed management - SJVK, Jamshedpur
- In Situ Moisture Conservation - Scientist of IINRG, Namkum, Ranchi
- Video Film on vulnerability assessment and enhancing the adaptive capacity to climate change
- Rain Water Management - Mr. D. K. Rusia, H.O.D. of Agriculture Engineering department, BAU
- Concluding Session - Mr. Ramlal Prasad of JSP

Vote of Thanks - AFPRO

Annexure-2

List of Participants

SN	Name of participants	Organization/ Department
1.	Swami Shashanka Jee Maharaj	R.K. Mission
2.	Swami Diwakar Jee Maharaj	do
3.	Mr.Y.N.Mishra	Water Resource Department
4.	Mrs.Himangani C.Kumar	District Agriculture Officer
5.	Mr.J. Mukhia	WVI
6.	Arpan Bose	FXB India
7.	Hari Narayan	FXB India
8.	Birbal Prasad	Manav Vikas
9.	Bishnu Kumar	User group member
10.	Ishwari Mahto	User group member
11.	Sarju Mahto`	PRI member
12.	Shibu Ram	User group memer
13.	Chunu lal Hemrom	PRI member
14.	Edward Lakra	Catholic Charities
15.	Sachchidanand	MMKK
16.	RamKrishna Maharaj	R K Mission
17.	Jyoti Mukhia	World Vision India
18.	Meeta Jauhar	Plan India
19.	R K Singh	SUPPORT
20.	Manoj Mahto	-Do-
21.	Ramlal Prasad	Jan Sewa Parishad
22.	Pawan Kr.Singh	SUPPORT
23.	Rahul V Patil	NABARD, Ranchi
24.	Swami Tanmay Maharaj	R K Mission
25.	Manoj Kuzur	SUPPORT
26.	Jai Nath Mahto	User Group member
27.	Naresh Kumar	PRI representative
28.	Sharad Singh	SPWD
29.	Praveen	Prabhat Khabar, Ranchi
30.	Yognand Mishra	WRD, Govt.official Jharkhand
31.	Chandradhar	GSF
32.	R K Singh	IINRG, Namkum
33.	Jag Narayan	Samekit Jan Vikas Kendra
34.	Fr.Halen Bodra	Samekit Jan Vikas Kendra
35.	Ashsih Kr.Das	Samekit Jan Vikas Kendra
36.	Dr.SMS Quli, Deptt.of Forest	HOD, Forestry, Birsa Agri.University
37.	Ashsih Tigga	Dainik Jagaran, Ranchi
38.	D K Rusia,Head Agril.Engg.	Head Ag.Engg.BAU Ranchi
39.	Pran Ranjan	SPWD
40.	Chunnulal Hembram	Manav Vikas
41.	Ajit Kumar	AFPRO
42.	Dr. Pradeep Kr.Oraon	AFPRO
43.	B N Prasad	AFPRO
44.	Neelam Kumari	AFPRO
45.	AKD Mazumdar	AFPRO

प्रभात खबर
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रांची. शनिवार, 17 दिसंबर, 2011 12

जल संरक्षण व मिट्टी कटाव पर चर्चा

संवाददाता ■ रांची

एसडीसी सभागार में शुक्रवार को जल संरक्षण विषय पर कार्यशाला का आयोजन हुआ. आयोजन एक्शन फॉर फूड प्रोडक्शन (एफ्रो) के तत्वावधान में किया गया था. इसमें मुख्य अतिथि के रूप में रामकृष्ण मिशन आश्रम के स्वामी शशांकानंद उपस्थित थे. कार्यशाला में जल संरक्षण एवं मिट्टी के कटाव से बचने के संबंध में चर्चा हुई. इस क्षेत्र में एफ्रो व विभिन्न सहयोगी संस्थाओं के माध्यम से चलनेवाले कार्यक्रमों की जानकारी दी. संस्था ने हजारीबाग, गुमला व अन्य क्षेत्रों में तालाब, कुआं व नहरों के जरिये जल प्रबंधन के तरीकों की जानकारी दी. पहाड़ी इलाकों में मिट्टी को काट कर किस तरह जल प्रवाह को नियंत्रित किया जा सकता है, यह भी बताया गया. कार्यक्रम में स्वामी शशांकानंद ने कहा कि कम खर्च में भी विभिन्न तकनीकों के जरिये जल का बेहतर प्रबंधन हो सकता है. उन्होंने तकनीक को सरल, व्यावहारिक व कम खर्चीला होने की बात बतायी. कार्यशाला में जल संसाधन विभाग के योगानंद मिश्रा, जिला कृषि पदाधिकारी हिमांगिनी सी कुमार, ज्योति कुमार सहित अन्य उपस्थित थे.

एसडीसी में जल संरक्षण पर कार्यशाला