



Guidelines for Efficient Agri. Water Management Financing



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1. Introduction

Living to the increasing food needs of our growing population, the agriculture sector of Pakistan not only employs majority of the rural population but also contributes around one-fourth to the country's GDP. Thus, development of this sector is vital both for economic growth and poverty alleviation.

Fortunately, the country has four seasons, all types of landscape, fertile land and one of the largest irrigation systems that irrigate over 16 million hectares of land out of 34 million hectares of cultivable land available. Its agricultural resources have the potential for meeting local needs and producing surplus for exports. But availability of sufficient water is a growing concern now. The country had abundant water in the 1950s, with a per capita water availability of more than 5000 m³ persons. By 2017, however, it will turn into a water scarce country. The per capita water availability, which is now around 1100 m³, would be around 1000 m³ by 2017. If timely steps are not taken for improving efficiencies in agri. water management, the result would be a shortage of 108 Million Acre Feet (MAF) and 151 MAF by 2013 and 2025 respectively.¹

Further, more than 50 percent of agri. water is wasted during distribution and field application before reaching crop root zone with losses mostly occur due to seepage, infiltration, leakages, etc. The seepage further results in water logging and salinity, which is a key factor in spoiling and impairing existing cultivable agricultural lands. Underground water, the second largest source of cultivation, is rapidly depleting due to over-drafting, causing the water table to go down. In addition, lack of knowledge about efficient use of agri. water resources is causing loss of soil fertility and per acre yield.

As such, climate changes, scarcity of usable canal water availability, wastage of water, and depleting underground water tables are the stumbling blocks in the growth of agriculture in the country. Adoption of modern water management techniques that ensure judicious water utilization for soil fertility and better yield are required more than ever. Some such techniques could be the streamlining of existing agri water management systems like lining of water channels/watercourses, construction of small reservoirs on the farm, use of tube wells, rain water harvesting, and adoption of new technologies. In addition, modern high efficiency irrigation systems like drip irrigation and sprinklers are also valuable. However, the selection of the type of intervention will vary depending on the source of water, type of land, the crop being cultivated, cost-benefit analysis and level of awareness to alternate techniques etc. A brief on these systems is as under:

2. Conventional Agri Water Management Methods

Lining of channels and watercourses are conventional methods used to plug seepage of canal or river water, whereas construction of small reservoirs helps to save rain water or additional water inflows that may be available during periods of water sufficiency. The stored water helps irrigation in periods with inadequate water supply. Proper management of these conventional methods reduces costs and improves efficiency; in addition, the water surplus can be used for increasing cropped area. The benefits of watercourse improvement are highlighted below.²

¹ National Seminar on "Water Conservation, Present Situation and Future Strategy" – May 2009

² Mushtaq Ahmad Gill (T.I.), South Asian Conservation Agriculture Network (SACAN)

Watercourse Improvement Benefits

Benefits	%age
Time saving in irrigation	28
Labor saving	50
Increase in cropping intensity	23
Increase in cropped area	17
Increase in yield	16-37
Increase in net farm income	20

3. Efficient On-farm Integrated Agri Water Management

The latest techniques used for improving efficiency of agri. water are drip/trickle and sprinkler irrigation systems. To make these more cost effective and sustainable, solar and windmill technologies are used for power generation to run the systems and for lifting underground water.

3.1. Drip/ Trickle Irrigation System

The concept of drip and trickle irrigation system is based on the maxim 'more crop per drop'. It is the most efficient agri. water management method in the world. The system delivers the required quantity of water and agro chemicals directly to the root zones of plants through a network of UV (Ultraviolet) resistant pipes and calibrated emitters (dripper, micro sprinklers). The soil near the root zone is always kept at "field capacity" which enables the crop to easily capture required water and nutrients, and grow healthier. Unlike other traditional methods, drip/trickle irrigation prevents moisturizing of whole soil profile and also saves water leaching and evaporation.

This system is quite popular around the world. A number of countries are shifting to drip irrigation technology for irrigating crops, saving water, improving irrigation & fertilizer use, protecting water logging, saving labor costs, increasing yield, etc. A comparison of drip vis-à-vis conventional irrigation system is given in the following table.

Determinants	Conventional Methods	Drip/Trickle Irrigation
Water savings	----	40-75%
Delivery losses	High	Negligible
Irrigation efficiency	30-50%	80-95%
Weed problems	High	Negligible
Water quality suitability	Only Fit	Saline to Fit
Disease and pests	High	Relatively Less
Fertilizer efficiency	Low	Very High
Water logging risk	High	Nil
Yield increase	----	20-100%
Produce quality	Normal	Excellent

Source: Directorate General Agriculture (Water Management), Punjab

Adoption of drip/trickle methodology can greatly improve water supply to major crops of the country such as cotton and sugarcane. It is also helpful in increasing production of vegetables, orchards, etc. as evident from the following table.

Crop	Traditional Irrigation Method (Per Acre)		Drip Irrigation Method (Per Acre)			
	Water Utilization	Production	Water Utilization	Production	Water Saving	Yield Increase
Cotton	6,500 m ³	25 maund	2,500 m ³	35 maund	62%	40%
Sugar Cane	16,500 m ³	700 maund	8,500 m ³	1,300 maund	48%	85%
Cucumber (Tunnel Farming)	2,800 m ³	550 maund	1,600 m ³	700 maund	42%	27%

Source: Jafer Brothers Pvt. (Ltd.) Brochures on Pilot Projects in Pakistan

3.2. Sprinkler Irrigation System

Sprinkler irrigation system is the method of providing water in the form of artificial rain i.e. water is distributed under pressure through pipes as a jet or spray into the air over the land to be irrigated. This does not require prior land leveling as needed under traditional irrigation methods. Sprinkler irrigation is extensively used all over the world to supply moisture to crops, frost control, crop cooling and application of pesticides, weedicides & fertilizers. This system is adaptable to all types of soil and is available in a wide range of water discharge capacity. Sprinkler system is designed to ensure maximum water saving, and combining features of high quality, affordability and ease of installation. Sprinklers provide efficient coverage for small to large areas and are suitable for a wide range of crops like wheat, gram, pulses as well as vegetables, cotton, soya bean, tea, coffee, fodders, nurseries, orchids and ornament plants.

4. Need for Guidelines

Credit availability is vital for any form of technology intervention. Lack of investment by banks in agri. water management projects is an indication of their apprehension regarding the risk of timely repayment, as shortage of water renders their clients (farmer borrowers) vulnerable to risks of yield loss or even the entire crop. Therefore, the guidelines for efficient agri. water management financing are aimed at sensitizing banks and the farming community to explore ways and means for adopting techniques that ensure optimum usage of renewable water resources. Main objectives of these guidelines are:

- To make efficient agri. water management techniques commercially viable for stakeholders including banks.
- To facilitate banks in developing products for efficient agri. water management techniques.
- To encourage and facilitate banks to provide working capital and term finance to farm and non-farm sector activities for utilization of efficient agri. water management technologies.
- To encourage farmers to adopt modern and efficient farming techniques.
- To increase the productivity of crops, fruits, vegetables etc. by adapting modern techniques.

5. Eligibility

Individuals and all types of legal entities engaged in crops, horticulture, floriculture and other agriculture production activities or desirous to establish such new projects with sufficient knowledge and relevant experience are eligible for loan under the financing scheme.

It is advisable that banks should have detailed understanding of and information about the borrower, his/her loan repayment capacity from projected cash flows/ other possible income streams besides capacity of borrower/ sponsor to manage and run the water management systems being financed.

6. Types of Financing

The financing will be provided to meet working capital and term finance requirements for purchasing of tools/equipments and running expenses of the agri. water management systems including the necessary toeing machinery for operating equipment, for example a tractor, etc.

6.1. Working Capital

To meet day to day expenses for functioning and maintenance of agri. water management systems, working capital financing can be provided on revolving basis for all activities including the following:

- Repairing/maintenance of lining channels, water courses, reservoirs, small dams etc.
- Running cost of drip/sprinkler irrigation systems.
- Purchase of spare parts, UV pipes, injectors, etc. in case of any damages.
- Overhead expenses i.e. labor, cost of oil/fuel for tractors and implements.
- Sprayers.
- Laser leveling charges.
- Charges for purchase of diesel & engine oil for tractor.
- Charges for purchase of diesel & engine oil for tube-well operation.
- Electricity Charges.
- All other items are related to these scheme/applications are eligible, covered under farm and non farm sector financing.
- Any other item required to meet day to day expenses for running of agri. water management projects.

6.2. Term Financing

The term finance facilities can be provided for medium to long term credit needs of the agri. water management system which may include the following:

Purpose	Period of Financing	Repayment	Ratio of Financing
For construction / excavation of ponds, watercourses, for lining of channels, water courses, reservoirs, small dams, etc.	For 5-7 years, as per life of the asset and policy of the bank.	Half yearly/ Yearly in equal installments (Principal & Markup).*	40% in case a farmer has obtained any funds from National Program for Improvement of Watercourses (NPIW), NGOs, other support programs, etc. for the same project/purpose. 80% in case if the farmer has not availed any financing/ funds from NPIW or other agencies for the same infrastructure/ project. 90% in case of group based lending and where subsidy from any agency has not been availed.
For installation of drip / sprinkler irrigation systems/equipments.	For 3 - 5 years, as per life of the asset and policy of the bank.	Half yearly/ Yearly in equal installments (Principle & Markup)*.	40% on balance payment in case the farmer has availed subsidy from Provincial/Federal Government/Other Agencies, etc for the same System / Equipments. 80% in case the farmer has not availed any subsidy for the same System / Equipments. 90% in case of group based lending and where subsidy from any agency has not been availed.
Purchase of Tractors, machinery/ equipment, tube wells, generator, etc. for applications of drip & sprinkler irrigation systems.	Development Loan as per existing policy of the bank and SBP Prudential Regulations for Agriculture Financing	As per policy of banks	As per existing policy of banks

Note: All auxiliary items relating to above water management scheme/applications are also eligible for financing as per existing agri. finance policies of the bank.

** Half yearly/Yearly equal installment will be fixed keeping in view the cropping pattern, repayment capacity of borrower and policy of the bank*

7. Fixation of Loan Limits and Repayment Terms

The loan limit shall be assessed by the bank keeping in view the borrower's profile, feasibility of the business, cash flow, etc. as per bank's credit policies. The bank shall also take into consideration any government or donor funding, if availed by the borrower and will allow balance payment as a loan to the farmer, net of government/donor subsidy or funds. Banks should undertake due diligence and market survey to assess the cost of equipment, vehicles and all other goods.

7.1. Mark-up

- Banks shall determine mark up rate keeping in view KIBOR rate and their cost of funds, etc. in line with their credit policy.
- Banks shall not charge any penalty on early repayment or adjustment of loans by the borrower.

7.2. Security and Collateral

Banks are advised to secure their financing, safeguard interests of the bank, and facilitate borrowers as per their lending policies. List of eligible security and collateral may include the following:

- Charge on agricultural land through the passbook system.
- Personal surety.
- Hypothecation/mortgage of assets, e.g. Tractors, Sprinkler irrigation system, Drip irrigation system, other machinery.
- Mortgage of rural, urban or commercial property.
- Pledge of SSC/DSC, lien on bank deposit, bank guarantee.
- Pledge of gold and gold jewellery.
- Individual/ Group Guarantee (maximum per person exposure as mentioned in PRs for agriculture regarding personal guarantee).
- Any other tangible collateral security acceptable to bank.

7.3. Insurance and other Documentation

Banks can secure their financing by obtaining documents as per their financing policies and SBP regulations/ guidelines / circulars. Completion of documentation formalities shall be the responsibility of the bank. Further, the assets should be comprehensively insured to safeguard the interest of the bank and the borrower from risks of losses due to circumstances beyond control of the borrower. It is advisable that banks should sensitize and educate their borrowers about the importance of an insurance cover for this purpose.

8. Loan Monitoring and Recovery System

Effective loan monitoring and recovery systems are critical for ensuring the quality of loan portfolios. The first recourse for the bank to recover its loans is the borrower and his/her cash flows. An effective monitoring system, follow-up, and frequent interactions with the borrowers are critical for ensuring recovery of agricultural loans. In addition to the traditional correspondence and letter/notice based recovery mechanism, banks may also initiate the following recovery process against delinquent borrowers:

- Persuading borrowers / guarantors through personal contacts.
- Issuance of legal notices.
- Recovery through Tehsildar /Mukhtiarkar/ after declaration of loans as Arrears of Land Revenue in accordance with Section 4(7) of Loans for Agriculture Purposes Act 1973 by the Collector / Asstt. Collector / Deputy Commissioner in case of financing against passbook.
- Filing recovery suits in Banking Tribunals/High Courts.
- Recovery in accordance with Financial Institutions (Recovery of Finances) Ordinance 2001.
- Any other legal remedies available to the bank.

Banks are required to develop sound and reliable loan monitoring and tracking system to ensure proper utilization & quality of loan and its timely repayments.

9. Compliance with Regulations

Bank shall ensure that financing for efficient water management is being made in compliance with SBP prudential/ other regulations for Agriculture Financing, including classification of non-performing loans.

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