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# ACTION

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## ED's Note

Water scarcity, drought and salinity are among the most important environmental constraints impending food security in rainfed agriculture systems. Agricultural activities consume about 80% of water, while in areas with extensive agricultural activities; this percentage is even more of total water use. The increasing need of water in agriculture should be focused on efficient management of existing water resources by adopting improved as well as appropriate technologies related to soil moisture retention, irrigation, water storage, replenishment of reservoirs and agriculture practices. Absence of such practices would adversely affect crop production that is directly responsible for food security and livelihoods of poor and marginal farmers.

Small and marginal farmers are most affected from water stress situations, and need simple, sustainable and effective measures for water conservation and management. AFPRO has a long and illustrious experience of working on water resource management. The leanings from community centric interventions assist the community in identifying and accepting region specific low cost models on efficient water use in agriculture and allied activities. Such models include drip irrigation, gravity flow systems, in-situ soil and moisture conservation, water harvesting measures, System of Rice Intensification (SRI) and Integrated Farming Systems. Further, AFPRO takes immense interest in capacitating the farming communities for adapting to different water stress conditions under current climate change regimes.

The Government of India has initiated several programmes to improve investment and administration in the water sector. The desired success would however depend on adoption of suitable and diverse options related to water management and farming practices, at the local level. Institutionalizing policies and programmes that create incentives for conserving water and eliminating subsidies that encourage unsustainable water-use patterns would promote sustainable management of water resources, which is likely to be scarcer, under the challenging threat of global climate change.

**DK Manavalan**

Executive Director, AFPRO

## Water Conservation and Management for Sustainable Rural Livelihoods

- Pradip Kumar, Principal Specialist cum Coordinator, NRM, AFPRO, New Delhi

At the foothills of the Aravalis, the **Mission Sunehara Kal** project area, situated in the district of Mewat of the north-western state of Haryana, is part of degraded common land and private agricultural lands of two Gram Panchayats – Sarai and Kota. The project area has distinct topographic features with flat alluvial plains over most of the region, long and narrow pediments, and local undulations. It is occupied by scattered isolated strike ridges of old rocks, relicts of the former Aravali mountain chain of the Pre-Cambrian era, in the upper reaches of the catchment. Practically, inexhaustible deposits of quartzite are found in the Aravali ranges of the district. Huge deposits of good quality slate occurring in shades of green, black, and brown exists in the district. However, illegal and uncontrolled mining have caused severe degradation in the region. The soils are not so fertile. The natural erosive processes have been accelerated by human use. Factors such as increased human population, deforestation with expansion of real estate and resorts, and improper land management have caused steady but obvious resource degradation, particularly of land and water resources.

Mission Sunehara Kal is a Water Conservation and Management Project with resource support from ITC Limited to address the problem of a fast depleting ground water table and water availability in the project villages. Efforts were made to improve livelihood conditions of farmers by adopting improved agriculture practices. The intervention context included the following attributes: Institution development & capacity building, participation and self-help promotion, sustainable water conservation and management, and agri-based livelihood development. The formation of a Village Development Committee (VDC) under the Gram Panchayat to take the responsibility of maintaining the water harvesting structures is a unique expression of the participatory process practiced at the grassroots.

The knowledge and understanding of participatory water conservation and management among the members of the community has strengthened local ownership of process and assets management, and helped in institution building efforts. Recognizing the role of women in water management, efforts were also made to involve them in the initiative. However, continued efforts are required to realise active participation of women in such development processes.

The role of the local communities as primary stakeholders, both as benefactors and those who stand to incur the greatest loss

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cannot be ignored. Mobilization of the community and their capacity building on various soil and water conservation measures emerged as the first approach. The knowledge gap among community members on sustainable agricultural practices, soil and water conservation measures etc. was minimized through a range of communication activities, demonstrations and exposure visits. 281 households over three villages were capacitated on the need for soil and water conservation measures. The second approach adopted was the physical implementation in terms of various soil and water conservation structures. Excessive runoff in the upper reaches of the catchment had resulted in soil erosion contributing to the formation of gullies. As a corrective measure 74 gully plugs have been built to reduce runoff and hence minimize soil erosion. Recharge of groundwater has been promoted through the construction of check dams, recharge pits and percolation tanks. With a water storage capacity of 36183 cum, the structures



Capacity Building of Key Statkeholders under the Project

serve the dual purpose of groundwater recharge and alternate sources of water (surface water). Enhanced recharged through construction of these structures would help restore declining groundwater levels in 29 tube wells and 3 dug wells in the project area.

The project focuses on long term results rather than short term achievements to increase the availability of water by undertaking many levels of interventions. Several water conservation, harvesting and ground water recharge structures are constructed and demonstrations of improved agri-horticulture technologies have been piloted in the project villages during the 13 months of the project period. There are tangible trends in terms of outputs and early impacts in the project villages such as a reduction in soil erosion, better availability of water, and improved livelihood choices at the village level. Thus, Mission Sunehara Kal Project has successfully demonstrated community based water conservation approaches, which can be replicated in similar situations elsewhere.



Low Height Recharge Struture Constrcutred at village Sarai in Mewat

## Concluding Ceremony of Water Conservation & Management Project and Exchange of Learning's

The Water Conservation and Management Project - Mission Sunehra Kal was jointly implemented by AFPRO and ITC in Sarai, near CGR Complex, Tauru, Mewat District (Haryana). The one-year project concluded in June 2011. On this occasion, a ceremony was organized in the village of Sarai to share the outcomes of the project with the benefiting communities. Mr. Balraj Singh Mor, District Collector of Mewat, was the chief guest of the ceremony. Mr. Mor expressed the need of water conservation in water stress situations. He appreciated the work carried out by AFPRO and ITC and urged communities to extend their support to these grass root organisations. Mr. Pradip Kumar from AFPRO highlighted the key interventions and the short and long term outcomes of water harvesting structures on the water table of the project area. Government official from Mining, Police, Agriculture and Forest attended the ceremony. Other than government officials, Mr. Ravi Puri, CEO & Mr. Atul from ITC Classic Golf Resort, Mr. Mukul Dixit, Deputy Director, Mr. Pradeep Kumar, PSC-NRM & Mr. Suresh Upadhyay, Sr Accounts Officer from AFPRO and Mr. Sarvashish Rai, Programme Manager, ITC, Jaipur also participated. Village communities, present in the event, were enthusiastic about the outcomes of the project that can be expected after this monsoon.



Deputy Commissioner of Mewat addressing at Concluding Ceromony of AFPRO-ITC Sunehra Kal Project

### Gravity Flow System: Effective Water Resource Management for Hilly Terrains in North-East India

- Tamal Biswas, Jr. Agri. Eng., AFPRO Task Force, Guwahati

A huge investment has been made by the Government on big dams across the country, but still a majority of small and marginal farmers depend on monsoon rains for agricultural activities, without access to adequate irrigation facilities. The absence of adequate and assured irrigation facilities make small and marginal farmers vulnerable, thus they are unable to earn sufficient livelihoods from farm activities. The situation of the North-Eastern States is not different from any other part of the country where in spite of a large number of farmers being dependent on agriculture, only 1.5% of the total food grain production of India is grown on 14.5% of cultivable land. Though these states receive comparatively good rainfall agriculture here suffers from the adverse effects of low productivity. The reasons for low productivity are mainly poor irrigation facilities, prevalent cropping practices, lack of support on technology and knowledge up-gradation.

A greater majority of farmers in hilly terrains are dependent on natural resources for agriculture. The potential for irrigation from natural resources needs to be tapped from the natural springs and streams present across the hilly terrains. AFPRO and Sir Dorabji Tata Trust (SDTT) is working on the project "Enhancing livelihood food security through Diversion Based Irrigation" to empower tribal farmers in 145 villages of Eastern and North-Eastern States, namely Jharkhand, Orissa, Assam, Meghalaya and Tripura. The selected areas are inhabited by tribal and marginalized communities. They are dependent on a single rain-fed crop and non-timber forest products for food. The project mainly aims at harnessing the natural flow of water and bringing the water upto the agricultural fields so that the farmer can cultivate the second (Rabi) crop. This will ensure food security for the villagers or the targeted tribal communities. By identifying the right water sources and connecting these to the farm lands through gravity based distribution systems, protection irrigation for both Kharif and Rabi crops can be ensured. Gravity based systems are simpler to operate and maintain than other systems of irrigation. The principle behind gravity flow systems is to harness the natural flow of water.

Under this project, small water holding structures such as check dams and guide bunds are built along a perennial stream at a higher altitude to carry water through underground pipelines to the agricultural lands of the villagers. These agricultural lands are situated at lower altitudes, thus a hydraulic head is created which forces the water through the pipeline. Since the stream is perennial, water is available for cultivation throughout the year. With the implementation of the first phase of the project in 6 villages, 19 water harvesting structures were constructed, resulting protective irrigation for 30 hectare of agricultural land. This has increased the crop production and has ensured the food security of the villagers. Together with this, training of farmers on appropri-

ate agricultural skills such as SRI, mixed farming, organic farming, crop rotation, and dryland farming will enable them to grow successful crops thereby further improving their food security. By ensuring long-term sustainability of such delivery systems, agricultural dependent livelihoods are significantly strengthened.

### Case Study from Umrnong Village, Meghalaya

Tribal dominated Umrnong village of Ri-Bhoi district in Meghalaya depends on rain-fed agriculture for livelihoods. The main crop grown in the village is Paddy other than some cultivation of winter vegetables. A year ago, the village was suffering from acute water scarcity both for drinking and irrigation purposes; and irrigation was limited to water availability in perennial streams. The villagers used stream water from a channel that was constructed long ago to meet their requirements. But due to large losses from seepage the channel invariably dried up and thus the villagers were faced with inadequate water availability for agriculture.

Looking at the resource potential of these areas, Umrnong village was selected for implementing the DBIS project with the aim to increase water availability, as well as, cropping intensity to ensure food security. The structure constructed under DBIS has ensured water availability during the lean period, thus encouraging the farmer to go for a second crop. Together with this, training to the farmers on appropriate agriculture skills enables the farmers to grow successful crops. Out of the total 45 families of the village, 18 families are benefited from the assured source of irrigation. A total of 21 acres of land has been brought under the cultivation of Rabi crop resulting in the expansion of cultivable areas. The crop production of the farmers has increased from 10% to 28.6% in the last year. This availability of water has encouraged the farmers for cultivating almost three times in a year. Along with creating structure that have boosted the livelihoods of the farmers. The concern of repair and maintenance has also been addressed under the project through the formation of Water User Groups (WUGs) comprised of benefiting farmers. A system of monthly contribution is being practiced by the group to ensure long term sustainability of the structures created.



The villagers excavating soil for laying of pipelines

## Ground Water Recharge to Overcome Water Stress – An Experience from PIKA Project

- AFPRO Head Office & AFPRO Lucknow Office

Uttar Pradesh (UP), home to 16.16% of India's population and thereby designated the most populous state of the Indian sub-continent, relies mainly on agriculture for its subsistence. As much as 73% of the state's population is engaged in the primary sector i.e. agriculture and allied activities, like horticulture, animal husbandry, dairying and fisheries. Yet, farming is ranked very low in the social order, as a majority of the farmers have either small (i.e. 1-2 hectares) or marginal (i.e. less than 1 hectare) land holdings and, as many as 40% of them are in debt either to the government, financial institutions or local money lenders. The main constraints faced by these farmers are the small size of the farms; poor quality seeds, pesticides & fertilizers; outdated agriculture technologies; lack of proper irrigation facilities (as a result of which 68% of the total cultivated area is rain-fed); inaccessibility to credit facilities & market systems; and poor organization among the farmers.

Small and marginal farmers of UP can be assured a means of having sustainable livelihoods, while traversing their journey towards reaching their full potential in crop production. It is with this in mind that the USAID funded 'Partnership for Innovation and Knowledge in Agriculture' (PIKA) project was designed and implemented in five Area Development Programs (ADPs) of World Vision India clustered in UP within five Districts. This project is designed to address the key constraints for enhancing agricultural productivity of small holder farmers. World Vision India in partnership with AFPRO, Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance (ACDI/VOCA) and Rice-Wheat Consortium (RWC) is implementing the project with the financial support of USAID.

One of the facets of this project is to ensure the sustainability of natural resources, mainly soil and water that are being depleted at an accelerated rate due to inefficient irrigation systems, overexploitation of groundwater (leading to a significant decline in water tables), soil salinity and soil erosion. This not only poses a threat to the production capacity of small-farmers, but to the agricultural sector of the Indian economy as a whole. AFPRO's contribution to the PIKA project was in providing the necessary expertise and technologies required to meet the key objective of project i.e. improved water resource management and soil conservation in the project areas. In this regard AFPRO undertook several measures, both structural as well non-structural, to effectively manage water resources and conserve the soil cover, with emphasis on replenishment of depleting groundwater, such that groundwater may be a sustainable source of irrigation for agriculture. Each of these measures has a significant role in restoring water levels and described briefly as follows.

|| **Pond Renovation:** It is the age-old practise of de-silting ponds by removing the impermeable layers of clay that collect at the bottom due to erosion and run-off from the surrounding areas. As a result, the ponds fill up with

rainwater which eventually percolates into the ground to refill the underlying aquifers. AFPRO successfully renovated 34 ponds during the course of the PIKA project.

|| **Construction of Check-dams:** By constructing check dams across waterways, as per the gravity dam model, water is restricted to the upper reaches of the stream; thereby increasing the residue time and the rate of infiltration. Two check dams were constructed in the two districts of Fatehpur and Barabanki.

|| **Field Bunding and Land Levelling:** Much of the techniques used by small-scale farmers to prepare their fields are rudimentary, resulting in challenges of soil erosion and inefficient water usage. By undertaking field bunding (i.e. erecting earthen ridges along the boundary of the fields) and land levelling activities, the rate of run-off of both irrigation and rain water will be reduced. As a result, the amount of water required for the crops will be reduced as opposed to the current trend of requiring excess water, due to uneven surfaces and unrestricted boundaries. 8456 m of bunds in 54 acres of land have been created under the project.

|| **Construction of rooftop rain-water harvesting systems:** The simple technique of collecting and storing rain-water from the roof of buildings, before it is lost as run-off, can prove to be an extremely effective measure for ground-water recharge. As a part of this project, 6 rooftop rain-water harvesting systems were constructed at school building in project area.

|| **Drainage Development:** In order to protect 68 acres of land from water logging in village Govindpur of district Hardoi 535 m long drainage channel was constructed for safe disposal of excess water. In addition, it also improves fertility and physical structure of soil thereby crop yield is enhanced. Similar initiatives need to be demonstrated and promoted in other areas where water logging poses a threat, particularly during the monsoon season.

As for the non-structural measures, AFPRO undertook several trainings, workshops, exposure visits and awareness drives, in order to educate the community about the need and importance of efficient water management and conservation. Many of these activities were undertaken in cultural forms through street plays, wall paintings and awareness rallies in the local language for easy understanding.

As a result, the water levels in the aquifers have seen a rise, as has the soil moisture content. This in turn has resulted in an increase in the agricultural production that is supporting livelihoods of at least 15000 farmer households in the area. Under the project, AFPRO has demonstrated that replenishment of groundwater in specific, and conservation of water resources in general can be achieved through simple yet extremely effective measures. Further, the model tested under the project needs to be adopted at a larger scale by institutions and communities to deal with emerging challenges of water table scarcity across the country. Government and Non-Government organisation support in promoting region specific water recharging measures at the local level will certainly replenish groundwater reserves and improve the livelihoods of the poorer communities.

### Community Participation in Watershed: Ensuring Sustainable Water Resource Management

- *Ashish Kumar Patel, Jr. Agri. Eng., AFU-III, Udaipur*

Under the Indo-German Watershed Development Programme (IGWDP), NABARD selected tribal dominated Anjeni village in Lasaria Block, Udaipur District, Rajasthan for watershed development activities. Rain-fed Agriculture and Livestock rearing are the main sources of livelihood of the community. The agro-climatic condition makes the village vulnerable to climatic variability. In collaboration with the local community, AFPRO provided socio-technical support to the NABARD watershed development programme during the pre-capacity building phase, with a view to achieve community participation for sustainability of the programme.

Watershed development refers to the conservation, regeneration and the judicious use of all the natural and human resources - within a particular watershed. Watershed management tries to bring about the best possible balance in the environment between natural resources on one side, and human and other living beings on the other.

As per of the programme activities, AFPRO mobilized, informed and motivated communities to actively participate in the capacity building and implementation phase of the programme. Community contribution (Shramdan) to undertake soil and water conservation work of common utility is the foremost step to begin any watershed programme based on IGWDP norms. The benefiting family from the watershed has to undertake minimum four days of work per eligible family to prove their willingness to participate in the programme.

AFPRO made conscious efforts to sensitize communities on the importance, as well as, need for watersheds in the present context. Initially it proved to be a difficult task to achieve the desired levels of participation, but after a series of meetings and orientations on the advantages of the watershed development programme, villagers came forward to support the programme components. An exposure visit of selected farmers to the Devpura watershed area provided an opportunity to physically verify the outcome of such programmes. As a result of social mobilization activities, the community realized the magnitude of the watershed and expressed their willingness to work unanimously for sustainable development of the watershed that was to be implemented in their village. The contribution by the villagers in terms of labour is estimated to be worth Rs. 1,00,490. After the successful completion of the initial phase, planning for the 'Capacity Building Phase' (CBP) of 101.40 ha of land area in Anjeni watershed region has been accomplished through a participatory approach. The participatory approach is a dynamic group process in which all the members of the group contribute to achieving common goals, share benefits accruing from the group activities, exchange information & experiences and follow rules & regulations underlined by the group.



*Community Contribution work in Baisakiya Hamlet of Anjeni Village*

Further, villagers discussed among themselves to design a plan to implement different activities in a participatory manner. Finally, members of the watershed have joined their hands together for sustainable livelihoods by adopting the watershed development approach.

For effective development of any watershed area and also for its sustainability, the participation of the community is essential, as it also ensures efficiency & cost effectiveness, equity in distribution of benefits, sustainability and empowerment of people. The interest of the poor and women also need to be protected by sharing benefits from such watershed development programmes with them. Watershed development is fundamentally about the creation of new opportunities in rural areas, in an institutional and ecological manner. The crucial indicators of success of any watershed development programme is the ability of the community to take advantage of the new opportunities and the extent to which these benefits are sustained in the post programme phase. As the community is the primary stakeholder in any watershed, the participation for ownership at local level can only bring long-term sustainability of watershed development programme.

### Announcement

**The International Food Policy Research Institute (IFPRI) has recently launched a food security portal to provide up-to-date information and analysis of emerging trends, challenges, and opportunities from local to national level on food security issues.**

**The interactive website provides breaking news and an ongoing discussion of food security based on latest research. This site also offers comprehensive agricultural, demographic, and economic profiles of 20 countries, including India, where hunger and malnutrition are severe. For more information, log on to <https://www.foodsecurityportal.org>**

### Pre SACOSAN-IV Meeting, Colombo, Sri Lanka

The Fourth South Asian Conference on Sanitation (SACOSAN-IV) was organised from 4<sup>th</sup> to 7<sup>th</sup> April 2011 in Colombo, Sri Lanka with the objective to accelerate the progress of sanitation and hygiene in South Asia and enhance the quality of people's life. The SACOSAN process is intended to develop a regional agenda on sanitation for generating political will to narrow the gap in sanitation access and usage. SACOSAN is largely a government led initiative that brings together key government officials, donors, NGOs and the media aiming to impact the country's sanitation policy through a signed declaration. The concept of Pre-SACOSAN meeting of Civil Society Organisations (CSOs), community activists and media personnel was first introduced before SACOSAN-III. The meeting provides participants a platform to articulate their position on sanitation in the region, later give the shape of a joint declaration which is circulated in the official conference of SACOSAN.

Realizing the importance of this CSO led process, Freshwater Action Network South Asia (FANSA), WaterAid and Water Supply and Sanitation Collaborative Council (WSSCC) had organized a two day Pre-SACOSAN-IV meeting of CSOs held on 1<sup>st</sup> and 2<sup>nd</sup> April, 2011 in Colombo, Sri Lanka. A mixed group of community leaders, NGOs and media persons working on sanitation and hygiene promotion from South-Asian countries, beside CSOs, representatives of WSSCC, WaterAid and DFID participated in this meeting. Since AFPRO's Field Unit in Ahmednagar is the nodal agency for managing the networking activities of the Maharashtra Chapter of FANSA, the organisation was also invited to share its stance on sanitation. Mr. S.C.Jain, Programme Coordinator represented AFPRO in Pre-SACOSAN-IV meeting.

In the meeting a country wise review was made on the progress of sanitation and efforts made by CSOs, as well as, governments after SACOSAN-III. A thematic discussion on exclusion and inequalities, school sanitation, monitoring mechanism, urban sanitation, sustainability, health and role of CSOs in the SACOSAN process was held to consolidate CSOs statement to SACOSAN-IV, recommending specific actions to be initiated by the South Asian National Governments. As an outcome of the Pre SACOSAN-IV consultation meeting a declaration was released highlighting time bound plans for delivering on all previous SACOSAN commitments, inclusion of rights to water & sanitation in national legislations, design of equitable & inclusive sanitation and hygiene programmes and mechanism for joint monitoring, participation, inclusion & social accountability .

### Training on Village Baseline Survey, organized by CCAFS, at Kisumu, Kenya

The CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) is a 10-year research initiative launched by the Consultative Group on International Agricultural Research (CGIAR) and the Earth System Science Partnership (ESSP). CCAFS seeks to overcome the threats to agriculture and food security in a changing climate, exploring new ways of helping vulnerable rural communities adjust to global changes in climate. The collaboration brings together the world's best research in agriculture science, development research, climate science and earth system science to identify and address the most important interactions, synergies and tradeoffs between climate change in agriculture and food security.

In order to better understand the current situation and to be able to assess the impact of interventions at a later date, CGIAR proposes to conduct a baseline survey of rural households and a village level survey in all its project areas, namely East Africa, West Africa and Indo – Gangetic Plains. AFPRO has been entrusted with carrying out the Baseline Survey for the CCAFS, in Punjab and Haryana, in India. As part of the CCAFS program, the Team Leader, Dr. Anish Chatterjee, Principal Research Coordinator, Climate Change and Livelihoods, AFPRO attended a training program on Village Baseline Survey, organized by CCAFS, at Kisumu, Kenya, between, 16 – 21<sup>st</sup> May, 2011. All the Team Leaders from East Africa (Kenya, Uganda, Tanzania, Ethiopia), West Africa (Burkina Faso, Ghana, Niger, Senegal and Mali) and Indo-Gangetic Plain (India, Nepal and Bangladesh), attended the 6 day training program. The training included familiarizing with Satellite Imageries, conducting Focused Group Discussions and Participatory Resource Mapping exercises.

We invite your comments and suggestion.

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Action For Food production (AFPRO) is a non-governmental , socio-technical development organization that has been working to reduce rural poverty in India since 1966. We provide technical guidance and back-up support to grass-root level NGOs in implementing environmentally sound food production, livelihood generation and related projects. Our core competencies are in land and water management, agriculture, livestock and fisheries, renewable energy and forestry. AFPRO reaches out to poor communities through 6 field units and 3 task forces, strategically located in 9 different states in India.