
**PARTICIPATORY IRRIGATION MANAGEMENT IN THE APWELL PROJECT:
INDO-DUTCH TEAMWORK**

R. Ratnakar

Associate Professor

Extension Education Institute

A N G R Agricultural University, Rajendranagar, Hyderabad – 500 030

Andhra Pradesh, India,

Former Consultant: Agricultural Extension and Training, APWELL Project
Tele: 91 (40) 24015368 (O), 91 (40) 55596330 ®, Fax: 91 (40) 24016367 (O),
09440063569 (Mobile)

ratnakar123@yahoo.com

S. Govardhan Das

Former Consultant Hydro Geologist, APWELL
Project, Hyderabad, AP, India

Abstract

The Andhra Pradesh Ground Water Borewell Irrigation Schemes (APWELL) project started in April 1995, with financial assistance from the Netherlands Government. Execution is by the Andhra Pradesh State Irrigation Development Corporation (APSIDC) of the Ministry of Irrigation. Technical assistance is provided by a consortium led by ARCADIS-Euroconsult (Netherlands). The project is being implemented in 7 drought prone districts of Andhra Pradesh and a total of 4476 wells have been drilled, of which 3460 are successful (above >1500 GPH), and have been commissioned. The project assists small and marginal farmers, organized into Water User Groups (WUGs) and Borewell User Associations (BUAs), with the construction and operation of sustainable small-scale borewell schemes. Activities are implemented through APSIDC, in partnership with Non-Governmental Organization (NGOs) and various line departments at district level. The Participatory Irrigation Management component of the APWELL Project aims to achieve the following: Strengthening the village institutions, improving the extension network and enhancing the skills of water users in social cohesiveness, village institutional management, gender balance, increased agricultural productivity, adoption of proper water management practices, hydrological monitoring, improved cropping patterns, and environmentally sound interventions in resource conservation. The participatory irrigation management process in the APWELL project has shown that farmer participation in irrigation management is viable and relevant. Women farmers have been especially empowered to participate fully in irrigated agriculture. Significant impacts are evident in the field.

Introduction

The Andhra Pradesh Ground Water Irrigation Schemes (APWELL) project started in April 1995, with financial assistance from the Netherlands Government. Execution is by the Andhra Pradesh State Irrigation Development Corporation (APSIDC) of the Ministry of Irrigation. A consortium led by ARCADIS-Euroconsult (NETHERLANDS) provides technical assistance. The project is being implemented in 7 drought prone districts of Andhra Pradesh i.e., Mahabubnagar, Nalgonda, Kurnool, Kadapa, Anantpur, Chittoor and Prakasam. As of 31 March 2003, a total of 4476 wells have been commissioned, of which 3479 are successful (above >1500

GPH).

The project assists small and marginal farmers, organized into Water User Groups (WUGs) and Borewell User Association (BUAs), with the construction and operation of sustainable small-scale borewell schemes. The project activities focus on land, water and crop management, groundwater resources development and hydrological monitoring, training and extension, gender balance and women in development, environmental sustainability, and monitoring and evaluation. Activities are implemented through APSIDC, in partnership with INDO-DUTCH consultant team, Non Government Organisations (NGOs) and various line departments at district level.

Purpose and objectives

The long-term objective of the project is to improve the living conditions of the small and marginal farmers in the project area.

The immediate objective is to assist small and marginal farmers, organized in water user groups, with the construction and operation of sustainable small-scale borewell irrigation schemes.

To achieve its objectives, the project aims for farmer managed borewell systems. This means involvement of the farmers in the conceptualization, planning, design, implementation, operation and maintenance as well as management of the borewell schemes.

Theoretical Base

Water is an important vital resource for economic development. It is projected that the present per-capita annual water availability of 2001m³ will reduce to the stress level of 1700 m³ in the next 2 to 3 decades. Further the projected reduction in the water availability to the agriculture sector from the present share of 89 to about 75 per cent by 2020 would adversely affect our capacity to produce more food.

It is well known that where land and water remains neglected, people remain poor. Land degradation affects equally the quantity and quality of water available. Forest denudation affects the hydrological cycle. Unscientific land use also leads to unsustainable exploitation of the aquifer. The global water crisis is likely to reach serious proportions soon, particularly in developing countries where the population density has already exceeded the limit of what natural ecosystem can support.

Water care leading to more productivity per unit of water consumed is vital for safeguarding food and livelihood security. Thus, the need to improve the present level of water use efficiency in general and for irrigation in particular assumes considerable significance in perspective water resource planning.

Project Methodology/Procedures

Development of participatory technologies

The success of any development project agriculture and rural development largely depends on people's participation along with support of research and extension services. The conventional top-down approaches have reduced the user clientele to the level of passive receivers instead of being actors of development planning and implementation. APWELL project realized the importance of participatory methods in identification and diagnosis of problems, development of technologies, adoption and execution where, farmers play the role of analyst, planner, and catalyst of change process and as change agents themselves. The basic philosophy

of the participatory technology development and irrigation management is to empower rural people to improve their standards of living through the identification and application of locally available technologies with the help of scientists and extension agents.

The participatory irrigation management component of the APWELL Project aims to achieve the following: Strengthening the village institutions, improving the extension network and enhancing the skills of water users in social cohesiveness, village institutional management, gender balance, increased agricultural productivity, adoption of proper water management practices, improved cropping patterns, including horticulture, sericulture and floriculture, and environmentally sound interventions in resource conservation.

Training and Extension – a participatory technology

Development of human resources for sustainable rural institutions is a continuous process in the APWELL project. Training and Extension is an integral part of the project activities. It is part and parcel of the capacity building of the staff of the implementing agencies and, target men and women borewell users. It is a gradual process that has been evolved from water user's and program implementer's needs at various stages of the project implementation through extensive participatory assessment and development exercise. To realize the objectives of project, training is imparted on various relevant and need based aspects.

District Training Unit (DTU)

The APWELL project's training strategy is to implement the training programmes of Water User Groups (WUGs), Women Self Help Groups (SHGs), Watershed Development Committees (WDCs) by the District Training Units (DTUs). District Field Coordinator (DFC), Agriculture Production Trainers (APTs), Hydrological Facilitator (HF), Gender Development Organisers (GDOs), Watershed Development Facilitator (WDF), and Community Organisers (COs), NGO representatives and the APSIDC staff are the members of the DTU in each District. DTU membership in the district varies from twelve to twenty. Thus the DTU is a multi-disciplinary team, comprising engineers, hydro geologists, social scientists, agriculture graduates, gender specialists, and grass root community organizers. A Training and Extension Consultant advises and supervises the DTUs. Selected Farmer Representatives (FRs) in turn pass on the skills to Water User Groups and Self Help Groups through extended training, exposure visits and interaction.

PIM – APWELL approach

The basic approach of the project is participatory to achieve the objectives. The participatory approach is predicted on the principle that “ people are the central purpose of development and human will and capacity are its most critical resource”. It is the involvement of the target groups in the conceptualization, planning, design, implementation, operation and maintenance as well as management of infrastructure and programs.

The project provided a unique experience to deal with real life situations in an innovative multidisciplinary and participatory approach. Most important innovative element of the project was to construct an irrigation system layout through a self-reinforcing participatory approach at a local level on the farmer's field itself.

Participatory irrigation system planning in APWELL

Over irrigation and wastage of water in the farmer's fields is the biggest bane of irrigation practice in India. Excess irrigation leads to excessive loss of water through runoff, seepage, deep percolation and evaporation. The intention of participatory irrigation system planning is to develop a proper water distribution system and obtain maximum crop production per unit of water from a unit of land in unit time.

Farmer's involvement from the beginning of irrigation system layout has increased their commitment for proper maintenance leading to sustainability. Further, the group management and joint ownership concept of APWELL project assistance to small and marginal farmers is playing a vital role towards sustainable agriculture and water utilization.

Crop planning

Just before the commencement of Kharif and Rabi crop planning by the members of WUGs with the guidance of APTs is an important activity in the APWELL clusters. Pre-seasonal crop planning meetings by the WUGs led to cultivation of less water requiring irrigated dry crops. The members of WUGs discuss about their borewell yields, availability of ground water, number of hours of power supply and decide about total extent of land to be cultivated, sowing/transplanting time, no. of irrigations required, time and duration of irrigations, crop and variety to be cultivated and local conditions etc. The WUG members discuss about the water requirement of various crops, and then they decide the crops and the extent. This process facilitates the equity and assured crop production to all the members of WUG.

Ground water depletion and reduction in borewell yields in general, WUGs and BUAs realized the role and importance of water and as a result, only 4 per cent of the APWELL ayacut (irrigated area) is under paddy cultivation.

APWELL farmers disproved the traditional practice of cultivating paddy, if water is available for irrigation. They realized that ID crops are more remunerative and sustain the ground water resources. Project trainings, and exposure visits convinced the farmers shifting from traditional seasonal crops to horticulture, fruit crops, floriculture, sericulture and vegetable cultivation.

Irrigation water management

After receiving ground water irrigation facilities, the APWELL farmers made an immediate shift from traditional crops and traditional practices to improved varieties and efficient irrigation methods which were imminent. APWELL organized field trainings in the villages conducting demonstration on improved irrigation methods suitable to local conditions. Exposure visits, demonstration and trainings on the improvement of traditional methods helped farmers controlling indiscriminate use of irrigation water. It has become a common practice among APWELL farmers to discuss and decide irrigation schedule based on crop, variety, sowing time, available soil moisture and moisture sensitive stages of crop. Members of WUG adjust their irrigation schedule considering these factors.

The APWELL farmers have become aware of the sensitive stages of crops commonly cultivated in the project area. There are ample evidences that many farmers schedule irrigation in such a way that crops do not experience any moisture stress during critical growth stages to obtain maximum possible yield from limited quantity of water

Logbook and water sharing agreement

Immediately after commissioning the borewell, the members of each WUG discuss the various possibilities of water sharing and probable conflicts of water distribution. It is a half day meeting of all the WUG members (applicants and co-applicants) facilitated by the DTU, discusses the issues related to borewell system operation, maintenance and water sharing, reach an agreement on logbook writing and water sharing. The water sharing agreement is written on stamp paper and signed by all the WUG members.

Participatory irrigation management, joint ownership of borewell and equitable water sharing is a unique activity in the APWELL project leading to suitable water utilization.

Electricity meters towards sustainable water use

APWELL is the first project in Andhra Pradesh that accepted to pay electricity charges per unit and water user groups pay 50 paise per unit. All project bore wells are installed with electricity meters along the side of panel boards. WUG members record the meter readings in the logbook provided to them. Farmers share the bills according to usage by the individual member for irrigating the crop/s. Modalities of sharing of power bills is discussed and decided by the WUG. This is mostly based on either number of hours used or number of units consumed. Contrary to the non payment of electricity charges by most of the farmers in the state, about 15000 farm families in the project agreed to pay and WUGs have already started paying the electricity bills as and when received.

No APWELL farmer wants to cultivate more water consuming crops, as they need more no. hours of power supply leading to consumption of more units and high electricity bills. Conscious use of irrigation water has led to arrest of water wastage.

Drip and sprinkler irrigation systems for documentation

Drip irrigation is slow application of water in the form of discrete or continuous or tiny streams of miniature sprays through emitters or applicators located at selected points long water delivery.

Sprinkler irrigation conveys water from the source through pipes under pressure to the field and distributes over the field in the form of spray of 'rain like' droplets.

Method demonstrations were conducted on drip irrigation by drum kit method, mini sprinkler customized drip and overhead sprinkler. Participants also visited other farmers' fields to observe the differences in irrigation practices between trained and untrained farmers.

Demonstrations are installed in the fields of farmers in 30 villages of 7 APWELL districts for training the APWELL farmers from other villages. Farmers using the efficient systems are sharing their experiences with fellow farmers.

Impact generated through participatory irrigation management

The participatory irrigation management process of the APWELL project has generated considerable impact. Select impacts are listed below:

1. Formation of Water User Groups and Borewell Users Associations with equal membership of men and women.
2. More than 230 Borewell User Associations in the project have been strengthened enough to manage their borewell irrigation systems and sustain the institutional set up.
3. The entire borewell irrigation ayacut is under Irrigated Dry crops, except 4% under paddy.
4. All Water User Groups have designed the irrigation system layout for their borewells in consultation with DTU members.

5. All the Water User Group members (both men and women) are able to operate their borewell irrigation system.
6. The training on borewell repairs and maintenance not only created self-employment opportunity for about 120 youth in the project area but also ensured availability of skilled persons for maintenance and repair of borewell irrigation systems, in all the APWELL clusters.
7. About 2500 acres of mango and citrus orchards have been planted and many more Water User Groups are planning to start horticulture.
8. About 1500 acres of the project area is under drip and sprinkler irrigation and many more are ready to use drip irrigation.
9. All the WUGs are preparing their crop cultivation plans in advance before kharif, rabi and summer (crop seasons) and implementing the same.
10. Farmers in about 100 villages in 8 major watersheds are monitoring rain fall, ground water recharge, extraction and balance, using rain gauge, water level indicator, stop watch and calibrated drum on a pilot basis.
11. WUGs in 200 villages producing vermicompost and adopting eco-friendly farm practices. The use bio-fertilisers, bio-agents and bio-pesticides.
12. Formation of over 550 women SHGs having funds of nearly Rs.30 million
13. All the APWELL farmers have collected soil samples from their lands and got tested at a local Government laboratory. Crops and soil amendments are planned based on these reports.
14. Water samples from the successful wells are being collected and tested for their suitability for crops. Soil treatment is undertaken wherever necessary.
15. IPM practices like reduction of pesticides, application of neem oil, bird perches, seed treatment, summer ploughing, pheromone traps, application of cow's urine, planting trap crops are being practiced in about 200 vilages.
16. WUGs in about 40 villages have taken up castor seed production in more than 1000 acres in 5 districts. Yields are atleast 4 times higher than the state average.

Conclusion

The participatory irrigation management process in the APWELL project has shown that farmer participation in irrigation management is viable and relevant. Women farmers have been especially empowered to participate fully in irrigated agriculture. Significant impacts are seen in the field and various inputs to increase productivity are being provided in response to continuous adoption of participatory approaches.

References

- Witjes, B., D. W. Raalten, and J. L. Plakkootam. 1999. Farmer Managed Borewell Irrigation Systems: Lessons for the APWELL Project.
- Plakkootam, J. L., 1997. APWELL Training Program Implementation Plan. January.
- Ratnakar, R., 1998. Training Component in APWELL Project.
- Ratnakar, R., and J. L. Plakkootam. 2000. Participatory Technology development in the APWELL Project. December
- Das, S. V. Govardhan. 2000. Participatory Hydrological Monitoring: An effective tool for community managed Ground Water. December.