IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

WATER MANAGEMENT IN AGRICULTURE

Dr.R.L.POONGUZHALI
ASSISTANT PROFESSOR OF ECONOMICS
ADM COLLEGE FOR WOMEN (A), NAGAPATTINAM

ABSTRACT

Those general difficulties are illustrated by our two case studies investigating options, stimulate and difficulties to improve water-efficient practices. The two areas have strong stimuli for improvement but lack a knowledge-exchange system to help farmers and resource managers identify scope for improvements. Partly for this reason, farmer's responsibility for efficient water management has been displayed to hypothetical prospects, e.g. extra supplies from reuse of treated wastewater or a long-term low water pricing. In both cases a displaced responsibility complements the default assumption that farmer's irrigation practices already have adequate water-use efficiency.

Keywords: Innovative, Irrigation, Practices, Water-Efficiency, Water, Users, Organizations, Shared, Responsibility, Knowledge-Exchange System.

Introduction :

The Water and Development Strategy was released in May 2013. The series of Implementation Briefs was developed to provide supplemental guidance in complement to the existing Water and Development Strategy Implementation Field Guide. The series of Implementation Briefs will provide additional information to facilitate and support programming decisions on the following key themes related to the strategy : WASH-Nutrition, Agricultural Water Management, Sanitation, Water quality and Sustainability of WASH services. Meeting the second strategic objective of the USAID Water and Development Strategy- Enhance food security through the sustainable and more productive management of water in agriculture - is critically urgent. Globally, agricultural accounts for the majority of freshwater withdrawals, with some water sources being drawn down faster than they are being replenished - and the push to exploit more water for food security in the face of the changing and more variable climate is increasing. In this Implementation Brief we present strategic approaches to improving agricultural water management.

Water Management in Agriculture

Agriculture is an important part of the nation's economy. The agricultural industry is one of the largest consumers of water globally. Water is used for livestock, growing of crops, irrigation and cleaning purposes. The production of meat requires the most water, while crops and vegetables have specific water requirements as they require a certain amount of water at certain times. Consumer demands drive their production of Agricultural Products in the changes in consumer preferences affect the amount of water and surgery for producing various food products.

Rainfall is their agriculture Industry's biggest source of water. The water needs of the various provinces are determined by the climate and the availability of irrigation infrastructure.

Water management is the activity of planning, developing, distributing and managing the optimum use of water resources. It is a subset of water cycle management. Ideally, water resource management planning has regard to all the competing demands for water and seeks to allocate water on an equitable basis to satisfy all uses and demands. As with other resource management, it is rarely possible in practice.

Economic water scarcity: Water scarcity can be both absolute and economic. Absolute water scarcity refers to a situation where the physical supply of water is below needs. Economic water scarcity occurs as a result of the inability to finance the costs of making use of available water from rainfall surface or ground sources.

Objectives Water Management in the Agricultural

According to the literature and field - visit experience they are.

- Increase and intensity production - increase production quantities and/or yields and allow for production during dry seasons, leading to greater surplus production and increased incomes;
- Reduce risk - Provide Protection from crop failure resulting from inadequate or unpredictable rainfall, leading to higher productivity.
- Diversify production - increase the diversity of products grown in order to increase value and market income and improve nutrition;
- Increase efficiency and save time - increase quantity and value produced in relation to water quantity, labor, and work time;

Effective Water Management in the Agricultural Industry

Proper Irrigation Management

Using environmentally friendly irrigation methods and effective operation and maintenance of equipment. Use knowledge of soils and landscapes to manage irrigation according to weather changes such as rain, wind and extreme heat and cold.

Water Saving Production Methods and Technologies

Adaptation of production methods to conserve soil to avoid water loss through evaporation and infiltration.

Reducing Water Pollution

Sound agricultural practices to reduce the discharge of pollutants and sediment to surface or groundwater. Educating workers and communities about water pollution that contaminates crops, soils and groundwater and transmitting diseases to workers and Consumers. Using water quality monitoring systems and minimizing the effects of Agricultural chemicals.

Strategy Around The Safe use of Wastewater

Investigating the feasibility of re-using wastewater according to location, climate and infrastructure. Recycling for wastewater and using properly treated and safely recycled water for cost-effective agricultural practices. In the year to come over dependency on water will intensify. All sectors will be expected to have plants and strategy in place to promote the responsible use of water. A sustainable agricultural management plan should incorporate environmental, social and socio- economic forces. Having enough quality water in this sector remains one of the greatest challenges we are facing.

Ensure Water Supply for a Secure and Economically Viable Agricultural

Agricultural water use is consumptive and irrigated agriculture will by necessity claim large quantities of water to produce food. However, water-saving technologies are available and can significantly reduce waste. Desalinated and wastewater are recognised as non conventional water sources. Solutions for sustainable allocation of water among users have to be secured.

Develop new Approaches in Agricultural Water Management

Huge investments have been made to develop existing irrigation systems. However system operation/maintenance and rehabilitation are under-funded in the public and private sectors. Reforming efforts include the institutional changes with the transfer of operation and maintenance responsibilities to water is associations, and new cost-recovery approaches.

Develop Pro-Poor and Affordable Agricultural Water Management

Low cost and small-scale options in water harvesting, irrigation and Drainage are necessary for small rural communities, Who may have to rely only on manual and animal power (example treadle pumps).

Mitigation of Environmental and Health Impacts of New and Existing Systems

Poor Irrigation and Drainage have led to water loss and also to the spread of Waterborne diseases, water logging and salinization of nearly 10% of the world's irrigation land, thereby reducing productivity. Improved design and management of irrigation and drainage systems in a priority.

Methods of Irrigation Systems

Irrigation is the artificial application of water to the land or soil. It is used to assist in the growing of agricultural crops, maintenance of landscapes, and revegetation of disturbed soils in dry areas and during periods of inadequate rainfall. Additionally, irrigation also has a few other uses in crop production, which include protecting plants against frost, suppressing weed growth in Grain Fields and preventing soil consolidation. In contrast, agriculture that relies only on direct rainfall is referred to as rain-fed or dryland farming. Irrigation systems are also used for dust suppression, disposal of sewage, and in mining. Irrigation is often studied together with drainage, which is the natural or artificial removal of surface and subsurface water from the given area. Irrigation has been a central feature of agriculture for over 5000 years and it is a product of many cultures. Historically, it was the basics for economics and societies across the globe, from Asia to the southwestern United States.

Drip Irrigation Systems

Drip Irrigation Systems are also known as Trickle irrigation, which proves to be one of the most preferred methods of irrigating. It is easy to install, inexpensive in utilising and helps in reducing disease problems that are associated with different levels of moisture and plants. It has also proved to be efficient due to factors such as the water being able to soak into the soil before evaporating. Secondly, the water directly drips to the roots of the plants, where it is needed rather than being sprayed everywhere, with the help of a number of pipes, tubes and emitters.

There are various types of drip irrigation systems. Some of them make use of small sprinkler parts to drip water to small types of areas while some of the systems utilize flexible tubing to drip water on the bottom of the plants. Some of them are :

Porous Soaker Hose Systems

This System is quite easy to operate and mainly used in hedges, rows of shrubs and garden beds, but might prove to be difficult to use in lawns. They are made of recycled automobile tires, which have numerous tiny holes in them. These porous hoses end up sweating water along their entire length and are very durable in Nature.

Emitter Drip System

This type of irrigation system is made of a number of hoses throughout the Garden. Each hose has a number of evenly spaced emitters in them, say about 15 inches apart. They end up releasing small drops of water into the soil and are particularly good for landscapes with shrubs. These emitters clog easily. It is the best way to avoid this by bringing these hoses inside during the winter season.

Watermatic Drip System

This is one of the most important types of drip irrigation system. This drop irrigation system helps in achieving water conservation by minimizing evaporation. It makes use of devices such as micro spray heads, which is used for trees and flower beds. This irrigation can even be utilized in areas of water conservation, where recycled water is used for irrigation purposes.

Micro Misting Sprinklers

These sprinklers are mainly built for vineyards and orchards, but are now starting to be used in backyards as well. This type of system provides water to the roots evenly, saving water and helping trees to increase their yields. One of their main advantages is that the mist helps in keeping the shallow roots cool and refreshes the flowers; protecting the bugs and flowers from the frost in the spring weather. Furthermore, they also prove to be quite inexpensive, 40 of them cost as much as one impact sprinkler. Though drip irrigation is very simple and easy to use, there are still some things which should be kept in mind such as the cost required for the purchase of this drip irrigation. It costs about 500 dollars to 1,200 dollars per acre. It might also prove to be very unsatisfactory, if the herbicides need sprinkling for activation. Therefore, redesigning your weed control program needs to be done. Drip irrigation can lead in increasing production, particularly in a place where irrigation has already taken place. In due course, there should definitely be an economic benefit to make drip irrigation worthwhile.

Sprinkler Heads

Impact and gear-drive sprinklers are two general types of sprinkler used in lawns, Gardens and pastures. They produce moving streams of water and spray nozzles that discharge water on the whole wetted pattern at all times. Impact or gear-drive sprinklers can accommodate only full or part circle application patterns. Since each springer covers a large area (typically 12 m head-to-head spacing), they are used on pastures and larger lawn areas.

These sprinklers may be used in a solid set configuration where sufficient nozzles are installed to cover all parts of the desired area drawing water from a surface or buried mainline and lateral. Or they can be used in set-move configuration Where lateral lines are operated and then moved at intervals of 12 or 24 hours. Solid set systems cost more to install, but have lower labour requirements and may be automated. The equipment and installation cost per acre of set-move systems is less expensive, but their operation requires more labour, as they cannot be completely automated.

Centre Pivot

This self-propelled sprinkler system rotates around the pivot point and has the lowest labor requirements of the systems considered here. It is constructed using pipes attached to movable towers. The amount of water applied is controlled by the speed of rotation. Centre pivots can be adjusted to any crop height and they are particularly

suited for lighter soils. With a computerized control system, the operator is able to program many features for the irrigation process. Furthermore, it is possible to install a corner attachment system (also called "End-Gun") that allows irrigation of Corner areas missed out by conventional Centre pivot systems.

Linear Move

The linear move (also called lateral move) irrigation system is built the same way as a Centre pivot; that is moving towers and pipes interconnecting the towers. The main difference is that all the towers move at the same speed and in the same direction. Water is pumped into one of the ends into the centre. Due to the high capital investment, linear moves are used on higher-value crops such as potatoes, vegetables and turf.

Travelling Big Gun

The travelling big guns system uses a large capacity nozzle and high pressure to throw water out over the crop as it is pulled through an alley in the field. Travelling big guns come in two main configurations : hard-hose or flexible-hose feed. With the hard-hose system, a hard polyethylene hose is wrapped on a reel mounted on a trailer. The trailer is anchored at the end or centre of the field. The gun is connected to the end of the hose and is pulled towards the trailer. The gun is pulled across the field by the hose winding up on the reel. With the flexible-hose system, the gun is mounted on a four-wheel cart. Water is supplied to the gun by a flexible hose from the main line. A cable winch pulls the cart through the field towards the cart.

Side Roll

The side roll (also called wheel roll) system consists of a lateral, usually a quarter Mile long, mounted on 4 to 10 foot (1 to 3 Meters) wheels in diameter and the pipe is serving as an axle. When the desired amount of water has been applied to an area, a gasoline Engine at the centre is used to move the side roll to the next. The sprinklers are generally mounted on weighted, swiveling connectors so that no matter where the side roll is stopped, the sprinklers will always be on top. This type of system is not recommended for gradients greater than 5 per cent and should be used mainly on flat ground. Side roll systems are adapted only to growing crops, have medium labour requirements and moderate initial investment.

Cost Considerations

The Cost of the different systems vary. Except for small sprinkler equipment for gardening, big systems such as linear move or Centre pivot irrigation Incur high capital costs. It is important to also consider operation and maintenance costs for these technical and sometimes computer controlled systems.

Operation and Maintenance

Depending on the system, expert knowledge is necessary to carry out irrigation. It is important to maintain the whole facility. Motors, water supply pipes/hoses and all mechanical components have to be kept in shape to avoid damage and high repair costs. The operation and maintenance of irrigation equipment for Gardens, such as sprinkle or spray heads, is not tricky and thus easy to handle for everyone.

Health Aspects

When water quality is very low (e.g. wastewater) and/or solvable fertilizer was added, workers should not stand close to the irrigated field to avoid contact with the water .

Conclusion

The North and the South India region possesses significant renewable water resources. Countries in humid India have available up to 200,000m^3 per person per year, and even more arid countries to the north with closer to

$2000m^3$ per person per year, are only withdrawing between 1 and 14 percent of their available resources. At the same time, the region suffers from persistent poverty (74 percent below the official poverty line) and not only repeated attention-grabbing famines, but also ongoing and widespread hunger and malnutrition. More than half of the population is rural, and around half of the total population is involved in agriculture.

Reference

1. Conway, G. 1997. The Doubly Green Revolution : Food for all in the 21st Century. London : Penguin.
2. Conway, G. and Waage, J. with Delaney, S. 2010. Science and Innovation for Development. London : UK Collaborative on Development Sciences.
3. De fracture, C., Principal Researcher, International Water Management Institute West Africa. 2011, 15 August. Interview by Sara Delaney.
4. Chan-Lizard, E., Chief Operating Officer, Kick Start. 2011, 11 September. Interview by Sara Delaney.
5. Agricultural Water for Africa (Agway). 2011.