

PC - I FORM (Revised 2005)
PRODUCTION SECTORS
(Agriculture Production)

COMMAND AREA DEVELOPMENT
OF
JALALPUR IRRIGATION PROJECT
(CAD-JIP)

(ADB Funded)

Project Cost:	Rs. 3,959.702 Million
Govt. Share:	Rs. 3,417.412 Million
Farmers Contribution:	Rs. 542.290 Million



(2019-20 to 2022-23)

DIRECTORATE GENERAL AGRICULTURE
(WATER MANAGEMENT) PUNJAB
LAHORE

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Acronyms and Abbreviations

DGA(WM)	Director General Agriculture (Water Management)
JIP	Jalalpur Irrigation Project
ADB	Asian Development Bank
CAD	Command Area Development
OFWM	On Farm Water Management
PGS	Punjab Growth Strategy
NCCP	National Climate Change Policy
PASP	Punjab Agricultural Sectoral Plan
SSCs	Supply & Service Companies
CADC	Command Area Development Consultants
WUAs	Water Users Associations
M&E	Monitoring and Evaluation
P&DD	Planning and Development Department
ERR	Economic Rate of Return
ADP	Annual Development Program
PIPIP	Punjab Irrigated-Agriculture Productivity Improvement Project
DA (OFWM)	Director Agriculture (OFWM)
DDA (OFWM)	Deputy Director Agriculture (On Farm Water Management)
ADA (OFWM)	Assistant Director Agriculture (On Farm Water Management)
WMO	Water Management Officer
WMS	Water Management Supervisor
ICR-I	First Intermediate Completion Report
ICR-II	Second Intermediate Completion Report
FCR	Final Completion Report
IP	Implementation Committee
DRC	District Rate Committee
CSC	Consultant Selection Committee
PCPS	Precast Concrete Parabolic Segments

1. NAME OF THE PROJECT

Command Area Development of Jalalpur Irrigation Project (CAD-JIP)

2. LOCATION

The proposed project will be implemented in Jhelum and Khushab districts.

3. AUTHORITIES RESPONSIBLE FOR

a) Sponsoring Agencies

- i) Asian Development Bank (ADB)
- ii) Government of the Punjab through Annual Development Program (ADP)

b) Execution

- i) Punjab Agriculture Department through Directorate General Agriculture (Water Management) Punjab, Lahore
- ii) Divisional Directors Agriculture (OFWM), Rawalpindi and Sargodha
- iii) Deputy Directors Agriculture (OFWM) Jhelum and Khushab
- iv) Private Sector Supply and Service Companies/ Service Providers
- v) Water Users Associations (WUAs)/ Participating Farmers

c) Supervision and Monitoring

- i) Directorate General Agriculture (Water Management) Punjab
- ii) Command Area Development Consultants (CADCs)

d) Operation and Maintenance

Water Users Associations (WUAs)/ Participating Farmers

e) Concerned Federal Ministry/ Provincial Department

Ministry of Water and Power/ Punjab Agriculture Department

4. PLAN PROVISION

a) If the project is included in the medium term/ five-year plan, specify actual allocation

The proposed project is in line with the development plans of the Punjab Government and has strong relationship with the Punjab Growth Strategy 2018, which envisages *On Farm Water Management (OFWM) as one of the components for achieving the targeted agricultural growth, which would be achieved through water conservation at the farm level by improvement/ rehabilitation of watercourses.*

The government vision for agriculture sector, alongwith other initiatives, encompasses water conservation and enhancing water productivity through efficient water conveyance, application, and optimal use. The proposed project aims at developing the culturable waste land for agriculture in newly constructed Jalalpur Canal command and promote irrigated agriculture with efficient utilization of limited water resources being made available from new canal system

through sustainable infrastructure development at the farm level to alleviate poverty in the project area by generating enhanced employment opportunities and maximizing farm profitability. These interventions will significantly contribute towards improving agricultural productivity and resultantly trigger the growth of rural economy. The project has, accordingly, been proposed to be included in the Annual Development Program (ADP) as per plan.

- b) **If not included in the current plan, how is it now proposed to be accommodated (Inter/Intra-Sectoral adjustment in allocation of or other resources may be indicated)**

Not applicable.

- c) **If the project is proposed to be financed out of block provision for a program or PSDP/ADP, indicate in Pak-Rupees?**

Not applicable.

- d) **If the project is not in the plan, what warrants its inclusion in the plan?**

Not applicable.

5. PROJECT OBJECTIVES

- a) **Sectoral objectives as indicated in the medium term/ five year plan**

The Sustainable Development Goals (SDGs) are comprehensive universal set of 17 goals and 169 targets/ indicators around which future development agenda of the world have been framed till 2030. Recognizing the key role of water in sustainable development, a standalone goal six of the SDGs has been dedicated to water unfolded as “*ensure availability and sustainable management of water*”. Goal six also speaks about substantial increase in water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity by 2030. Another target is to support and strengthen the participation of local communities for improving water management.

The strategies for conservation of water provided in the Punjab Growth Strategy (PGS), 2018 (page-73) envisages “*Water conservation at farm level through improvement and rehabilitation of watercourses*”. Similarly, the Punjab Agriculture Sectoral Plan (PASP), 2015 at page-47 provides that “*Adopt holistic approach focusing on all three elements of improving water efficiency including conveyance, application and use*”.

At national level, Pakistan Vision 2025 of the Ministry of Planning, Development and Reforms, Government of Pakistan recognizes sufficient, reliable, clean and cost-effective availability of energy, water for ensuring sustainable economic growth and development. It has been envisaged therein that *Pakistan needs a comprehensive water strategy that must combine the building of a substantial amount of additional water storage, minimization of losses in the conveyance system, and strengthening of the governance to implement effective policies to*

maximize crop yields per unit of water. It has also been planned in Pakistan Vision 2025 to "invest in proven methods and technologies to minimize wastage (e.g. in the agricultural sector), promote conservation and gain efficiencies". The proposed project is also inline with the National Climate Change Policy (NCCP) which envisages "ensure water conservation, reduce irrigation system losses and provide incentives for adoption of more efficient irrigation techniques" as one of the policy measures at page-4 under water conservation strategies.

As such, the proposed project activities are completely inline with the bigger sectoral objectives outlined in the SGDs, Pakistan Vision 2025, NCCP, PGS and PASP.

b) Project Objectives

The key objective of the project is to develop the culturable waste land for agriculture in Jalalpur Canal command and promote irrigated agriculture with efficient utilization of limited water resources being made available from new canal system through sustainable infrastructure development at the farm level to alleviate poverty in the project area by generating enhanced employment opportunities and maximizing farm profitability. The key objectives of the project would include, inter alia, the followings.

- i) Develop culturable waste land for agriculture through developing water conveyance network at the farm level*
- ii) Promote irrigated agriculture through sustainable OFWM interventions by utilizing limited available water resources from newly constructed canal system*
- iii) Enable farmers to operate & maintain smart irrigation water distribution system*
- iv) Develop capacity of participating farmers in better management of water and non-water inputs to maximize profitability*
- v) Alleviate poverty by generating employment opportunities, maximizing farm returns, and improving livelihoods in rural areas*

c) Sectoral Linkages/Relationship

The proposed project has a strong relationship with the objectives of the PGS, NCCP and Pakistan Vision 2025. Development of culturable wasteland and enhancing profitability of available water at the farm level are one of key objectives of the development and policy documents.

The proposed project would become part of the on-going On Farm Water Management (OFWM) program for development & rehabilitation of conveyance system at the farm level for improving its conveyance efficiency, promotion of improved water application & use methods/ technologies for enhanced profitability. The underlying objectives of proposed project are consistent with those of the agriculture sector that aim at enhancing profitability and transforming

Punjab's agriculture into a market driven, diversified and sustainable sector through integrated technologies, transparency and value for money.

d) In case of revised project, indicate objectives of the project if different from original PC-I

Not applicable.

6. DESCRIPTION AND JUSTIFICATION OF THE PROJECT

I) Background/Justification

Water has become the most important strategic resource for socio-economic development in the Punjab. It is key driver of provincial economy and plays an intrinsic role in rural development and its transformation to the economic uplift of the rural community. The Punjab's agro-based economy largely depends on irrigated agriculture as it accounts for about 28 percent of GDP and employs over 50 percent of labor force as well as contributes in the growth of other economic sectors by supplying raw materials to agro-based industry. About two third of the population resides in rural areas relying directly or indirectly on this sector for their livelihoods.

The river supplies are conveyed to agricultural fields through a network of main canals, branch canals, distributaries, minors and watercourses (**Figure-1**). The provincial irrigation system consists of 13 barrages/headworks, 22 main canal systems and about 60,000 watercourse serving to over 21 million acres of cultureable lands. Despite critical significance of water to the agriculture sector, expansion of water resources during last four decades did not commensurate with the population growth leading to food security and other risks. The surface water supplies are almost stagnant since Tarbela commissioning in 1976, as there is no major water resources development afterwards. The storage capacity is rather continuously declining due to silting up of reservoirs. Resultantly, the per capita water availability has decreased from over 5,000 m³ to around 1,000 m³ due to the burgeoning population. Pakistan's population is projected to be 221 million in 2025 and this increase combined together with changed living standards would require 40-50 percent additional food by 2025. This additional requirement can be met through increased crop yields and/or expanding the irrigated area, wherever opportunities exist.

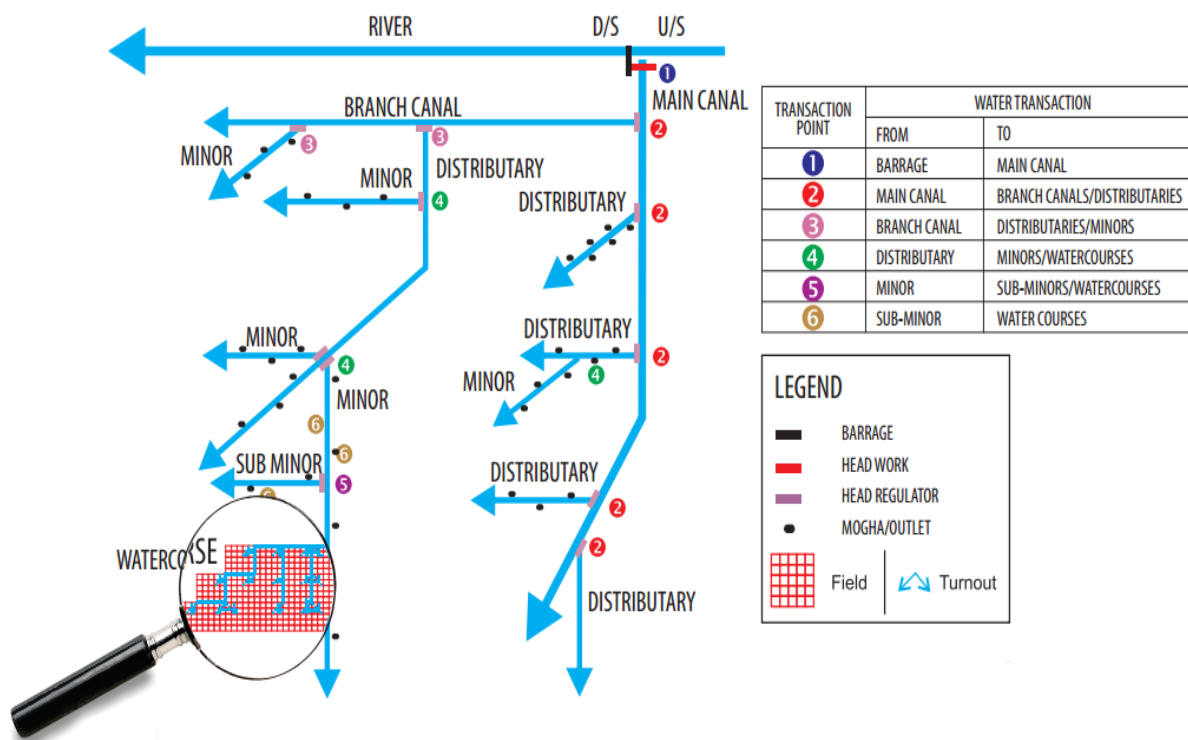


Figure-1: Typical Irrigation Network

The proposed Jalalpur Irrigation Project (JIP) is located between longitude from 72⁰-20' to 73⁰-31' (east) and latitude from 32⁰-25' to 32⁰-43' (north) along right bank of River Jhelum in the Punjab in Jhelum and Khushab districts. The project area is bounded by the salt range hills in the northwest and the River Jhelum in the Southwest. The groundwater and discharge brought by Hill Torrent is Saline. The project area is assessable through six lane Motorway and National Highway at two hour drive from the Capital Islamabad and three hour drive from the provincial capital, Lahore.

The proposed Jalalpur canal, a non-perennial irrigation system, would irrigate about 168,000 acres of virgin land located in Pind Daden Khan and Khushab tehsils for irrigated agriculture development. The proposed canal system comprises of 116 Kms long main canal and 210 Kms long 33 distributaries/ minors and about 485 outlets. Presently, farmers in the project area are practicing mainly rain fed agriculture and tubewell irrigation in patches. Dominant crops are wheat, cotton, rice, sugarcane, maize, fodder, potatoes, onion, vegetables, and citrus orchards. The crop productivity vis-à-vis farm profitability in the project area are low mainly due to lack of irrigation facilities, which often results in crop failures and secondary salinization.

II) PROJECT COMPONENTS

The main components envisaged for command area development of JIP include, interalia, the followings.

A. Community Watercourse Development

- A-1 Organization of **485** water users associations (WUAs) for mobilizing the farming community to actively participate in developments related to tertiary level irrigation network, farm layouts, rough / precision / LASER land leveling, and adoption of new water management interventions as well as marketing and value chain activities.
- A-2 Watercourse development through earthen construction of **485** watercourses in the command areas as per engineering design and lining of their critical reaches upto 50% of total length for efficient water conveyance to the farmer fields.

B. Improving Water Productivity

- B-1 Extend technical assistance to the farmers for farm layout planning and demonstration of precision / LASER land leveling on **30,000** acres in watercourse commands for improving water application efficiency.
- B-2 Installation of High Efficiency (drip/ sprinkler) Irrigation Systems on **2,000** acres for orchards, vegetables and other high value/ cash crops.
- B-3 Construction of **20** Water Storage Ponds and Solar Powered Pumping Stations for Irrigating Un-commanded Area in Outlet Command

C. Awareness Creation, Training, Capacity Development, Demonstration and Private Agriculture Support Services

- C-1 Awareness creation and capacity building of about **3,000** farmers/ water users associations/ other stakeholders for operation and maintenance of watercourses and adoption of improved OFWM interventions.
- C-2 Demonstration of suitable cropping patterns and provision of technical and financial support to the farmers for adoption of modern production technologies/ practices through extension services by the Extension wing of Agriculture Department
- C-3 Provision of Private Agriculture Support Services (PASS)

D. Command Area Development (CAD) Consultants and Project Management Support

- D-1 Command Area Development Consultancy (CADC) Services
- D-3 Project Management Support

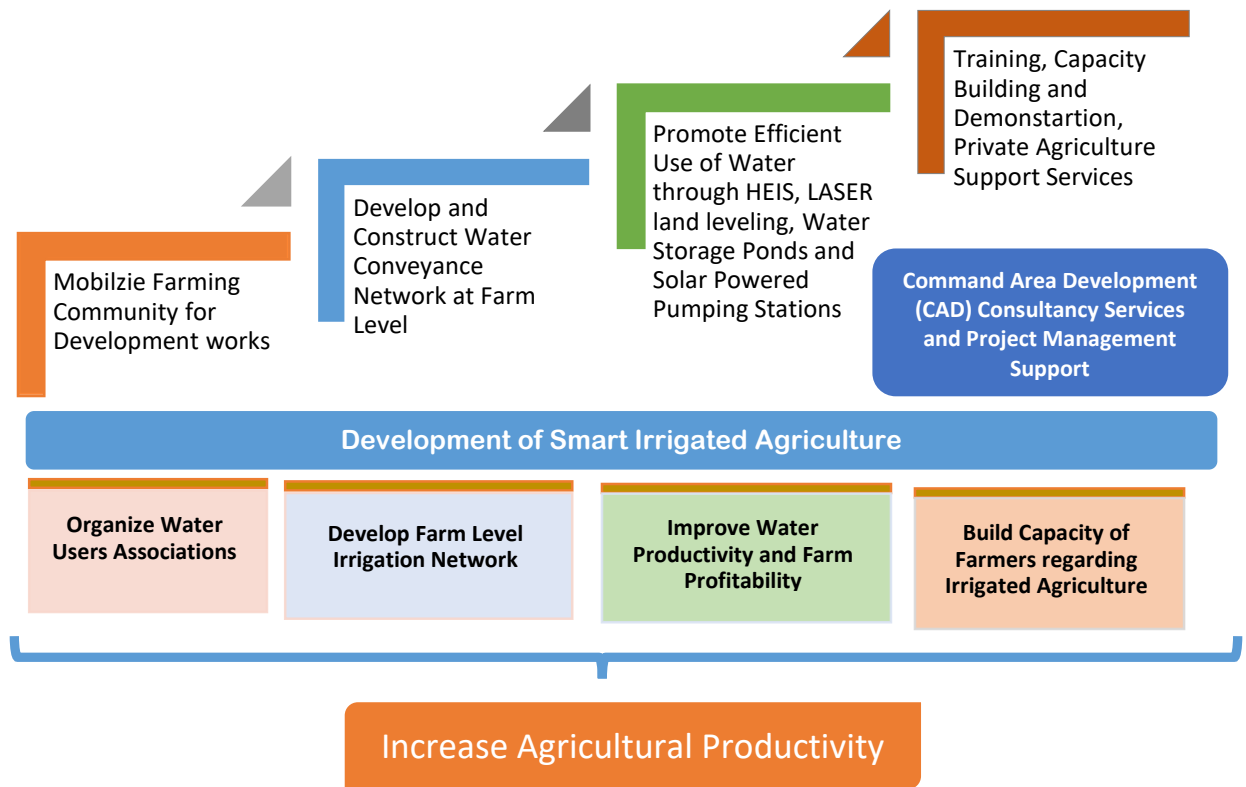


Figure-2: Conceptual Layout of Command Area Development Component of the JIP

The description of various project interventions/ components under the proposed command area development of JIP is given below.

A. Community Watercourse Development

This component will include social mobilization/ organization and registration of Water Users Associations (WUAs) and development/ lining of **485** watercourses in the command of Jalalpur Irrigation Canal.

A-1 Social Mobilization, Organization and Registration of Water Users Association

Effective involvement and participation of the shareholders acts as a catalyst for successful implementation of any development undertaking. The key of success of OFWM program in Pakistan is farmers' participation in execution of envisaged interventions. Peculiar feature of all OFWM projects is their community driven implementation approach. The OFWM staff has adequate capability and capacity to carry out requisite social mobilization for involving the farmers in implementation of proposed project as they have been successfully performing this function for almost past 40 years by organizing about 50,000 WUAs in the province for community watercourse improvement works. There would be one WUA for each canal outlet that will be

registered under the “On Farm Water Management & Water Users Association Ordinance [Act]-1981 (Amended 2001)” under the proposed project. The WUA will be the key institution for implementation of watercourse development activities with following key responsibilities.

- i). *Ensure right of way for earthen construction of watercourse*
- ii). *Arrange their share/ skilled and unskilled labour required for development of earthen channel, installation of water control structures, lining of critical reaches etc.*
- iii). *Procure construction materials for carrying out civil works*
- iv). *Settle matters of disputes amongst the water users in respect of channel excavation/ alignment, fixation of nakkas, distribution of work etc.*
- v). *Make alternate arrangements for conveyance of water during execution of improvement works*
- vi). *Carry out civil works in accordance with standards and specifications under the supervision of OFWM field staff*
- vii). *Undertake regular O&M of improved watercourses*

In addition, the WUAs would be encouraged to assume following functions.

- viii). *Undertake construction / improvement of farmers’ branches and field ditches*
- ix). *Participate in the process of water allocations and distribution (warabandi) within the watercourse command*
- x). *Install and carry out O&M of community tubewells*
- xi). *Develop surface/sub-surface on farm drainage facilities*
- xii). *Facilitate distribution of non-water inputs*
- xiii). *Access funding from various government and non-government organizations to carry out development works in agriculture sector including demonstration, seed/ fertilizer distribution, marketing, value chain etc.*



Figure-3: Glimpses of Water Users Association

A-2 Earthen Development and Construction of Watercourse Activities

The planning for any new command area development commences with the development of *Chak-bandi* plans, which mainly includes engineering *Chak-bandi* and revenue *Chak-bandi*. The establishment of tertiary irrigation distribution network starts only once these basic plans are finalized. The engineering *Chak-bandi* of a canal system involves division of its command area into various segments and attachment of each segment to a particular outlet at the parent channel (distributary / minor) on the basis of topography / contour lines for delivering irrigation water whereas the revenue *Chak-bandi* of an outlet involves on-site verification of the proposed command area, physical demarcation of the boundaries, mapping of land ownership, and preparation of lists of shareholders/water users. All these inputs and information contribute towards preparation of final map of each watercourse command, which sketches physical demarcation of channel layout, irrigated area, farm turnouts (naccas) etc. as well as ownership data/lists of water users.

Irrigation distribution network in proposed Jalalpur canal comprising of main canal, distributaries/ minors, and outlets as well as chakbandi plans would be completed by the Irrigation Department. The right of way of all the planned watercourses would also be provided by the Irrigation Department. The Irrigation Department would coordinate with the Agriculture Department for construction of outlets/ moghas and development of right of way. The Irrigation Department will provide all layouts and maps of the command area of each outlet/ watercourse for starting command area development activities in the area. The command area development

activities would jointly be carried out by the Water Management and Extension wings of the Agriculture Department.

The establishment of watercourse system is a pre-requisite to utilize the irrigation supplies being made available through proposed canal network. After construction of the outlets, finalization of chakbandi plans and determining the right of way by the Irrigation Department, the OFWM staff will carry out earthen construction of planned watercourses and subsequently/ simultaneously undertake lining of their critical reaches in the entire command of Jalalpur Canal. These works will be carried out through active involvement of the community by organizing them into Water Users Associations (WUAs) under “On Farm Water Management & Water Users Association Ordinance [Act]-1981 (Amended 2001). The watercourse development and construction process involves social mobilization of the water users for their active participation at all stages of works including organization / registration of shareholders into WUAs, collection of farmers’ share as their contribution in physical works, earthen construction of water channels, installation of water control structures, lining of critical sections etc.

The watercourse development/ construction activities to be undertaken by OFWM will involve following steps.

- i) Detailed bench mark, topographic, and profile surveys of entire command area
- ii) Designing and cost estimation for system layout
- iii) Construction of earthen channels
- iv) Installation of water control structures (nakkas, drops, culverts etc.)
- v) Lining of critical reaches of watercourses upto 50% of total length

It has been estimated by the JIP Consultants that each watercourse in Jalalpur canal command, on an average, would serve about 350 acres shared by over 50 farmers majority of farmers are absentees because presently there is no significant agricultural activity in the area. The watercourse development/ construction would, therefore, be tough task due to absence of owners, shortage of labour, non-availability of construction materials, massive earth movement, lack of adequate infrastructure etc. besides poor financial condition of the farming community. It is planned that cost for earthen construction of planned watercourses will be borne by the project, as no land has been acquired for watercourse right of way under the project and farmers are required to contribute land for the purpose, the government may provide financial assistance for earthen construction of the watercourse in lieu of cost of land for right of way.

A-2-1 Implementation Procedure

It is planned that execution of watercourse development and construction activities will be

carried out following the procedure already adopted/ approved under other OFWM development projects given hereunder.

- i) An awareness creation and publicity campaign will be launched in the project area about project facilities and process for participation in project activities;
- ii) The OFWM staff will coordinate with the Irrigation Department for identification of outlets, finalization of right of way of the watercourse and Chak Bandi Plan ;
- iii) The Irrigation Department will provide layout/ map of the command area of outlet/ watercourse, finalized right of way and Chak Bandi Plan to the OFWM ;
- iv) The Agriculture Department will pre-qualify private sector firms for supply of PCPS for watercourse lining or allow already pre-qualified firms to work under CAD-JIP;
- v) The field/ tehsil level OFWM staff will mobilize shareholders of the watercourses to organize into Water Users Associations (WUA). The same will be registered under OFWM and WUAs Ordinance [Act] 1981 (Amended 2001)/ rules;
- vi) The WUA will open a joint account to be operated by its Chairman and Treasurer in a Commercial Bank. The WUA will provide bank statement alongwith the specimen signatures of Chairman and Treasurer to ADA (OFWM) who will forward the same to DDA (OFWM);
- vii) The Deputy Director Agriculture (OFWM) will sign an output-based contract agreement with the WUA wherein, roles and obligations of both the parties will be defined. The agreement will be based on lump-sum contracts with payments linked with achievement of physical milestones as defined in agreement;
- viii) The OFWM staff in the project tehsils will conduct engineering surveys of the watercourse command area and prepare design and cost estimates in consultation with WUA that will be checked/verified by the Field Engineer of CAD Consultant;
- ix) The competent authority i.e. Director Agriculture (OFWM)/ Deputy Director Agriculture (OFWM) will accord Technical Sanction of planned works;
- x) The WUA will hire labour for earthen construction and lining of watercourses from the market on rates notified by the government for the district;
- xi) The WUA will invite quotations from at least three pre-qualified PCPS firms for supply of PCPS only or alongwith their installation cost and recommend award to the lowest evaluated quoting firm/supplier in consultation with the OFWM field staff;
- xii) The WUA will carry out earthen construction of proposed length under the supervision of OFWM field staff. This will involve removal of shrubs, bushes, and vegetation as well as other natural or man-made obstructions from the right of way. It will be followed by filling of low spots in the right of way, constructing a well compacted pad, and excavation of channel as per engineering design;
- xiii) After completion of 80% of earthen construction of watercourse, the WUA will install water control structures and carry out lining of critical sections of the watercourse;
- xiv) The requisite funds from Specified Account/ Cost Centers will be released into joint account of the respective Water Users Association by Deputy Director Agriculture (OFWM) in three installments on recommendations of the CAD Consultants as per following criteria;

First Installment

Release of 50 percent cost of earthen construction and 40 percent of the estimated material cost on receipt of First Intermediate Completion Report (ICR-I) from the consultants certifying the following requirements.

- Issuance of Technical Sanction by the competent authority
- Deposit of 50 percent farmers' share on account of labour charges for lining and installation of water control structures
- Earthen construction of at least 80 percent of designed watercourse

Second Installment

Release of remaining 50 percent cost of earthen construction and 30 percent of the estimated material cost on receipt of Second Intermediate Completion Report (ICR-II) from consultants verifying followings.

- i. Deposit of remaining 50 percent labour charges of farmers' share on account of lining/installation of water control structures etc.
- ii. Development of entire designed earthen sections.
- iii. Completion of at least 30 percent planned lining and other works.

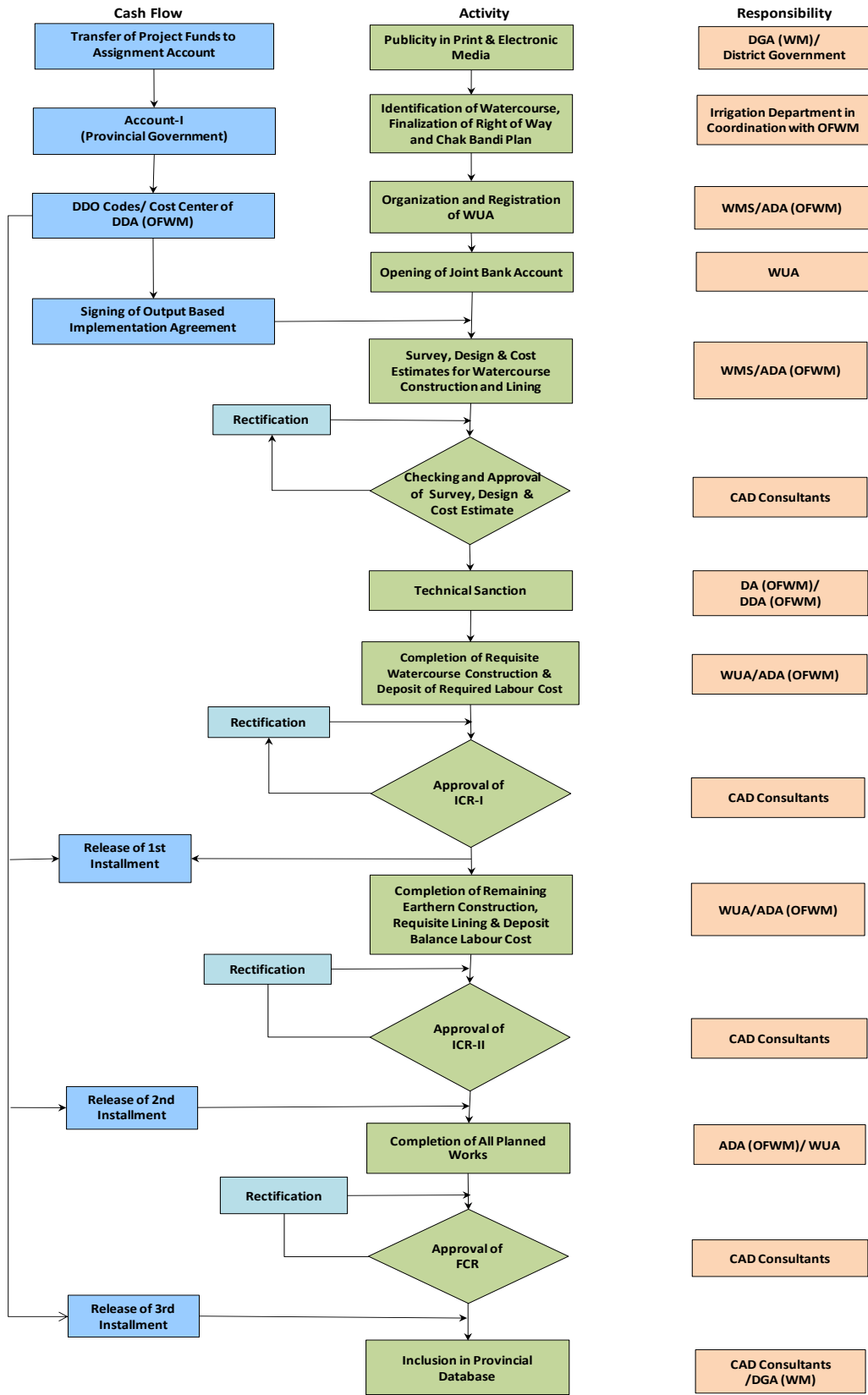
Third Installment

Release of remaining 30 percent of the estimated material cost on receipt of Final Completion Report (FCR) from consultants certifying following factors.

- i. Completion of all planned works.
 - ii. Rectification of any pending discrepancy.
- xv) The requisite funds for watercourse construction and lining/ improvement under the proposed project will be transferred from provincial Account-I to Cost Centers/ DDO Codes of respective DDA (OFWM) with the authorization of the Finance Department
- xvi) The funds from Cost Centers/ DDO Codes will be released by the Deputy Director Agriculture (OFWM)/competent authority into the joint account of respective WUA in three instalments on recommendations of CAD Consultants as per above said criteria

The implementation process showing various stages of implementation, responsibility of the activities and cash flow is presented in **Figure-4**. The schematic process for improvement of watercourse in pictorial view is shown in **Figure-5**.

Process Map for Watercourse Construction and Improvement/ Lining



DGA (WM) : Director General Agriculture (Water Management)
 DA (OFWM) : Director Agriculture (OFWM)
 ADA (OFWM) : Assistant Director Agriculture (OFWM)
 ICR: Intermediate Completion Report
 DDO: Drawing and Disbursing Officer

OFWM : On Farm Water Management
 DDA (OFWM) : Deputy Director Agriculture (OFWM)
 WMS : Water Management Supervisor
 FCR: Final Completion Report
 CAD : Command Area Development

Figure-4: Schematic Process for Watercourse Improvement under JIP



Figure-5: Watercourse Improvement Process

A-2-2 Lining Techniques

The standard lining technique executed under previous OFWM projects has been a rectangular shaped channel constructed by using double brick masonry walls (23 cm) and a brick masonry floor (07 cm) plastered inside and on top of the walls. This type of brick lining has been adopted since inception of OFWM program mainly being easy to construct. However, under continuous rise in demand for bricks, little price control, and day by day dwindling quality of bricks, there was dire need to adopt lining alternatives to overcome the multifarious problems being faced in the field. The Precast Concrete Parabolic Segment (PCPS) lining has been approved as alternate lining technique being hydraulically more efficient, durable and quick in installation. It is planned to adopt PCPS lining option for watercourse construction/ lining under the project.

A-2-3 Lining Percentage

The soils of the project area are mostly light where earthen watercourses will not be stable on the first instance and will loose too much water because of excessive seepage, if any how could stay. Moreover, the groundwater in most of the project area is saline. The lining of watercourses under the proposed project would, therefore, be carried out upto **50** percent of total length of community channel as per existing policy of the Punjab Government.

A-2-4 Cost Sharing

There is either no agricultural activity in the area at present or all the farmers are practicing agriculture below subsistence level. As such, a farmers' friendly cost sharing approach needs to be adopted for execution of watercourse development activities keeping in view their financial capacity. The following cost sharing mechanism is, accordingly, proposed for earthen watercourse construction, installation of water control structures, and lining of critical reaches.

- Farmer will contribute their requisite share for labour and mason costs for installation of water control structures, construction of culverts/ animal wallow / drop structures, lining of critical sections and back earth filling of water control structure and lined sections
- Government will bear entire cost for earthen construction of watercourse and all construction materials

B. Improving Water Productivity

This component will comprise of farm layout planning and precision / Laser land leveling, installation of high efficiency irrigation systems and construction of water storage ponds & solar powered pumping stations for irrigating un-commanded area in outlet command of Jalalpur irrigation canal.

B-1 Farm Layout Planning and Precision / LASER Land Leveling

The experience of implementation of various OFWM projects has revealed that proper farm planning and layout designing are foremost for bringing new lands under irrigated agriculture. Detailed survey of the farm area is conducted for layout designing by considering various factors e.g. topography, soil types, available irrigation supplies, cropping patterns to be followed etc. Afterwards, rough and / or precision land leveling (PLL) of various plots is undertaken by grading and smoothing the land to a uniform plane surface at grade or no grade (zero slope). Initially, traditional method of leveling the land is used that involves earth movement with bucket type soil scrapers and tractor mounted rear blades. This is followed by bringing the plots on more uniform level with variations of less than ± 20 mm (2 cm).

Use of LASER technology in the precision land leveling was introduced in the Punjab during 1985 through On Farm Water Management program. The same has been proved to be highly beneficial because it minimizes cost of the operation, ensures better degree of accuracy in much lesser time, saves irrigation water, ascertains uniform seed germination, increases fertilizer use efficiency, and resultantly enhances crop yields.

Keeping in view low water allowance and light nature of soils in Jalalpur canal command area, it is imperative to develop strategies for efficient utilization of available water resources. Introduction/ demonstration of LASER land leveling technology can contribute a lot to improve water productivity in the project area. It is planned to level about **30,000 acres** of land through LASER technology under the proposed project, which would be supported by farm planning and designing services as well as introduction of improved irrigation agronomic practices. Although LASER land leveling technology has been demonstrated effectively among farming community and its benefits have been acknowledged in irrigated areas of the province, there is still need to demonstrate the technology in the newly developed project area.

The impact assessment carried out by the Monitoring and Evaluation Consultants of the Punjab Irrigated-Agriculture Productivity Improvement Project (PIPIP) for LASER land levelers provided has shown following results.

- ◆ *Saving in irrigation time: 20-30 percent*
- ◆ *Improvement in crop yield from 9-11 percent*
- ◆ *Enhancement in fertilizer use efficiency: 11 percent*
- ◆ *Saving in farm labour: 18 percent*
- ◆ *Facilitation in better crop stand, uniform moisture availability and enhanced fertilizer use efficiency*
- ◆ *ERR 29.6%*
- ◆ *B/C Ratio 1:1.5*

B-1-1 Implementation Procedure

It is planned to register / pre-qualify the service providers for provision of LASER land leveling services in the project area amongst those who have LASER equipment provided either through government schemes or procured at their own. The bid/ financial proposal for LASER land leveling works for specific area and/ or period would be invited from amongst pre-qualified service providers through local shopping procedure and planned works would be awarded to the lowest bidders. The payment of subsidy amount would be made to the service provider directly after verification of LASER land leveling works by the CAD Consultants. The farmer contribution would be paid directly by the farmers to the selected service provider. The proposed implementation process showing various stages of implementation, responsibility of the activities and cash flow is presented in **Figure-6**.

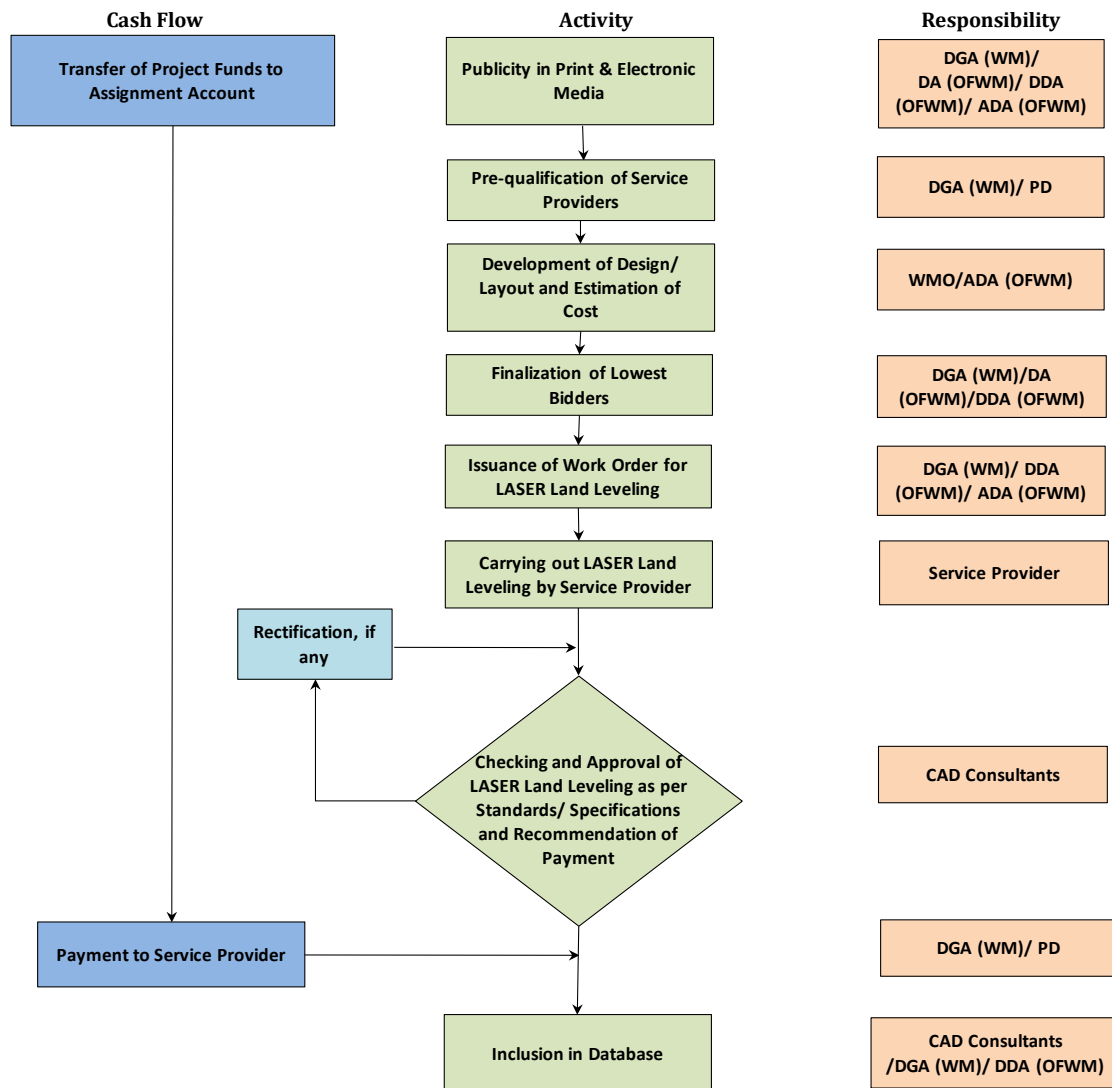


Figure-6: Proposed Implementation Procedure for LASER Land Leveling

B-1-2 Cost Sharing

It is estimated that it costs about Rs. 6,000 per acre for LASER land leveling. Accordingly, it is planned to provide financial assistance @ Rs. 4,800 per acre (80%) for LASER land leveling and remaining 20% cost (Rs. 1,200 per acre) will be borne by the beneficiary farmer. It would, however, be prerequisite for the farmers to carry out rough land leveling of their fields at their own to get financial assistance for LASER land leveling.

B-2 Installation of High Efficiency Irrigation Systems

It is well established fact that irrigation water is the most critical factor in crop production and its efficient use enhances productivity of other non-water inputs as well. The Punjab is facing severe shortage of irrigation water for last many years on one hand and there is inefficient use of available resources on the other. The same is resulting in much lower agricultural productivity from highly productive resource base of the province. High efficiency irrigation systems have been found water and nutrient efficient and most appropriate option to address various crop production issues.

Drip, bubbler, conventional sprinkler, rain-gun, center pivot etc. are together referred to as high efficiency irrigation systems (HEISs) which use pipes for conveyance of water from the source to points of use. In drip or trickle irrigation, water is provided to individual plants by means of small emitters in the form of droplets. Bubbler irrigation is very similar to trickle irrigation except that the water is delivered to the plants through micro sprinklers mounted on small spikes. In rain-gun irrigation systems, water is pumped at high pressure through a piped system and sprayed over the field.

Drip irrigation also called as trickle/micro irrigation is the most efficient technology that makes highly effective use of water, fertilizers, and nutrients. Its main principle is to apply water and other inputs slowly, regularly, and frequently as close to the plant roots as possible according to plants requirement through emitters installed on plastic pipes laid out in the field. Regular and timely availability of nutrients throughout the plant growth period as per exact requirements and maintenance of favorable soil moisture conditions facilitate to maximize crop productivity. Drip irrigation technology is best suited for orchards and high value row crops such as cotton, maize, sugarcane, vegetables etc. It has become the most valued innovation, which optimizes use of water and fertilizers by enhancing the irrigation efficiency as much as 95 percent. It is planned to keep

all options open for high efficiency irrigation systems in the project area including drip irrigation, rainguns, hose reel system, center pivot etc. based on site specific technical feasibility.

The M&E consultants of the World Bank funded PIPIP have revealed that HEIS installations so far under PIPIP have created very visible impact in terms of water saving, reduction in fertilizer use, and crop productivity enhancement alongwith facilitating crop diversification, value addition and increase in employment. The overall impact of HEIS technologies reported by M&E Consultants is summarized below.

◆ Water saving	40-50%
◆ Enhancement in crop yields	10-100%
◆ Reduction in fertilizer use	10-50%
◆ Net farm income increase per acre per annum	PKR 75,000
◆ Early picking of vegetables	10-15 days
◆ ERR	35.1%
◆ B/C Ratio	1: 2.1
◆ Maturity of orchard one-two year earlier	
◆ Crop diversification (from grains to horticulture)	

B-2-1 Eligibility Criteria

The farmers will be invited to apply for grant of financial assistance upto maximum 15 acres for installation of HEIS in the project area and following eligibility criteria would be adopted.

The farmer

- a) has an assured/reliable water source either in his own right or under contract arrangements from neighboring farmers. While assessing the water availability, multiple sources should be considered instead of assessing from only one source;
- b) agrees to contribute remaining cost of system installation other than provided by government. It is assumed that cost of system would cover the complete installation of various items depending on specific situation where system is to be installed;
- c) is willing to mobilize post installation operation and maintenance expenditure;
- d) undertakes to provide support and assistance to the project staff, supply & services companies, and consultants during their activities pertaining to the site surveys, installation of equipment, and other civil works and during post installation services;
- e) is owner/tenant/lessee and self-cultivator of land (in case of absentee owner, there should be well-versed farm manager);
- f) is not defaulter of any revenue/financial institution;
- g) will not remove or transfer the installed system and ensure its operation minimum for three years after installation;
- h) agrees to get the operator of irrigation system trained in operation, trouble-shooting/repair & maintenance from SSC/government;

- i) agrees to be solely responsible for HEIS equipment safety after its delivery and installation;
- j) agrees to abide by any other condition/ decision specified by the government or the designated committee; and, will not challenge it in any court of law.;
- k) will arrange material prior to issuance of work order for inspection by the project consultants in case, he/she wants to contribute “in kind material” towards farmers’ share.
- l) agrees to sign a tripartite agreement before issuance of works order; and
- m) will be liable to pay full amount of financial assistance received for the purpose as arrears of land revenue in case of violating any of the conditions specified by the government.

B-2-2 Cost Sharing

It is planned to demonstrate high efficiency irrigation systems on only **2,000 acres** in the project area for promotion of high value crops including vegetables, orchards, and other cash crops based on site specific requirement and technical feasibility. It is planned that the government assistance under the project would be 80 percent of total system cost for installation of HEIS on upto 15 acres while the remaining expenditure (20 percent) will be contributed in cash/ kind by the participating farmers. The farmers may also join through a contract agreement to share the water source/storage pond, head unit and pipe networks to economize the system costs. Under such arrangements, each joining farmer will be eligible for financial assistance upto upper ceiling of 15 acres. The mechanical move HEIS like center pivot system, linear move system, reel type system etc. are generally suitable for large areas exceeding the project ceiling limit of 15 acres. In this case, group of farmers may join together under contract agreement to avail project subsidies for 15 acres by each participating farmer. The subsidy would, however, be limited to single setting acreage of such HEIS. The project subsidy shall be agreed per acre rates for reimbursements from the donor/ Asian Development Bank for 15 acres category or 80% of the actual cost, whichever is lower.

B-2-3 Implementation Arrangement

Installation of HEISs would be carried out through supply and service companies (SSCs) to be pre-qualified by the Agriculture Department, who would be responsible for carrying out surveys, preparation of designs & cost estimates, installation/ commissioning of systems and provision of post-installation backup support services. The sequence of implementation activities for installation of HEIS is given as under:

- i) The Agriculture Department will shortlist/ pre-qualify the supply and service companies (SSCs) and will invite the financial proposals from the pre-qualified SSCs for installation

of HEISs on specific area/ farm. The works for installation of HEIS will be awarded to the SSC having lowest financial bid for specific area/ farm.

- ii) The district/ tehsil/ field OFWM staff will mobilize the farmers for adoption of HEISs. Interested farmers will submit application and/ or approach the concerned Assistant Director Agriculture (OFWM)/ Deputy Director Agriculture (OFWM) for installation of high efficiency irrigation systems on his/her land during any time of the year;
- iii) The applications will be scrutinized against eligibility criteria and selected SSC will be asked for survey, design, and cost estimation of the selected system. In case of more demand than the district quota/target, balloting process will be conducted at the district level by involving Director Agriculture (OFWM) and representative of DGA (WM)/ Project Director;
- iv) The selected SSC will survey the site, prepare design and bill of quantity (BOQ), and submit the same to the Deputy Director Agriculture (OFWM) who will forward the same to the Command Area Development Consultants (CADC) for review and approval. The farmer, after approval of design and cost estimates, will be advised by the concerned Deputy Director Agriculture (OFWM) to deposit his/her entire share in the form of pay order/bank draft drawn in favor of selected SSC or evidence of in kind contribution by the farmer, which will be transmitted to Director General Agriculture (Water Management)/Project Director for issuance of work order;
- v) Farmer may be given option to contribute “In Kind Material” towards his share (up to maximum of 20%) by providing material as per approved standards and specification. In this case, farmer will purchase new material according to standards and specifications and will get the same verified by the Consultants. On certification by the CAD Consultants that “in kind” material delivered at site meets the project standards and specifications; and, deposition of remaining farmer’s share, if required, the work order shall be issued;
- vi) After receipt of in kind/ cash farmer share, Director General Agriculture (WM)/Project Director will issue the work order and advise the concerned SSC to supply the HEIS equipment/material at site, which will be verified by the CAD Consultants for quality and quantity vis-à-vis approved standards/specifications;
- vii) On receipt of satisfactory report from the Project Consultants, DGA (WM) will make 50 percent payment of total cost including farmer’s share to SSC by releasing farmers’ demand draft and remaining from project funds, alongwith advice to install the system. In case 100% material is not shifted at site, the CAD Consultants will recommend 50% of the verified cost of material, provided that the verified material cost is not less than 80% of total material cost. After material verification, the concerned SSC shall complete installation of system at site;
- viii) On completion of installation, the SSC will report to concerned DDA (OFWM) and CAD Consultants for commissioning verification of installed system. The CAD Consultant will verify HEIS installation as per design while concerned farmer will provide his satisfaction. The consultants shall ensure that irrigation and fertigation schedules, log book and O&M manual in local language/Urdu have been provided to farmer; and, training regarding system operation and maintenance imparted to the farmer/ operator in coordination with concerned DDA (OFWM) by the SSC;
- ix) The SSCs will provide follow-up support service as per provisions of the agreements;
- x) DGA (WM)/ PD will pay remaining cost after retaining 10 percent of total system cost or Bank guarantee of equal amount, which will be released after two years on provision of

satisfactory follow up support services by the SSCs during two years, which will be verified by the concerned DDA (OFWM) and/ or the CAD Consultant or any other designated committee for the purpose;

- xi) All HEIS works will be executed under a tripartite agreement signed by Department, SSC, and the participating farmer; and
- xii) The SSC/ district/ tehsil OFWM staff will provide technical support to the farmers for the operation, maintenance, and troubleshooting of installed system as well as agronomic support regarding cropping geometry, fertigation, weed management, disease/pest control etc. under high efficiency irrigation environment.
- xiii) In case of any dispute, the matter will be referred to Dispute Resolution Committee consisting of Director Agriculture (OFWM), concerned DDA (OFWM) and representative of SSC whose decision will be final and would be binding on all stakeholders.

The flow chart of planned activities for installation of HEIS showing role of project implementing entities is presented in **Figure-7**.

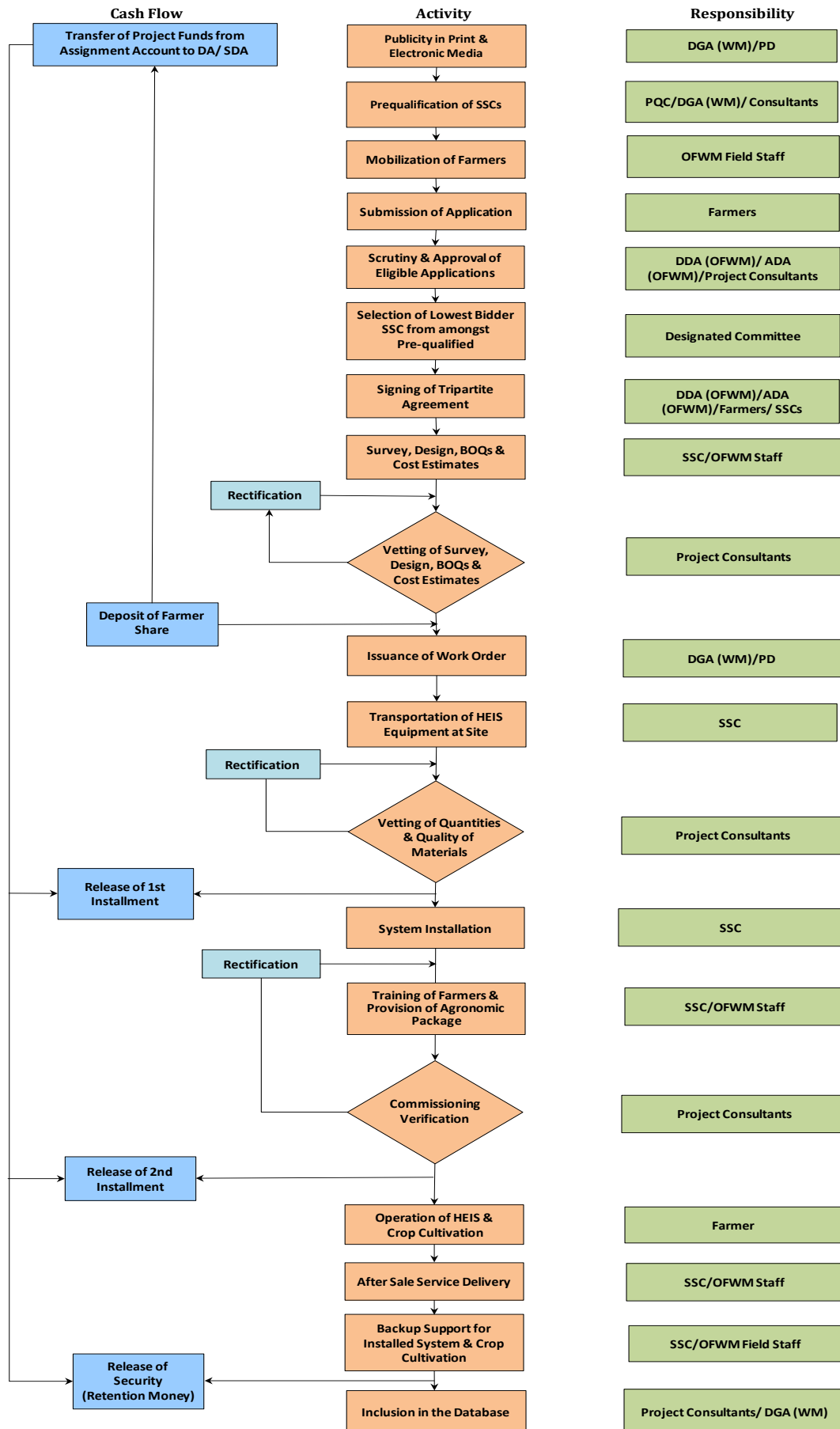


Figure-7: Implementation Process for Installation of HEISs

B-3 Construction of Water Storage Ponds and Solar Powered Pumping Stations for Irrigating Un-commanded Area in Outlet Command

This component will support construction of water storage ponds and solar powered pumping stations on about 20 sites for irrigating un-commanded area in outlet command on pilot basis. These sites will be decided based on site specific technical feasibility and financial viability. Solar powered pumping station of about one cusec would be installed. It is planned that the government assistance for this component would 80 percent of total system (water storage pond + solar powered pumping stations) cost while the remaining expenditures (20 percent) will be contributed by the participating farmers. It is estimated that cost for installation of such system would be about Rs. 3.5 million. The size of water storage pond is determined based on the weekly water demands of crops under HEIS at the peak period. Minimum requirement would be geo-membrane lining in the trapezoidal earthen water storage ponds. The size of such ponds mainly depends on the kind of crop grown and generally the estimated storage required for operating HEIS. It is planned that standard pond design approved by the CAD consultants would be considered for the purpose. All technical details would be finalized/ firmed-up during project execution and feasibility of each site.

C. Awareness Creation, Training, Capacity Development, Demonstration and Private Agriculture Support Services

This component will support awareness creation, communication, training and capacity building of stakeholders as well as demonstration of different activities for promotion of irrigated agriculture and high value crops.

C-1 Awareness Creation and Capacity Building of Stakeholders

The need for judicious and economical use of scarce water resources for sustainable irrigated agriculture is becoming increasingly important day by day. On Farm Water Management is promoting various water management technologies and techniques for improving water productivity at farm level. The well informed and knowledgeable farmers contribute significantly in enhancing productivity of all factors of production i.e. water, nutrients, energy, labor, capital etc.

The farmers in the project area are normally practicing rain-fed and traditional agriculture due to lack of irrigation facilities and knowledge about more profitable modern agricultural techniques and technologies. The development of irrigation infrastructure would bring a paradigm change in area. Accordingly, good working knowledge of the farmers would be required for crop production with the limited available water.

It is, accordingly, planned to launch an extensive awareness campaign and motivate farming community to actively participate in project activities for improving water as well as crop productivity vis-à-vis profitability. The farmers will be made aware of efficient irrigation methods, farm layout planning and improvement, water saving agronomic practices, soil moisture measuring/monitoring tools and techniques, cultivation of high value crops under drip and sprinkler irrigation etc. It is also planned to organize farmer days/ road shows for creating awareness amongst the farming community regarding project interventions and their benefits. Latest Information and Communication Technologies (ICT) would be used for awareness creation and media campaign.

Capacity building of farmers, professionals and sub-professionals is imperative for carrying out the envisaged project activities as well as creating awareness about the irrigated agriculture technologies/ techniques for their successful adoption. It is planned to formulate a comprehensive need based training program for all stakeholders including the farmers and water users association, who will be trained in operation and maintenance of newly constructed watercourses, O&M to HEIS, successful crop cultivation under HEIS, rainwater harvesting, successful cultivation of high value crops etc. The training of professionals and sub-professionals in different aspects of project implementation would significantly increase trained manpower and knowledge based human resource for promoting modern water management interventions to improve water productivity in the project area.

It is planned that that capacity building of about **3,000** farmers/ water users associations for operation and maintenance of watercourses and adoption of improved OFWM interventions. The additional recruited staff would also be trained regarding latest social mobilization and communication tools, successful project execution, environment management, monitoring and evaluation, risk management etc. The Water Management Training Institute (WMTI), Lahore will implement this component under supervision of DGA (WM)/ PD with technical assistance of CAD consultants. It is planned that annual plan regarding awareness creation and capacity building of stakeholders would be prepared, which will be got approved from the Implementation Committee of the CAD component.

C-2 Demonstrations of Modern Technologies and Techniques by Extension Wing

It is envisaged to demonstrate various modern climate smart irrigated agriculture development technologies and other extension techniques to the farmers to make efficient use of available water at the farm level as well as to translate water savings accrued from improvement

in on farm irrigation delivery and application efficiencies into increased agricultural production. The climate smart crop management technologies will be showcased at various crop demonstration sites (CDS) in the project area. The Extension wing of Agriculture Department would implement this component using latest crop cultivation techniques through modern extension methods by demonstrations as seeing is believing and farmer field school (FFS) i.e. learning by doing system.

- i) Rabi/Kharif crops (Seed, Fertilizer & Pesticide)
- ii) Water application techniques
- iii) Machinery promotion for irrigated agriculture on cost sharing basis

The Extension wing would prepare an annual plan regarding extension activities and get approved from the Implementation Committee of the CAD component. The detailed plan of the Extension wing is enclosed (**Annex-A**).

C-3 Private Agriculture Support Services (PASS)

In connection with the JIP, the NESPAK lead consortia has prepared an Agricultural Study Report and Guidelines and Plans for Developing Private Agriculture Support Services (PASSs). This study outlines existing agriculture practices in the Jalalpur canal command and proposes various solutions, especially to address the issues of marketing. This component will support farmers for marketing and supply chain management of high value agriculture. This component will support farmers in developing linkages between the growers and market as well as food processing/ exporters for marketing the produce. The back linkages from the buyers to the farmers for production of commodities according to desired quality would also be established to ensure smooth marketing. Similar linkages would also be developed between the farmers and private sector companies offering normal and cold storage facilities to ensure safe and economic disposal of farm produce. It will also support provision of equipment to the farmers/ service providers on cost sharing basis for processing and value addition of fruits, vegetables and other farm produce. This component may also support additional services like LASER land leveling required over and above the planned activities under components A and B.

A detailed document will be prepared by the DGA (WM) with the help of Marketing wing of the Agriculture Department, which will be got approved from the Implementation Committee. The implementing agency for this component will be decided by the Implementation Committee.

D. Command Area Development Consultancy and Project Management Support

This component will provide support for project implementation through Command Area Development (CAD) consultants and project management.

D-1 Command Area Development Consultants (CADC)

It is planned to recruit/ engage Command Area Development Consultants (CADCs) for command area development activities under JIP for implementation supervision and third party validation as well as monitoring & evaluation of project activities. The Consultant's main responsibilities would be design review/approval, construction supervision, quantity & quality assurance, technical assistance, monitoring & evaluation and overall coordination of project execution. The consultants' team will primarily reports to the Director General Agriculture (Water Management)/ Project Director but its major responsibilities would lie in the project area. The needed record and sites will be opened and made available to the consultants to enable them to perform their functions. The Consultant Selection Committee (CSC) will recruit the consultants in accordance with ADB guidelines for selection of consultants using the Quality and Cost Based Selection (QCBS) method. The detailed Terms of Reference (TORs) of the CADC including team of experts and man-month requirement is enclosed as **Annex-B**.

D-2 Monitoring and Evaluation

Internal monitoring of project activities at provincial level would be carried out by the Directorate General Agriculture (Water Management) Punjab/ Project Implementation Unit (PIU) through its technical staff while Divisional Directors Agriculture (OFWM), Rawalpindi and Sargodha would be responsible to monitor the activities in respective division. The Deputy Director Agriculture (OFWM) Jhelum and Khushab would also carry out internal monitoring at the district level.

For external monitoring of project activities, the Monitoring & Evaluation (M&E) team of CAD Consultants will carry out monitoring and evaluation of project impacts to ensure achievement of the project development objectives. The CAD consultants' M&E team would develop formats and log frames to track achievements against the plan.

D-3 Project Management

It is planned that execution of command area development works will primarily be implemented with existing infrastructure and human resource base of OFWM with some incremental staff. Director General Agriculture (Water Management) Punjab would act as the Project Director (PD) and would coordinate, supervise, manage and monitor the proposed project from provincial headquarters mainly through existing establishment. The proposed command area development activities will be executed through well established and time tested farmers' institution of Water Users Association (WUA)/ participating farmers under the technical

supervision of district level OFWM staff and project supervisory consultants. The WUAs would function in accordance with the provisions of “OFWM and WUAs Act 1981”.

The DGA (WM)/ PD of command area component of JIP having a supervisory role, will ensure linkages with the nodal organization/ Project Director (JIP) and different project executing committees. DGA (WM)/ PD will be the member of the Project Steering Committee of JIP. It is proposed that an Implementation Committee (IP) for command area development component of JIP would be constituted comprising of the followings officers.

1. Secretary, Government of the Punjab, Agriculture Department	Chairman
2. Project Director, JIP	Member
3. Representative of Finance Department	Member
4. Chief (Agriculture), P&DD/ Representative of P&DD	Member
5. Director General Agriculture (Extension & AR)	Member
6. Director General Agriculture (WM) Punjab/ PD	Member/ Secretary

The Implementation Committee (IP) would meet quarterly or as and when required to review the physical and financial progress as well as to suggest means to overcome the constraints/bottlenecks faced in the field for execution of project activities. The major functions of IP would be as follows.

- i. Approve annual physical and financial work plans
- ii. Monitor physical and financial progress and streamline flow of funds
- iii. Approve/ amend/ change the criteria's for selection of beneficiaries under various project components, if required
- iv. Identify the constraints in achieving targets and devise strategies for their redressal
- v. Review monitoring reports and take appropriate actions
- vi. Constitute committee(s) to review/ approval of equipment standards & specifications, prequalification of supply & services companies, resolve specific issues relating to civil works, hiring of project staff, rates of construction materials and for any other technical matter
- vii. Ensure implementation of decisions of Project Steering Committee
- viii. Make necessary modifications/ improvements in project implementation modalities including cost sharing, unit costs, flow of funds, recruitment criteria for project staff, inter-component physical & financial adjustments etc. for smooth execution of project interventions

III) MATERIALS, SUPPLIES AND EQUIPMENT REQUIREMENT

It is planned to utilize the existing materials, supplies and equipment for implementation of the scheme. However, additional requirement of transport, office equipment, survey equipment will be met through procurement under proposed project (**Annex-C**). Lump-sum amount of about Rs. 25 million has been kept for construction of office buildings in Jhelum and Khushab.

7) CAPITAL COST ESTIMATES

a) Indicate date of estimation of project cost estimates

The cost estimates of the project have been prepared as per prevailing market rates of July 2017.

b) Basis of determining the capital cost (market survey, schedule rates, estimation on the basis of previous work done etc.)

Capital cost of the project is based on the prevailing average market rates of various items available in the open market during July 2017 in the Punjab. The unit cost for watercourse development/ construction and installation of HEIS and other project interventions is attached (**Annex-D**).

c) Year-wise/Component-wise Phasing of Physical Activities

The year-wise/component-wise phasing of physical targets/activities of the project is appended (**Annex-E**). It is indicated that the year-wise phasing of physical targets vis-à-vis financial implications are indicative, which may be reviewed/ changed by the competent authority/ Implementation Committee (IP) of CAD component or Project Steering Committee based on availability of the resources and demand.

d) Year-wise/Component-wise Financial Requirements

The year-wise/component-wise phasing of financial requirements for project activities is provided (**Annex-F**). The yearly estimates of operational expenses at the provincial and district level are also attached (**Annex-G**). The object-wise details of project costs is given at **Annex-H**.

e) Foreign Currency Exchange Rate for Estimation of Revised and Original Project Cost

N/A

8) ANNUAL OPERATING AND MAINTENANCE COST AFTER COMPLETION OF PROJECT

It is indicated that the proposed technologies/ interventions have long life ranging from 10-20 years and farmers would need technical support even after project completion. The OFWM staff would provide technical support services to the farmers for sustainability of the envisaged works after project completion/ expiry of warranty period by the SSCs in case of HEIS, Solar etc. It is estimated that about Rs. 15 million per annum would be required after project completion to provide support services to the farmers for sustainable operation & maintenance of the completed works as well as maintenance/ operation of infrastructure/ buildings developed under the project.

9) DEMAND AND SUPPLY ANALYSIS

Water scarcity and inefficient use of available water resources has long been considered one of the major constraints in attaining potential production from otherwise highly productive agricultural lands of the Punjab. As such, the proposed project would result in developing the culturable waste land for agriculture in Jalapur Canal command and promoting irrigated agriculture with efficient utilization of limited water resources being made available from new canal system through sustainable infrastructure development at the farm level to alleviate poverty in the project area by generating enhanced employment opportunities and maximizing farm profitability. As such, there is huge demand for irrigated agriculture development in the area through ensuring irrigation water in the area.

10) FINANCIAL PLAN (FINANCING SOURCES)

a) **Equity**

NA

b) **Debt**

NA

c) **Grants alongwith Sources**

(Rs. in million)

Sources	Amount for Capital Cost	Amount for Recurring Cost
Foreign Assistance		
Loan	2,624.052	-
Grant	-	-
Technical Assistance	-	-
Federal Government	-	-
Grant	-	-
Loan	-	-
Investment	-	-
Direct Expenditure	-	-
Provincial Government	793.360	-
Grant	-	-
Loan	-	-
Investment	-	-
Direct Expenditure	-	-
Sponsoring Agency's own fund	-	-
Private Investment (SSCs)	-	-
Local Body Resources, if any	-	-
Non-Government borrowing	-	-
Beneficiaries Contribution	542.290	-
Other sources (e.g. Recoveries)	-	-

d) **Weighted Cost of Capital**

NA.

e) **Flow of Funds**

A foreign currency Assignment Account in the name of DGA (WM)/Project Director would be opened and maintained for channeling the Asian Development Bank (ADB) funds after fulfilling prescribed codal formalities. The funds from ADB will be transferred directly into the specified account. The allocations approved by competent authority for pay & allowances, operational expenses, training, watercourse improvement activities etc. would be transferred from Assignment Account on proportionate basis to Account No.1 of provincial government for onward transfer to DDO Codes/ Cost Centers of concerned DDA (OFWM) through Finance Department. The funds required for consultancy services, payments to SSCs and service providers on account of LASER land leveling, installation of HEIS, infrastructure development, procurement of goods, vehicles & equipment, project allowance etc. will be retained at provincial level for disbursement/ payments by the DGA (WM)/Project Director. The schematic diagram illustrating flow of funds is given in **Figure-8**.



Figure-8: Funds Flow Mechanism

11) PROJECT BENEFIT AND ANALYSIS

a) Financial Benefits

The project will have both tangible and intangible benefits but there will be no direct

income from the scheme to the government from the command area development activities. Increase in crop yields, cropping intensity, cropped area, better change in cropping pattern, good quality produce etc. resulting from implementation of envisaged interventions will, however, trigger income activities and have an indirect impact on its income side. The same would result in substantial increase in farm profitability and provide enhanced employment opportunities to the rural population of project area.

b) Economic Benefits

The project would have a transformational impact on irrigated agriculture in the Jhelum and Khushab districts and surrounding areas. All proposed interventions under the project for command area development are economically viable with very high Internal Rate of Returns (IRR).

c) Social Benefits

Irrigation water being made available through development of farm level water infrastructure and its subsequent use through improved irrigation application (drip/sprinkler, LASER land leveling) would increase the cropped area, crop yields, cropping intensity and farm profitability in the project area. Accordingly, increased income level of the farming community will improve their livelihood and generate more economic activities.

d) Environmental Benefits/Impact Assessment

Various project impact evaluation studies were carried out to assess the effects of different OFWM interventions such as watercourse improvements, LASER land leveling, and drip irrigation system. These studies clearly indicate that the improvements in water conveyance and application have positive affects in controlling waterlogging and rising watertable, improving water management, reducing the drainable surplus, and reducing soil salinity risks. The project interventions would not bring adverse environmental affects normally associated with new developments, such as resettlement, depletion of land and water resources, and loss of wildlife habitat.

e) Employment Generation

Implementation of CAD activities would provide enhanced employment opportunities, particularly to the rural population of project area. About 400,000 man-days of skilled and unskilled labour would be generated through watercourse development and construction activities. More than 50 LASER service providers would be engaged for LASER land leveling of about 30,000 acres of land in the project area. Moreover, about 200 persons will be engaged as operators

and helpers in operation of high efficiency irrigation systems. Improvement in crop yields will also boost economic activity in rural areas of the province that will create further employment options. It is estimated that an amount of about Rs. 542.290 million would be contributed by farmers as cost sharing under the project. It is, therefore, concluded that project implementation will stimulate employment generation not only for skilled and unskilled labor in the villages but will help in opening of new earning opportunities in the rural sector.

f) Economic Analysis/ Financial Analysis

All proposed interventions for command area development are well tested community interventions and socially acceptable, technically feasible and economically viable. The World Bank funded PIPIP has found out Economic Internal Rate of Returns of these interventions as given below.

Watercourse Improvement	=	42.6%
HEIS	=	35.1%
LASER Land Leveling	=	29.6%

g) Impact of Delays on Project Cost/Viability

In view of no major incremental water resources development in near future, only source of increased water availability at the farm level is through such micro interventions for irrigated agriculture development. Any delay in implementation of proposed interventions may result in irreversible losses besides increase in project costs due to price escalation of materials.

12) IMPLEMENTATION SCHEDULE

The starting and completion dates of the project are given below.

Starting Date	Completion Date
July 2019	30 June 2023

13) HUMAN RESOURCE MANAGEMENT PLAN/ MANAGEMENT STRUCTURE

a) Existing Facilities

On Farm Water Management (OFWM) program in the Punjab is part of the Provincial Agriculture Department headed by Secretary Agriculture. The program is planned, coordinated, supervised, and operated by Director General Agriculture (Water Management) at provincial level who is assisted by the Director (Headquarters) and Director (Training). On promulgation of Devolution Plan 2001, the OFWM functions were devolved to District Governments at the district level.

On promulgation of new Punjab Local Government Act 2013, the administrative hierarchy has again been shifted at provincial level whereby offices of nine (9) Divisional Directors Agriculture (OFWM) have been established to supervise the OFWM activities. The posts of District Officer (OFWM) at District Level and Deputy District Officer (OFWM) at tehsil level have been re-designated as Deputy Director Agriculture (OFWM) and Assistant Director Agriculture (OFWM), respectively. Tehsil is the lowest tier of OFWM administrative system for physical execution of works through field staff comprising of one Water Management Officer, two Water Management Supervisors, and other support staff. Currently, offices of ADA (OFWM) have been established in 126 tehsils.

b) Project Implementation and Coordination Arrangements

The proposed project will be implemented with existing infrastructure and human resource base of OFWM wing of Agriculture Department. Some incremental staff would, however, be required at provincial and district/ tehsil level to carry out the envisaged activities. The major project activities will be implemented through well established and time tested farmers' institution of water users association (WUA).

c) Provincial Supervision, Management, and Monitoring

Director General Agriculture (Water Management), Punjab would act as Project Director who will be responsible to supervise, manage, and monitor the proposed project from provincial headquarters through its existing establishment. Project Implementation Unit (PIU) would be established at Directorate General Agriculture (Water Management), Lahore to support the PD for smooth implementation and monitoring of planned activities.

d) Divisional Directorate Agriculture (OFWM)

Divisional Director Agriculture (OFWM), Rawalpindi and Sargodha will supervise project activities at divisional level and provide necessary technical support to the district offices as well as coordinate between provincial headquarters and field formations.

e) District and Tehsil Offices

Deputy Director Agriculture (OFWM) Jhelum and Khushab would be responsible for supervision, coordination and internal monitoring at the district level. The field activities under proposed project will be executed by the Assistant Director Agriculture (OFWM) concerned. Offices of Deputy Director Agriculture & Assistant Director Agriculture (OFWM) Khushab and Deputy Director Agriculture (OFWM) Jhelum with Assistant Director Agriculture (OFWM), Pind

Dadan Khan tehsil would be the functional tier of OFWM organizational setup for implementation of proposed works. Some incremental staff will be required to strength the capacity for effectively carrying out the functions specific to this initiative. These would include one Deputy Director Agriculture (OFWM)/ Liaison Officer (BS-18+SP) in the nodal organization or in the office of Project Director, JIP, one Procurement Specialist, one Contract Management Specialist, two Assistant Director (Technical) (BS-18), four (4) Water Management Officers (BS-17), one Accountant (BS-16), three (3) Computer Operator (BS-11), 25 Water Management Supervisors (BS-11) and 29 Rodmen with some other support staff as shown below in **Table-1**. The recruitment of proposed staff will be carried out as per eligibility criteria given at **Annex-I**.

Table-1: List of Proposed Staff

Sr. No.	Name of Post with BS	No. of Position	Proposed Posting Station
1	Deputy Director Agriculture (OFWM)/ Liaison Officer (BS-18+SP)	1	DGA (WM)/ PD Office/PIU
2	Procurement Specialist (Lumpsum Pay Package)	1	DGA (WM)/ PD Office/PIU
3	Contract Management Specialist (Lumpsum Pay Package)	1	DGA (WM)/ PD Office/PIU
4	Assistant Director (Technical) (BS-18)	2	DGA (WM)/ PD Office/PIU
5	Water Management Officers (BS-17)	4	DDA (OFWM)/ ADA (OFWM) Office
6	Accountant (BS-16)	1	DGA (WM)/ PD Office/PIU
7	Computer Operator (BS-11)	3	DGA (WM)/ PD Office/PIU
8	Water Management Supervisor (BS-11)	25	ADA (OFWM) Office
9	Vehicle Driver (BS-4)	1	DGA (WM)/ PD Office/PIU
10	Naib Qasid (BS-1)	3	DGA (WM)/ PD Office/PIU/ ADA (OFWM) Office
11	Rodman (BS-1)	29	ADA (OFWM) Office
	Total	71	

The institutional arrangements envisaged for implementation of activities is shown in the diagram enclosed at **Annex-J**.

f) Procurement Plan

The procurement under this project will be carried out in accordance with the Asian Development Bank guidelines and relevant rules of Government of the Punjab. Key procurement responsibility rests with the office of DGA (WM)/ Project Directorate/ PIU, which has procurement capacity and has gained sufficient experience during the implementation of other

projects. Procurement plan will be prepared at the start of financial year, which will be updated on the website. The procurement plan, notices for inviting consulting services, bid documents for procurement of goods, RFPs for consultancy services, summary of bid/proposal evaluation reports, contract award data etc. will be posted on the website.

g) Risk Mitigation Plan

Overall, there is no risk in the project implementation as the project interventions are time tested and being implemented in the province since 1976. There exists sufficient potential and capacity for implementing envisaged interventions. The timely availability of project funds vis-à-vis its transfer to the district as well as timely completion of canal infrastructure by Irrigation Department and provision of requisite information about *Chak-bandi* plan, outlets and watercourse right of way would be helpful in smooth execution of project activities. All proposed project interventions have been rated low risk.

14) ADDITIONAL PROJECTS/ DECISIONS REQUIRED

No additional project/ decision is required.

15) CERTIFICATE

Certified that the project proposal has been prepared in the light of instructions provided by the Planning Commission for the preparation of PC-I for production sector projects.

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Extension Component of CAD-JIP

1. Project Objectives

The main objective of the project is to make best efficient agricultural use of command area of Jalapur Canal passing through area of Jehlum and Khushab districts. It will play vital role in enhancement of area and productivity of field crops, fruits and vegetables and ensure the supply of these items high value crops i.e. field crops, fruits and vegetables to encompass the supply of these items round the year on sustainable and affordable prices. It will also improve the cropping intensity, reduce land degradation and bring 160,000 acres under canal command and improving productivity. Besides it, it will also prove game changer in increasing income of farming community, ensuring food security and positive impact on socio economic condition of the people of the area.

2. Overall Objectives of the Project

- To enhance the Productivity of different field crops, fruits, and vegetables in the specific potential project area on sustainable basis by promoting new technologies and interventions
- To promote innovative technologies of targeted crops by
 - a. Conducting demonstration plots on new varieties, technologies and interventions of targeted crops.
 - b. Holding of farmer days on demonstration sites for showcasing the results of demonstration to farmers as seeing is believing
 - c. Educating the farmers through Farmer Field Schools for promotion of specific crops in their potential areas.
- Improvement in the farming skills for adaption of new technologies through FFS.
- To increase area of fruit orchards by provision of true to type healthy fruit plants.
- To improve the economic condition of the rural masses by increasing per acre yield
- To improve the health of human being by provision of quality and nutritious food items at affordable prices.

The objectives of the sector/sub sector as indicated in the medium term/five year plan are reproduced. Indicate objectives of the project and linkage between the proposed project and the sector.

Agriculture sector is a vital component of Pakistan's economy as it provides the raw materials to down the line industries and helps in poverty alleviation. This sector contributed 19.8 percent in GDP and it remains so far the largest employer absorbing 42.3 percent of the country's total labour force with 63% share in export earnings. Punjab contributes 70% to the overall national agricultural output with share of wheat, cotton, rice, sugarcane, maize, mango, citrus, guava, potato, pulses and oil seeds @ 96%, 71%, 56%,65%.78%,66%,95%,82%,95%,79%,and 82% respectively. Overall objective of Agriculture sector is to increase productivity on most

economical terms. To keep ourselves competitive in international market equal weightage is required in quality improvement, provision of nutritious food, reduction in malnutrition and improvement in health of the public under WTO regime. All above aspects have been fully envisaged in the proposed project for enhancing production of food items and cereals in Punjab.

The project objectives are in line with sector/sub sector as indicated in the medium term/five year plan and the existing vision of the present Government and Agriculture Policy of the Punjab province regarding food security with ultimate goal i.e. availability of all essential items especially fruits ,vegetables & grains round the year on affordable prices.

3. Description and Justification of the Project

Pakistan's current population accounts 190.2 million with an annual growth rate of 1.55 percent. It shall rise to nearly 230 million by 2020, about 260 million by 2030 and expected to double by 2050 making Pakistan 4th most populated state of the world from its increment states of 6th most populated country. On the other hand, the total cultivated area has increased only by 0.40% during past 6 decades. The current rate of urbanization is also expected to increase rapidly as there will be 50:50 rural-urban population rates by 2050, indicating tremendous pressure on land and a need of urgent efforts to narrow down food demand supply gaps.

The population increase combined together with changed living standards will require 40-50% additional food by 2025. This additional food can be achieved through increased crop yield and expanded irrigated area, wherever opportunities exist. Punjab contributes to about 80% of the Pakistan's food requirements and \$60 billion to the National Gross Domestic Product (GDP). Irrigated agriculture accounts for 28% of Punjab's GDP and employs over 50% of its labour force. Punjab manages an existing irrigation system serving 8.4 million hectare irrigated land. Replacement cost of Punjab's irrigation infrastructure is about \$18 billion. The Country Partnership Strategy (CPS) (2009-13) prioritizes improving the irrigation infrastructure. ADB agriculture sector evaluation (2006) for Pakistan emphasizes improving water resources and irrigation.

The proposed Jalalpur Irrigation Project (JIP) is located along right bank of River Jhelum in Punjab, Pakistan. The proposed Jalalpur Canal project is located almost 200 km to the North West of Lahore, the Capital of Punjab province. The project area comprises of 110 km long and narrow strip of land to the right bank of the Jhelum River. It starts from Rasul Barrage and ends near Ludan wali village about 20 km North of Khushab town and covers a large part of Pind Daden Khan Tehsil of District Jhelum and some part of Khushab District. It is bounded on the south side by the River Jhelum and on the North side by the range of hillocks.

It will create new non-perennial irrigation services for enhanced agricultural production on 79,750 ha (160,000 acres) in Pind Daden Khan and Khushab districts. The project will increase kharif crop intensity by 50%, improve crop yield and reduce land degradation. It will directly benefit over 200,000 rural people; mostly poor. The project will (i) construct over 200 km new irrigation canals, (ii) introduce institutional reforms and establish farmers organizations (FOs), and (iii) build farmers capacity. The project is included in country operations business plan (COBP: 2013-14) and it will contribute to food security and economic growth and will alleviate rural poverty in the project area. The project impact will be the increased agricultural production in the project area (Pind Daden Khan and Khushab districts). The objectives of this water sector project

are the development of land and water resources in order to increase the agriculture production leading to self-sufficiency in food and fiber. An area of about 160,000 acres (CCA) shall receive benefits from the project. The project outcome will be irrigation water supplies and agricultural support services available in the project area.

The project after completion shall provide regular and ensured irrigation supplies to the new areas as well as rain fed and well/Tube well irrigated areas, increase in cropping intensity and agriculture productivity for enhancing food security. It will have healthy effect on socio-economic condition of the people of the area and provide base for industrial development upon Agriculture produce. It will also reclaim the salt affected area, which is lying barren in Pind Daden Khan Tehsil of District Jhelum and Khushab Tehsil. The project will also provide cross drainage works on the canal and smooth passage of flow of hill torrents which would fall in River Jhelum.

I. Interventions:

The following strategy and interventions related to crop production are proposed for development of new command area under the project.

- Creating awareness amongst the farming community for efficient irrigated agriculture.
- Promotion / adoption of suitable cropping patterns.
- Provision of technical and financial support to the farmers for adoption of modern technologies.
- Capacity building of growers in successful irrigated agriculture and cultivation of high value crops including vegetables and orchards.

These interventions shall be performed through demonstrations as seeing is believing and farmer field school (FFS) i.e. learning by doing system.

II. Laying out Demonstration Plots of Field Crops, fruits and vegetables:

a) Field Crops:-

In the project area both for Rabi and Kharif crops, 100 demonstration plots @ one acre per plot will be laid out each year.

b) Fruits & Vegetables :-

To propagate latest production technology on fruits and vegetables to farmers it has been proposed that under the project 36 number of D-plots of fruits orchards consisting of one acre each every year and 36 number of D-plots of vegetables consisting of one acre each every year will be established in both project tehsils Khushab in the district Khushab and Pind Dadan Khan in the district Jhelum.

III. Laying out Demonstration Plots of Agronomic Crops

Demonstration is very important tool to promote any intervention in the field because the farming community believes on the fact “*SEEING IS BELIEVING*” this idea will be implemented in true sense for the farming community for its adoption at large scale. The innovative technologies on Rabi and Kharif field crops will be promoted to improve the productivity and quality of selected crops through demonstration plots. In this regard the demonstration on certified

seed of promising varieties/hybrids with high yield potential and resistant to biotic and abiotic stresses will be made on one acre in each selected location. The seed, fertilizer and pesticides along with laying out cost will be born by the project and all other farm practices like seed bed preparation, harvesting etc. will be managed by the selected farmers himself as per recommendations of the agriculture department. Results of demonstration will be displayed/showcased to the farming community at large. Farmer selected for demonstration after following transparent procedure will give written undertaking that he will abide by the conditions imposed on him to manage the demonstration plot in a befitting manner failing which the cost of inputs spent on his plot will be recovered from him as arrears of land revenue after complete probe. The detail year wise physical and financial requirements for the activity of demonstration plots to be laid out by agriculture extension service has been indicated in the cost table.

a) Criteria For Selection Of Site and Farmer For D/Plot

- The site to be selected shall be demonstrative and can be easily accessible to visiting farmers
- The front of the Demonstration Plot shall be on the road and ADA (Ext) will ensure proper Demonstration at the site.
- Installation of iron sign board containing all information including interventions carried out on D/plot will be ensured by the respective ADA (Ext.) for information of visiting farmers.
- Demonstration of the selected crops will be laid out on one acre each.
- The small farmers having land from 5 to 12.5 acres will be selected for laying out of Demonstration Plot, however, Hub farmer having above qualification will be preferred
- Educated, intuitive, cooperative and ready to take the departmental recommendations.

b) Committee for Selection of Farmer for D-Plots

A committee at District level will be notified under the chairmanship of Deputy Director Agriculture:-

1.	Deputy Director Agriculture (Ext.)	(Chairman)
2.	SSMS/RO (FT & AR) nominated by respective DA (FT & AR)	(Member)
3.	Assistant Director Agriculture (WM) of respective tehsil	Member
4.	Assistant Directors Agri. (Ext) of respective tehsil	(Member/Secretary)

Five growers for each D-Plot meeting the criteria for D-Plots as mentioned above will be selected by Agri. Officer and verified by ADA (Ext.) & ADA (WM) of respective Tehsil about the status of identified farmer. Identified farmers will be given prescribed forms to apply for the demonstration plots to the district committee. Distribution of plots will be made after balloting amongst the applicants for each crop. This committee will also serve as grievance redressal

committee to address the issues of the farmers with respect to identification, provision of agreed inputs and quality.

IV. Holding of farmer's days and use of other extension tools (Farmer Training, Seminars, literatures) to lure farmers on adoption latest technology

Seminars at district level will be arranged to create awareness about best management practices/production technology for selected crops during Rabi and Kharif season. The latest technology needs to be disseminated to the farmers by various methods including on farm visits, demonstrations, training of farmers and farmer days. Every year 25 number of farmer days on D-plots will be held.

Funds have been proposed to arrange gatherings for maximum awareness to the farmers and to create a ripple effect through mega gatherings with the participation of notables of the society and progressive farmers at demonstration site. At maturity of the crop, a farmer day will be conducted on demonstration plot site to offer the participants to witness the difference between an ordinary crop and demonstration unit. On an average one farmer day will be conducted, at one of three demonstration plots, on selected crops for showcasing the results of the technology as seeing is believing. The detail of crop wise physical and financial requirements for the activity of Farmer Days/Seminars to be conducted by agriculture extension service are indicated in cost table.

V. Capacity building/training of farmers through Farmers Fields School

Farmer Field School is an unusual site. School without walls where farmers and facilitators gather on weekly/fortnightly basis to analyze the progress of a crop, learn the biotech interactions between soil, plants & insects, chart the dynamics of insect population and finally bring this knowledge together to make informed crop management decision. Every year 100 number of Farmer Field School (FFS) will be held.

Components of FFS

Farmer Field School System (FFS) comprises of following four components:

Master Trainer

Master Trainer is a key trainer who trains the facilitators. He plays a complex role as an experienced facilitator, organizer, coordinator and evaluator.

Facilitator

FFS facilitator is more than a teacher or an instructor. He plays a complex role of an experienced farmer, a questioner, a confidante, an organizer, and a coordinator.

Member Farmer

Farmers with piece of land under cultivation, willing to participate in FFS activities throughout the crop season and have the decision powers to implement the farm operations. During current year, 25 farmers per FFS will be selected in each village, keeping in view their practical engagement in self cultivation with level of interest.

Demonstration Plot

A field with a specific crop which act as primary learning material for the training of farmers/facilitators, from where they collect, analyze and compare field data. It also acts as a class room for FFS.

Seminars/Workshops

It is fact that one seminar may give more knowledge to its listeners than a targeted grand campaign; therefore, seminar/ workshops will be arranged once in a crop season at the district level to disseminate the exact production technology and good agricultural practices amongst all stakeholders. In these seminars for the awareness of general public special emphasis will also be given on post-harvest loses, and value addition. The experts will be invited in these seminars/workshops to provide exact and do able technology. Funds have been proposed to arrange seminars/workshops once in a crop season for maximum awareness and to create a ripple effect with the participation of notables of the society. The detail of seminars/workshops is given in the cost estimates table.

VI. Printing of literature for awareness of the field staff and farmers

Effective dissemination of latest technology among the end users-farmers involves the use of various channels including mass media for the transmission of messages to large audiences. Mass media can be classified as print media and electronic media. Print media include words, pictures and diagram to convey precise and clear information on a mass scale. Farmers can use printed material for long period as permanent reminder and can use again and again. The print media gain popularity and attract the attention of the end users when they address the real problems faced by the farmers and provide feasible solutions to them. Extension worker can use printed material along with other communication channels to reinforce the learning process of farmers. So the print media seem very important, as more than half of the population is literate.

The capacity building of the technical staff and farmers on latest production technology on different selected crops, fruits and vegetables will be made through provision of literature in the form of training manual and booklets/pamphlets. The training manual will be prepared for backstopping the experts and field staff of agriculture extension through provision of printed material containing detailed technology in book for on glazed paper with four color as permanent reference book form field staff. Literature in form of booklet/leaflet for famers containing detailed production technology along with pictorial description covering all operations and processes including symptoms of nutritional deficiency, identification of insect pest and disease with their control measures, in a preserved form on quality paper with four color printing will be prepared and distributed among farmers during farmers training programs and farmer days. The detail of physical and financial requirements for the activity of printing of literatures by agriculture extension service is indicated in cost estimate table.

VII. Publicity through print & electronic media and other extension tools

In the modern era, the use of print & electronic media is very important tool to promote any proven results and demonstrations for the benefit of the society. Therefore, these tools will be used to promote use of certified seed of promising varieties/hybrids with high yield potential and resistant to biotic and abiotic stresses in selected crops in Punjab. Special programs will be

produced and telecasted/broadcasted on televisions and radio through Directorate of Agriculture Information for Sustainable Development and Productivity Enhancement of different crops, Fruits and Vegetables by promotion of latest technologies and interventions.

Directorate General Agriculture Extension will provide approved technology package and place indent to Director Agriculture Information for printing of the messages and telecast through PTV or any other channel. In this way the farmers will be motivated to adopt latest technology and interventions for productivity enhancement and nutritional improvement in different selected crops resulting in economic wellbeing food security and targeting malnutrition.

VIII. Project Strategy

a) Project Implementation

Director General Agriculture (Ext. & AR) Punjab Lahore will be operational in-charge of the extension activities both for administrative and financial matters through Divisional Directors of Agriculture (Ext.) Sargodha and Rawalpindi, through their field formation.

b) Financial Management

- The Project funds required to be spent will be provided to the concerned Directors of Agriculture Extension/Deputy Directors Agriculture Extension as per requirements. DA/DDAs (Extension) will exercise their financial powers as per Financial Rules, 2006.
- Funds required to be spent by Directorate General Agri. (Ext. AR) Punjab, will be placed at his disposal and will be debit able to Provincial Account-I.

c) Targets of the Project

Challenging targets for enhancement of nutritious food items through provision of recommended inputs and adoption of Good Agriculture Practices (GAP) leading to productivity enhancement have been proposed in the project and all out efforts will be made to achieve the same. However, keeping in view the availability of water resources in the command area and weather,

IX. Project Benefits

a) Social benefits with indicators

- Production of field crops , fruits and vegetable will increase
- The farmers' net income would increase along with enhanced employment opportunities for rural masses.
- Skill and awareness of farming community would improve.
- The use of processed/preserved vegetables would be enhanced.
- Business opportunities in the rural areas would increase.

b) Employment generation (direct and indirect)

As a consequence of expansion in labour intensive enterprise and value addition activities, new employment opportunities would be created for rural masses.

c) Environmental impact

The project activities are in line with natural resource conservation. Enhanced fruit, vegetable, wheat and plantation will improve the environment and decrease environmental pollution. The project is environmental friendly and also reduces post- harvest losses.

d) Quantifiable output of the project

With the implementation of project, the production of fruit, vegetable, and field crops in the project area will be enhanced qualitatively and quantitatively for domestic use and better health condition. As project has a lot of interventions, most of them are labor intensive so reasonable employment will also be available in the rural masses. With the laying out demonstration plots, farmer days, training of the farming community the awareness level of different cultural practices and their adoption will be increased and as a outcome the post-harvest losses will also be reduced, so following will be the quantifiable outcomes of the project:-

- The awareness level of farming community regarding different practices will be enhanced up to 70%.
- The production of quality fruit, vegetables, and field will be increased at 5%.
- As most of the interventions are to be carried out in the rural areas and labor intensive, so the employment will be available in the project areas.
- The adoption level of farming community regarding modern production practices of fruits, vegetable, and field crops will be enhanced more than 70% at present level.
- The post-harvest losses would be reduced up to 7-10%.

e) Risk Mitigations Strategy

Risk	Rating	Mitigation Strategy
Delay in release of funds	Depend upon time of delay	Time release of total allocation of funds at one time.
Delay in supply of inputs for demo of targeted crops	Depend upon time of delay	Timely supply of desired inputs by the implementing agencies.
Natural Climate change	Depend upon intensity of climate change	By blessing of Almighty Allah the climate will favor the sowing and growth of the targeted crops

f) Human Resource Management Plan

Skilled and qualified manpower is available at district and tehsil and markaz level for implementation of the project activities. Local technical manpower and required material is available to meet the requirements of the project implementing agencies.

Command Area Development of Jalapur Canal Project (CAD-JIP)

YEAR-WISE/ COMPONENT-WISE PHYSICAL ACTIVITIES AND FINANCIAL IMPLICATIONS OF EXTENSION COMPONENT

JALALPUR CANAL COMMAND AREA DEVELOPMENT PROJECT (AGRI. EXT. COMPONENT)													
Sl. No	Object Code	Activity Functional Classification	U.Cost (Rs.)	1st Year		2nd Year		3rd Year		4th Year		Total	
				No.	Cost	No.	Cost	No.	Cost	No.	Cost	No.	Cost
				(Rs. Million)									
A. PC 22036-Development (Revenue)													
1	AO 3907	Demonstration Plots of Field Crops (Seed + Fertilizer + Pesticides + Cost of sign board i.e.Rs. 5000/- & laying out Charges i.e. Rs. 5000/-) 50 plots per tehsil, 25 per Rabi & 25 per Kharif season , Total plots for 2 tehsils = 100, (15% inflationary cost every year over 1st year)	35,000	100	3.50	100	4.025	100	4.63	100	5.32	400	17.48
2		Establishment of Orchard (Citrus, Guava & Olive) Cost of plants, fertilizer, Pesticides + Cost of sign board i.e.Rs. 5000/- & laying out Charges i.e. Rs. 10000/-) 18 plots of orchard one acre each per tehsil, Total plots for tehsils = 36 (15% inflationary cost every year over 1st year)	85,000	36	3.06	36	3.519	36	4.05	36	4.65	144	15.28
3		Demonstration Plots of Vegetables (Seed/ Nursery + Fertilizer + Pesticides + Cost of sign board i.e.Rs. 5000/- & laying out Charges i.e. Rs. 7000/-) 18 plots per tehsil, 9 per Rabi & 9 per Kharif season , Total plots for 2 tehsils = 36, (15% inflationary cost every year over 1st year)	52,000	36	1.87	36	2.153	36	2.48	36	2.85	144	9.35
4		Farmer Days at Demonstration plots of Field Crops, Orchards and Vegetables @ of One Farmer day per six D/plots (15% inflationary cost every year over 1st year)	50,000	25	1.25	25	1.438	25	1.65	25	1.90	100	6.24
5		Farmer Field School(FFS) Rs.10000/- for stationary and material per FFS and Rs. 1000 for entertainment per FFS per working fortnight (16) on an average during the year	26,000	100	2.60	100	2.99	100	3.44	100	3.95	400	12.98
6		Rabi Drill , provision to farmers on 50% cost sharing basis through balloting, 15 Rabi Drills per tehsil	45,000	30	1.35	30	1.553	30	1.79	30	2.05	120	6.74
7		Hand Sprayer on 50% cost sharing basis, 150 per tehsil and 300 for 2 tehsils per year	4,000	300	1.20	300	1.38	300	1.59	300	1.83	1200	5.99
8		Printing of literature Training Manual & Production Technology on field crops, fruits and vegetables (Rs. 0.500 Million per year)	-	-	0.50	-	0.5	-	0.50	-	0.50	-	2.00
9		Advertisement and Publicity through print and electronic media	-	-	1.00	-	1.00	-	1.00	-	1.00	-	4.00
10		Purchase of Vehicle , single cabin pick up (2200 to 2500 cc with customisation)	2,600,000	2	5.20	-	-	-	-	-	-	2	5.20
11	AO 3805	TA		-	1.44	-	1.60	-	1.70	-	1.70	-	6.44
12	AO 3807	POL		-	2.00	-	2.00	-	2.00	-	2.00	-	8.00
G. Total					24.97		22.16		24.82		27.76		99.70

**COMMAND AREA DEVELOPMENT (CAD) COMPONENT OF JALALPUR
IRRIGATION PROJECT (JIP)**

TERMS OF REFERENCE (TORS)

OF

COMMAND AREA DEVELOPMENT CONSULTANTS (CADC)

It is planned to recruit/ engage Command Area Development Consultants (CADCs) for command area development activities under JIP for implementation supervision and third party validation of project activities. The consultant's main responsibilities would be design review/approval, construction supervision, quality assurance, technical assistance, and overall coordination of project execution. The consultants' team will primarily reports to the Director General Agriculture (Water Management)/ Project Director. The Consultant Selection Committee (CSC) will recruit the consultants in accordance with ADB guidelines for selection of consultants using the Quality and Cost Based Selection (QCBS) method at 80:20 quality-cost ratio.

The consultancy services for project implementation supervision are required to supervise and ensure that the activities of Command Area Development Component of JIP are executed in an orderly manner with a high standard of workmanship and specified quality of materials within the envisaged implementation period and in conformity to best possible and latest technical (design, specification and drawing) social and environmental standards. The tasks and activities include, but not limited, to:

A. Project Implementation Supervision Task

- i) Prepare standards and specifications for watercourse construction works, HEIS equipment, LASER land leveling, water storage ponds, solar powered pumping station etc. as well as other extension activities
- ii) Draft technical documents/agreements/formats for Supply and Services Companies (SSCs) including contract conditions, specifications for design, materials and installation of equipment, itemized list of typical items etc.
- iii) Provide support in procurement process e.g. pre-qualification, advertising invitations to bid, evaluation of bids and make recommendations as well as prepare all relevant documents for award of contracts.
- iv) Provide project management support services to the DGA (WM)/ PD.
- v) Assist in mobilization and screening of farmers for watercourse development/ HEIS/LASER land levelling etc. as per criteria.
- vi) Facilitate in finalization of rates for various items and services.
- vii) Provide resident supervision on PCPS yards through deployment of Engineers/ Sub-engineers.
- viii) Inspect and advise on standards, specifications, and criteria for construction materials/equipment etc.
- ix) Review and approve plans, designs, cost estimates for watercourses, HEISs, LASER land leveling, water storage ponds, solar powered pumping station etc.
- x) Facilitate timely completion of works and recommend onsite design modifications.
- xi) Spot check for quality of works during construction of a minimum of one third by their number.

- xii) Certify quantities and quality of completed works and delivered equipment for watercourse improvement, HEISs and LASER land leveling, water storage ponds, solar powered pumping station etc.
- xiii) Verify financial resource transfer applications.
- xiv) Notify the DGA (WM)/ PD of compliance / non-compliance of works with agreed criteria and standards.
- xv) Submit monthly, quarterly, and annual reports for proposed project activities besides other periodic reports as per requirements of project management.
- xvi) Provide technical support for training of stakeholders in all project interventions, particularly relating to high efficiency irrigation systems as well as new water management techniques and technologies.
- xvii) Develop online database and its management for all project interventions for efficient project management.
- xviii) Responsible for submission of reconciled physical and financial reports for its onward submission to the donor/ ADB and government.
- xix) Liaise with provincial, divisional, and district project management for smooth execution of field activities.
- xx) Extend technical support to maintain a website containing information on facilities and services, applications, procedures etc.
- xxi) support in project management based on modern concepts, implementation of works, including social and environmental management program, implementation of the communication strategy and plan, including support to Director General Agriculture (WM) Punjab for preparation of project implementation plans, expenditure planning, budgeting and financing forecast and work plans, as required by the government and financing agency(s) of the project as well as assistance in developing the procurement plans, contract management, and financial management.

B. Monitoring and Evaluation Task

- i. Develop the overall framework of monitoring and evaluation plan including collecting, analysing, and reporting project data for continual effective tracking of project development objectives
- ii. Work on formulated set of key performance indicators and means of assessment against these indicators for project activities to be implemented
- iii. Monitor and evaluate the implementation of project activities and their outcomes and impacts on socio-economic welfare of farming community in project areas
- iv. Propose recommendations about project modalities to ensure achievement of envisaged development objectives
- v. Contribute in development of annual work plan, ensuring alignment with project strategy, agreement on annual targets and inclusion of M&E activities in the work plan
- vi. Oversee and execute M&E activities of water management practices and techniques with particular focus on results and impacts as well as in lesson learning
- vii. Any other duty assigned by the project management

Specific Scope of Key Services

Watercourse Development and Construction

- i) Review the already developed standards and specifications for civil works on

- watercourses and improve the same as per latest requirements to assure compliance with agreed criteria
- ii) Assist in mobilization of water users associations (WUAs) and selection of watercourses as per criteria.
 - iii) Facilitate in finalization of rates for construction materials
 - iv) Verify rate assessment of construction materials to be procured by the procurement committee for civil work
 - v) Check surveys carried out by the OFWM staff
 - vi) Review and approve plans, designs, cost estimates for watercourses
 - vii) Check for quality of works during construction according to the agreed quality assurance plan, facilitate timely completion of civil works and recommend onsite design modifications.
 - viii) Recommend financial transactions/ funds transfer to WUA/ SSCs as per approved criteria
 - ix) Certify quality and quantity of completed civil works

High Efficiency Irrigation Systems

- i) Review the designs of the High Efficiency Irrigation Systems
- ii) Provide technical assistance in preparation of the design and specification, and cost estimation of the HEIS schemes, prepare guidelines, standardized criteria etc.
- iii) Prepare technical documents/agreement for SSCs including contract conditions, specifications for design, materials and installation of equipment, itemized list of typical items etc.
- iv) Assist in evaluation of the technical and financial proposals of SSCs
- v) Assist in mobilization and screening of farmers
- vi) Facilitate in finalization of rates for various items and services required for system installation
- vii) Review and approve plans, designs, cost estimates prepared by the SSCs for HEIS
- viii) Check quality of material delivered at the site by SSCs, conformity with specified standards and quantities based on an agreed quality assurance plan
- ix) Certify quantities and quality of all completed works for payments of systems cost to SSCs
- x) Prepare completion certificates, measurements of the works, and disbursement applications for the GoPunjab and the financier of the Project
- xi) Provide technical support for training of OFWM staff in high efficiency irrigation systems
- xii) Review and advise on standards, specifications and criteria for high efficiency irrigation system best suited to local conditions
- xiii) Facilitate timely completion of intended works and recommend onsite design modifications
- xiv) Check for quality of works during installation based on agreed quality assurance plan
- xv) Verify financial resource transfer applications at various stages of works execution

- xvi) Prepare operation, maintenance and management manuals for high efficiency irrigation systems

LASER land Leveling

- i) Assist in prequalification/shortlisting of service providers for LASER land leveling services
- ii) Assist in evaluation of the bids and award of contracts during prequalification/bidding process of service providers to ensure selection of competent firms and quality services
- iii) Assist in short listing of applicants for LASER land leveling
- iv) Certify quantities and quality of LASER land levelling conformity with specified standards and quantities for payments to service provider
- v) Provide technical support for training of farmers/service providers in LASER land levelling
- vi) Prepare operation, maintenance and management manuals farm layout planning and LASER land levelling

The consultants will be designated as “the Engineer” and undertake agreements in respect of civil works, goods, equipment etc. to be procured under the project, and will be responsible for inspection of these works in order to ensure that civil works undertaken and goods & equipment supplied are in accordance with the designs, specifications and terms & conditions of the relevant contracts and standards. The consultants shall ensure that procurement of goods, services, civil works contracts are in accordance with the approved policies and guidelines, the contracts are signed, and managed properly including any changes or variation orders during implementation.

The consultants will provide support to Director General Agriculture (Water Management)/ PD in overall project management activities such as preparation of project implementation plans, expenditure planning, budgeting and financing forecast and plans, monthly, quarterly and annual progress reports or work programs as required by the Government of Punjab and financiers of the project. They will also help in developing the procurement plans, contract management, and financial management. The plans will be updated on a regular basis as required by Client.

Team Composition & Qualification Requirements for the Key Experts

The consultants will be encouraged to use the expertise available in Pakistan to the extent possible. However, international experience and experience with the ADB financed projects are necessary to carry out the assignment. The consultants are free to propose a staffing plan and skill mix in order to ensure that necessary requisite objectives and scope of services are achieved. If all the required skills are not available within the consulting firms, they are encouraged to make joint ventures with other firms. The detail of consulting service inputs is given in Tables below.

Position/ Expert	man-months
Project Manager/ OFWM Specialist	48
Financial Management Specialist	24
Irrigation Agronomist	24
M&E Specialist	48
Agriculture Economist	24
Design Engineer	48
Field Engineer In-charge/ Field Coordinator	48
Field Engineers	240
GIS Specialist	24
Resident Engineers/ Support Staff	318
Total	846

Sr. No.	Name of Expert	Positions	Tentative man-months				
			Year I	Year II	Year III	Year IV	Total
1	Project Manager/ OFWM Specialist	1	12	12	12	12	48
2	Financial Management Specialist	1	6	6	6	6	24
3	Irrigation Agronomist	1	6	6	6	6	24
4	M&E Specialist	1	12	12	12	12	48
5	Agriculture Economist	1	6	6	6	6	24
6	Design Engineer	1	12	12	12	12	48
7	Field Engineer Incharge/ Field Coordinator	1	12	12	12	12	48
8	Field Engineers	5	60	60	60	60	240
9	GIS Specialist	1	6	6	6	6	24
10	Resident Engineers/ Support Staff	8	30	96	96	96	318
	Total	21	162	228	228	228	846

Project Manager/ OFWM Specialist (National, 48 person-months, one position)

Qualifications: The Team Leader will possess a Master's degree or its equivalent in Agricultural Engineering / Water Resources Engineering / Irrigation Engineering after B.Sc. Agri. Engineering with 15 years' experience including implementation of multi sectoral projects preferably ADB financed and involving social mobilization. A minimum of 10 years of experience will be required in the management of similar consultancy services with demonstrated ability to work with government officials, technical field staff, NGO representatives, and farmers. In addition, the Team Leader would be required to have familiarity with the principles and practices of participatory community development, irrigated agriculture, water management related issues, and knowledge of project management information systems besides having fluency in spoken and written English. Responsibilities of the Project Manager/ OFWM Specialist will be, but not limited, to the following:

- i) Report to the Client/ DGA (WM)/ PD
- ii) Assume overall responsibility for management of the CAD consultants' team
- iii) Work as the "the Engineer" as per Client's agreement with the Water Users Associations (WUAs)/ beneficiary farmers/ service providers to supervise construction/installation/equipment delivery etc. with the best professional and consulting standards to ensure that the scheme/task is completed satisfactorily
- iv) Keep the Client informed of technical issues and the progress of all works both by direct contacts and through discussions or correspondence
- v) Attend, at Project level, all meetings as required and keep a record of all such meetings.
- vi) Assist the Client in any project issue which the Employer may require
- vii) Ensure preparation of a project completion report (PCR)
- viii) Assist the Client in preparing the response to Audit Objections
- ix) Assist the Client in preparing response to financiers or other authority's queries, observations, requirements etc.
- x) Provide technical input in smooth implementation of planed activities
- xi) Coordinate with all related Client's organizations for project issues

Financial Management Specialist (National, 24 person-months, one position)

Qualifications: The Financial Management Specialist (FMS) should have degree of Chartered Accountant or ACMA/ACCA with at least five (5) years of work experience in financial management in public sector organization preferably under a donor assisted project. Financial Management Specialist will be responsible for provision of technical guidance and expertise in the financial management activities under the project within the framework of prescribed policies and guidelines of the government and the ADB. The FMS will provide comprehensive support to the Directorate General Agriculture (WM) regarding establishment and maintenance of finance and accounting systems, processes and procedures, and ensuring adherence to the same. Major responsibilities of FMS will include, interalia, the followings.

- i. Provide technical assistance to Director General Agriculture (WM) for financial management activities
- ii. Ensure strategic guidance about overall operations of the project
- iii. Assist in managing all accounts, budget and audit matters
- iv. Supervise in preparing cash flows, their planning, and management
- v. Support in dealing with the Bank on financial management issues
- vi. Monitor the financial resources and accounting to ensure accuracy and reliability of financial reports
- vii. Establish an efficient, accurate and updated reporting mechanism, preferably a real time transaction recording and reporting system including asset register management, receipt book and cash book keeping, invoice register management, contract register, contract ledger management etc.
- viii. Consolidate the periodic financial progress reports and submission to the DGA (WM) for review/approval and/or all stakeholders in accordance with the prescribed requirements
- ix. Prepare and coordinate various financial reports as may be required by any government agency

- x. Organize cash management processes, including liquidity management, recommendation about imprest level, risk assessment, bank relationship management, timely accounting and reconciliation of all transactions, security for cash assets on site etc.
- xi. Carry out capacity building of the provincial, regional and district level finance & accounts teams
- xii. Ensure carrying out internal and external audits timely and regularly to improve financial process as well as suggest corrective actions on all recommendations/ observations
- xiii. Help in securing approvals of competent authority regarding budget allocations and release of funds
- xiv. Any other relevant duties assigned by the Director General Agriculture (WM)

Irrigation Agronomist (National, 28 person-months, one position)

Qualifications: The Irrigation Agronomist should possess a Master's degree in Agriculture/ Agricultural Engineering or similar degree with specialization in Irrigation Agronomy and 10 years work experience including at least three (3) year work experience in related field under the water management projects. Work experience in related computer tools, good communication skills, fluency in English and proven satisfactory record of similar consultancies would be preferred.

- i. Assist the project management in implementation of OFWM and extension related activities
- ii. Develop guidelines and technical manuals about agronomy of different crops sown in the area for professionals and farmers for successful crop production
- iii. Prepare and implement plans for devising crop production technology including land preparation, planting, irrigation scheduling, inter-culture, fertigation, harvesting, processing and marketing under modern irrigation technologies
- iv. Estimate crop water requirements (CWR) by using climatic data (rainfall, sunshine, humidity, wind speed, temperature etc.) for soil moisture monitoring and proper irrigation scheduling in the project area
- v. Supervise demonstration and evaluation of modern irrigation and crop production techniques
- vi. Assist the Extension wing in carrying out their envisaged activities
- vii. Assist in preparation of most feasible cropping patterns under project interventions and water availability
- viii. Compile and analyze the reports on agronomic aspects of crop and water management for proposing recommendations
- ix. Participate in field visits & provide necessary input for crop and irrigation management
- x. Prepare training curriculum and carryout capacity building programs for technical staff and farmers about irrigation agronomy
- xi. Any other relevant duties assigned by the project management

M&E Specialist/ Team Leader (National, 48 person-months, one position)

Qualifications: The M&E will possess a Master's degree or its equivalent in Agricultural

Engineering / Water Resources / Irrigation Engineering/ Natural Resources with 10 years' experience including monitoring and evaluation of modern water management interventions of multi sectoral projects preferably ADB financed. A minimum of 5 years of experience will be required for promoting on farm water management interventions with demonstrated ability to work with government officials, technical field staff, NGO representatives, and farmers will be preferred. Responsibilities of the M&E Specialist/ Team Leader will be but not limited to the following:

- i. Lead the consultant's M&E team for provision of technical assistance to Director General Agriculture (WM/ PD/ Client in monitoring and evaluation of project activities and impacts
- ii. Supervise implementation of overall monitoring and evaluation plan including collecting, analyzing, and reporting project data for continual effective tracking of project objectives
- iii. Carry out impact evaluation of project activities to assess the project benefits
- iv. Monitor project activities to ensure implementation of project activities in accordance with the prescribed standards, specifications, and parameters
- v. Carry out continuous monitoring of the designing plans and maintain liaison with implementation staff/ other stakeholders
- vi. Assist in reviewing and modifying the project activities for cost effectiveness and technical suitability
- vii. Ensure adoption of international/ national standards for monitoring of project activities
- viii. Submit monthly and quarterly / yearly M&E reports acceptable to the clients
- ix. Perform other duties as assigned by the Client

Agricultural Economist (National, 24 person-months, one position)

Qualifications: The Agricultural Economist will possess a Master's degree in Economics/ Agricultural Economics/ Development Economics with specialization preferably in Monitoring & Evaluation and 10 years of work experience including at least 5 years in implementation of water management projects at field level in agricultural and rural development sectors. The work experience in a developed country in related field particularly high efficiency irrigation and demonstrated ability to work with government officials, technical field staff, NGO representatives, and farmers would be preferred. Work experience in related computer tools, ADB rules/procedures, good communication skills, fluency in English, and proven satisfactory record of similar consultancies would be preferred. Responsibilities of the Agricultural Economist will be but not limited to the following:

- i. Prepare/refine log frames/ formats for baseline and periodic surveys for establishing pre-project dataset as well as for capturing temporal changes
- ii. Lead the field staff in collection of periodic/seasonal data planning field activities, project review, impact assessment etc.
- iii. Collect, compile and analyze the data regarding different components/activities against envisaged project objectives
- iv. Assist in modification of M&E and data collection plans on the basis of the information collected from the field on different aspects
- v. Establish a framework for involving beneficiary communities in the M&E process and internalizing beneficiary feedback in project implementation path

- vi. Assess the project impact and work out socio-economic benefits of project interventions and submit quarterly/ yearly reports acceptable to the clients
- vii. Impart guidance and training on M&E concepts and tools to project stakeholders
- viii. Any other relevant duties assigned by the project management

Design Engineer (National, 48 person-months, one position)

Qualifications: The Design Engineer should possess a Master's degree in Irrigation Engineering/Agricultural Engineering/ Civil Engineering/ Water Resources Engineering after B.Sc. Agricultural Engineering with 10 years' work experience including at least three (3) years' experience in on farm water management under the irrigated agriculture development projects. Work experience in related computer tools, good communication skills, fluency in English and proven satisfactory record of similar consultancies would be preferred. Responsibilities of the Design Engineer will be but not limited to the following:

- i) Supervise the designs of envisaged interventions and provide technical assistance/ backstopping
- ii) Monitor the designing process carried out by the supply & service companies/ service providers to ensure economic designs in accordance with the prescribed standards, specifications, and parameters
- iii) Carry out continuous monitoring of the designing plans and maintain liaison with implementation staff/ other stakeholders
- iv) Assist in reviewing and modifying the designs of project interventions for cost effectiveness and technical suitability
- v) Coordinate for ensuring adoption of international/ national standards for designs
- vi) Perform other duties as assigned by the project management/ client

Field Engineer In-charge/ Field Coordinator (National, 48 person-months, one position)

Qualifications: The Field Engineer In-charge/ Field Coordinator should possess a Bachelor degree in Agricultural Engineering/ Civil Engineering or related field with 10 years' work experience including at least five (5) years' experience in on farm water management under the irrigated agriculture development projects. Work experience in related computer tools, coordination, good communication skills, fluency in English and proven satisfactory record of similar consultancies would be preferred. Responsibilities of the Field Engineer In-charge/ Field Coordinator will be but not limited to the following:

- i) Lead the Field Engineers team and coordinate project activities amongst various stakeholders
- ii) Assist the Project Manager in project implementation supervision activities
- iii) Attend all meetings as required and keep a record of all such meetings
- iv) Supervise checking and approval of field survey, design and cost estimates
- v) Coordinate and monitor/ supervise all project activities undertaken in the field and ensure quality as well as quantity of envisaged works
- i) Develop close liaison with project stakeholders including project management, private sector service providers, farmers etc.
- ii) Undertake any other relevant duties assigned by the Client/project management

Field Engineer (National, 240 person-months, 5 positions)

Qualifications: The Field Engineer should possess a Bachelor degree in Agricultural Engineering and five (5) years work experience including at least three (3) years in on farm water management projects. Work experience in related computer tools, good communication skills, fluency in English and proven satisfactory record of similar consultancies would be preferred. Responsibilities of the Field Engineer will be but not limited to the following:

- i) Coordinate and supervise the construction/installation activities
- ii) Ensure quality as well as quantity of works by spot-checking of envisaged interventions
- iii) Certify funds for ongoing as well as completed works as per approved procedures
- iv) Bring any deficiency into the notice of the controlling officers of district and provincial governments.
- v) Develop close liaison with project stakeholders including project management, SSCs and the farmers.
- vi) Any other relevant duties assigned by the project management

GIS Specialist (National, 24 person-months, one positions)

Qualifications: GIS Specialist should possess Master degree in Remote Sensing & GIS with at least 5 years of work experience in GIS applications in public/ private sector organization preferably under a donor assisted project. GIS Specialist would be responsible for provision of technical guidance and expertise in the development and management of GIS database of all project activities. He/she will provide comprehensive support to the client regarding database maintenance, data verification, updation of information, upgradation of system for use of data for planning and monitoring activities. Major responsibilities of the consultant will include, interalia, the followings.

- i) Provide technical assistance to Director General Agriculture (WM)/ PD in developing GIS maps of planned interventions
- ii) Develop GIS applications on different platforms (i.e. ESRI products/ ERDAS Imagine/ ER-Mapper / MapInfo etc.) for project activities
- iii) Supervise image processing/ interpretation and analysis
- iv) Carryout data digitization and geo database development
- v) Manage map production and printing
- vi) Administer spatial data analysis and management
- vii) Organize collection of necessary field data for completion, updating and up-gradation of GIS database
- viii) Build capacity of OFWM staff in operation, application and management of GIS database, use of GPS and latest GIS software i.e. ArcView, ArcGIS etc.
- ix) Demonstrate ways to use OFWM GIS database as a management tool in an optimal manner for project planning & monitoring
- x) Produce project maps as and when required by the Director General Agriculture (WM)/ PD

Resident Engineers (318 person months, about 8 positions): RE will possess B.Sc. Agricultural Engineering degree and would be responsible for provision of resident supervision in fabrication of Pre-cast Concrete Parabolic Segments (PCPS) in yards for watercourse lining.

Command Area Development of Jalalpur Irrigation Project (CAD-JIP)

Requirement of Transport, Machinery and Equipment

(Rupees)

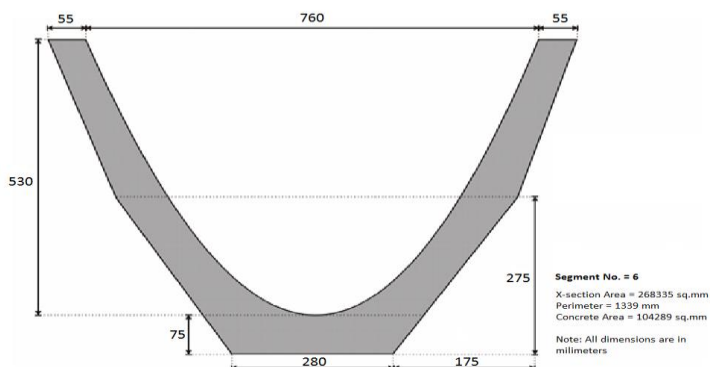
S.No.	Particulars	Unit	Requirement	Unit Cost (Rs.)	Total Cost
I) A09203-IT EQUIPMENT					
1	Computer Desktop	No.	5	150,000	750,000
2	Laser Printer	No.	5	50,000	250,000
3	Color Printer	No.	5	75,000	375,000
4	Laptop	No.	5	175,000	875,000
5	Internet Devices/ Communication Facility/ EVO	No.	5	5,000	25,000
Sub-total (I)					2,275,000
II) A09501-TRANSPORT					
1	Car (1300 CC)	No.	1	2,000,000	2,000,000
2	Car (1000 CC)	No.	3	1,500,000	4,500,000
2	Double Cabin Pickups (3000 CC) 4x4	No.	4	4,000,000	16,000,000
3	Motorcycle	No.	25	80,000	2,000,000
Sub-total (II)					24,500,000
III) A09601-PLANT & MACHINERY					
1	Photostat Machine	No.	5	300,000	1,500,000
3	Digital Level Set	No.	25	150,000	3,750,000
Sub-total (III)					5,250,000
IV) A09701-FURNITURE & FIXTURE					
1	Furniture & Fixture	L/S		-	1,000,000
Sub-total (IV)					1,000,000
Grand Total (I+II+III+IV)					33,025,000
Rs. Million					33.025

Command Area Development of Jalalpur Irrigation Project (CAD-JIP) Unit Cost for Watercourse Development and Construction (PCPS Lining)

1. Cross Section of a Typical Watercourse

PCPS Size (Segment # 6)

Maximum Height, D	530 mm
Maximum Width, T	760 mm
Designed Flow Depth, d	410 mm
Free Board, FB	120 mm



2. Basic Data of a Typical Watercourse to be Lined

Items	Unit	Quantity	Unit Volume (m ³)	Total Volume (m ³)
Length of Watercourse	m	4,100		
Design Discharge	lps	80		
Average Slope	m/m	0.004		
Anticipated lining length	m	2,050		
Nakka Structures (0.51 m dia)	No.	40	0.52	20.80
Culvert	No.	3	5.00	15.00
Sign Board	No.	1	0.50	0.50
Drop Structure	No.	3	0.25	0.75
Animal Wallows	No.	0.10	15.00	1.50
				38.55

3. Estimated Materials & Cost

Items	Unit	Quantity	Unit Cost (Rs.)	Total Cost (Rs.)
PCPL Segments (# 6)	No.	2,242	1,700 /Segment	3,811,076
Bricks	No.	19,275	6,500 /1,000	125,288
Cement (including Joints)	bag	92	600 /bag	55,251
Sand (including in bed)	m ³	115	750 /m ³	86,608
Nakkas	No.	40	900 /nakka	36,000
Total Cost of Material				4,114,223
Material Cost per Running Meter (Rs.)				2,007

4. Cost of Labor & Masons (Farmers' Share)

Items	Quantity	Unit Rate (Rs.)	Labor (Rs.)	Masons (Rs.)	Total
Construction of earthen channel (0.2 men-days/meter)	4,100	450	369,000		369,000
Excavation /pad work of section to be lined (0.2 men-days/meter)	2,050	450	184,500		184,500
PCP Segments laying, jointing and back earth filling	2,050	300	307,500	307,500	615,000
Installation of nakkas	40	900	18,000	18,000	36,000
Construction of culverts	3	9,000	13,500	13,500	27,000
Construction of animal wallows	0.10	20,000	1,000	1,000	2,000
Construction of drop structures	3	900	1,350	1,350	2,700
Construction, painting and writing of sign board	1	3,500	1,750	1,750	3,500
Total Labor & Masons			896,600	343,100	1,239,700

5. Overall Unit Cost of Watercourse Improvement

Items	%	Amount (Rs.)
Cost of materials	77	4,114,223
Cost of construction of earthen channel	7	369,000
Cost of labor for civil works	10	527,600
Cost of Masons	6	343,100
Total	100	5,353,923

6. Cost Sharing

Distribution	Share	Amount (Rs.)
Government Share	84%	4,483,223
Farmers' Share	16%	870,700
Total	100%	5,353,923

Command Area Development of Jalalpur Irrigation Project (CAD-JIP)

Unit Cost of Drip Irrigation System for 5 Acres Vegetables with Drip

S.No	Description	Make	Standard Specification	Unit	Rate (RS.)	5-Acre (VEGETABLES)	
						QTY	Cost (Rs.)
Pump Set and Primer mover							
1	Pump	* KSB	2.5"x2" (50-160)	Nos	79,567	1	79,567
2	Motor	* KSB	7.5HP	Nos	34,957	1	34,957
3	Motor control panel	* Local	7.5HP (DOL)	Nos	5,429	1	5,429
4	Base plate and coupling for motor & Pump	* Local		Nos	8,715	1	8,715
Sub Total							128,668
PVC Pipes							
1	PVC Pipe (3")	* ISO Certified	BS- 3505/B-Class	m	285	80	22,800
2	PVC Pipe (2.5")	* ISO Certified	BS- 3505/C-Class	m	253	130	32,890
3	PVC Pipe (2")	* ISO Certified	BS- 3505/C-Class	m	169	35	5,915
4	PVC Pipe (1.5")	* ISO Certified	BS- 3505/D-Class	m	136	215	29,240
5	PVC Fittings and Accessories (15%)	*		LS	0.15		13,627
Sub Total							104,472
Filtration and Fertigation							
1	Media Filter	ISO Certified	20m3/hr	Nos	35,934	1	35,934
2	Disc Filter	ISO Certified	20m3/hr	Nos	12,505	1	12,505
3	Ventury Assembly	ISO Certified	2"	Nos	5,565	1	5,565
4	Fertigation Manifold	ISO Certified	2x1.5"	Nos	6,965	1	6,965
5	GM Valve, PN-16	* ISO Certified	2"	Nos	2,468	2	4,936
6	Pressure Gauges Glyc. filled	* ISO Certified	1-10bar	Nos	954	4	3,816
7	Head unit fittings including suc.pipe and foot valve (2")	*		Nos	18,718	1	18,718
Sub Total							88,439
Emitting system							
1	Drip line Plain (1.1 mm)	ISO Certified	16mm	m	18	400	7,200
2	Integrated drip line, 16mm (Min. 0.9mm WT)	ISO Certified	At 0.40m dripper spacing	m	18	17,000	306,000
3	GTOs	ISO Certified	16mm	Nos	12	300	3,600
4	Joiner	ISO Certified	16mm	Nos	8	300	2,400
5	End cap	ISO Certified	16mm	Nos	9	300	2,700
Sub Total							321,900
Valves							
1	PVC Ball valve with Union	* ISO Certified	63mm	Nos.	1,502	6	9,012
2	Air Release valve (Plastic)	* ISO Certified	1"	Nos.	795	2	1,590
3	Flush valve	* ISO Certified	63mm	Nos	157	7	1,099
4	Non return valve	* ISO Certified	2"	Nos.	2,211	1	2,211
5	Flow meter (elster Kent)	* ISO Certified	2"	Nos.	26,250	1	26,250
6	Trenching and back filling			RFT	16	722	11,199
7	Civil Work (H.U. Foundation+Sign Board)			LS	12,000	1	12,000
Sub Total							63,361
Total Cost (Rs.)							706,840
Survey, Design and estimates @ 15,000 per site				LS	15,000	1	15,000
Transportation cost @ 20,000 per site				LS	20,000	1	20,000
Installation charges				LS	26,200	1	26,200
SSC Overhead & Profit @ 20%							153,608
Service Chages @ 6%				LS	0.06		42,410
General Sales Tax *						0.17	51,131
Grand Total Cost Excluding Storage Pond							1,015,190
Per acre cost (Rs.)							203,038

Command Area Development of Jalalpur Irrigation Project (CAD-JIP)

Unit Cost of Drip Irrigation System for 5 Acres Orchard

S.No	Description	Make	Standard Specification	Unit	Rate (RS.)	5-Acre (ORCHARD) 10 x 20 ft	
						QTY	Cost (Rs.)
Pump Set and Primer mover							
1	Motor control panel	* Local	7.5HP (DOL)	Nos	5,429	1	5,429
2	Mono Block Pumpset	* Local (Meco)	7.5 HP (2" x 1.5") KSM-40-20	Nos	59,635	1	59,635
Sub Total							65,064
PVC Pipes							
1	PVC Pipe (3")	* ISO Certified	BS- 3505/ B-Class	m	285	134	38,190
2	PVC Pipe (2")	* ISO Certified	BS- 3505/C-Class	m	169	197	33,293
3	PVC Pipe (1.5")	* ISO Certified	BS- 3505/D-Class	m	136	6	789
4	PVC Pipe (1.25")	* ISO Certified	BS- 3505/D-Class	m	111	64	7,104
5	PVC Fittings and Accessories (15%)	*		LS	0.15		11,906
Sub Total							91,282
Filtration and Fertigation							
1	Media Filter	ISO Certified	25m3/hr	Nos	44,918	1	44,918
2	Disc Filter	ISO Certified	25m3/hr	Nos	17,967	1	17,967
3	Ventury Assembly	ISO Certified	1"	Nos	2,783	1	2,783
4	Fertigation Manifold	ISO Certified	2x1.5"	Nos	6,965	1	6,965
5	GM Valve, PN-16	* ISO Certified	2"	Nos	2,468	1	2,468
6	Pressure Gauges Glyc. filled	* ISO Certified	1-10bar	Nos	954	4	3,816
7	Head unit fittings including suc.pipe and foot valve (2")	*		Nos	18,718	1	18,718
Sub Total							97,635
Emitting system							
1	Drip line Plain (1.1 mm)	ISO Certified	16mm	m	18	8,800	158,400
2	Dripper (NPC)	ISO Certified	14LPH	m	10	5,002	50,020
3	GTOs	ISO Certified	16mm	Nos	12	200	2,400
4	Joiner	ISO Certified	16mm	Nos	8	200	1,600
5	End cap	ISO Certified	16mm	Nos	9	200	1,800
Sub Total							214,220
Valves							
1	PVC Ball valve with Union	* ISO Certified	63mm	Nos.	1,502	3	4,506
2	PVC Ball valve with Union	* ISO Certified	50mm	Nos.	1,237	2	2,474
3	Air Release valve (Plastic)	* ISO Certified	1"	Nos.	795	1	795
4	Flush valve	* ISO Certified	63mm	Nos	157	3	471
5	Flush valve	* ISO Certified	40mm	Nos	139	2	278
6	Non return valve (Kitz Local)	* ISO Certified	1.5"	Nos.	1,404	1	1,404
7	Non return valve	* ISO Certified	2"	Nos.	2,211	1	2,211
8	Flow meter (elster Kent)	* ISO Certified	1.5"	Nos.	17,625	1	17,625
9	Trenching and back filling			RFT	16	886	13,745
10	Civil Work (H.U. Foundation+Sign Board)			LS	12,000	1	12,000
Sub Total							55,509
Total Cost (Rs.)							523,710
Survey. Design and estimates @ 15,000 per site				LS	15,000	1	15,000
Transportation cost @ 20,000 per site				LS	20,000	1	20,000
Installation charges				LS	26,200	1	26,200
SSC Overhead & Profit @20%					0.20		116,982
Service Chages @ 6%				LS	0.06		31,423
General Sales Tax *					0.17		35,889
Grand Total Cost Excluding Storage Pond							769,203
Per acre cost (Rs.)							153,841

Command Area Development of Jalalpur Irrigation Project (CAD-JIP)
Estimated Phasing of Physical Targets

Sr. No.	Particulars	Units	Year-I (2019-20)	Year-II (2020-21)	Year-III (2021-22)	Year-IV (2022-23)	Total
A. Community Watercourse Development							
A-1	Social Mobilization, Organization and Registration of Water Users Associations	Nos.	50	150	200	85	485
A-2	Watercourse Development and Lining (upto 50%)	Nos.	5	105	200	175	485
B. Improving Water Productivity							
B-1	LASER Land Leveling	Acres	2,000	7,000	12,000	9,000	30,000
B-2	Installation of High Efficiency Irrigation Systems (HEIS)	Acres	100	500	800	600	2,000
B-3	Construction of Water Storage Ponds and Solar Powered Pumping Stations	Nos.	-	2	8	10	20
C. Awareness Creation, Training, Capacity Development, Demonstration and Private Agriculture Support Services (PASS)							
C-1	Awareness Creation, Communication, Training & Capacity Building of Farmers	Nos.	100	600	1,000	1,300	3,000
C-2 Demonstration and Extension Services							
i)	Demonstration Plots	Nos.	166	166	166	166	664
ii)	Farmer Field Schools	Nos.	100	100	100	100	400
iii)	Provision of Hand Sprayers	Nos.	300	300	300	300	1,200
iv)	Provision of Rabi Drills	Nos.	30	30	30	30	120
v)	Organization of Farmer Days/ Seminars/Workshops	Nos.	25	25	25	25	100
D Command Area Development Consultancy and Project Management Support							
	Command Area Development Consultants (CADC)	MM	162	228	228	228	846

Command Area Development of Jalalpur Irrigation Project (CAD-JIP)

Estimated Phasing of Financial Outlay

Sr. No.	Particulars	Unit Cost	Year-I (2019-20)	Year-II (2020-21)	Year-III (2021-22)	Year-IV (2022-23)	Total	%age				
A. Community Watercourse Development												
A-2 Watercourse Development and Lining (upto 50%)												
	i) Government Share (83%)	4.48	22.416	470.738	896.645	784.564	2,174.363					
	ii) Farmers' Contribution (17%)	0.87	4.354	91.424	174.140	152.373	422.290					
	Sub-Total	5.35	26.770	562.162	1,070.785	936.936	2,596.652	65.6				
B. Improving Water Productivity												
B-1 LASER Land Leveling												
	i) Government Share (80%)	0.0048	9.600	33.600	57.600	43.200	144.000					
	ii) Farmers' Contribution (20%)	0.0012	2.400	8.400	14.400	10.800	36.000					
	Sub-Total (B-1)	0.006	12.000	42.000	72.000	54.000	180.000	4.5				
B-2 Installation of High Efficiency Irrigation Systems (HEIS)												
	i) Government Share (80%)	0.140	14.000	70.000	112.000	84.000	280.000					
	ii) Farmers' Contribution (20%)	0.035	3.500	17.500	28.000	21.000	70.000					
	Sub-Total (B-2)	0.175	17.500	87.500	140.000	105.000	350.000	8.8				
B-3 Construction of Water Storage Ponds and Solar Powered Pumping Stations												
	i) Government Share (80%)	2.800	-	5.600	22.400	28.000	56.000					
	ii) Farmers' Contribution (20%)	0.700	-	1.400	5.600	7.000	14.000					
	Sub-Total (B-3)	3.500	-	7.000	28.000	35.000	70.000	2.0				
C. Awareness Creation, Training, Capacity Development, Demonstration and Private Agriculture Support Services (PASS)												
C-1 Awareness Creation, Communication, Training & Capacity Building of Farmers												
			5.000	5.000	10.000	10.000	30.000					
C-2 Demonstration and Extension Services (demo plots, farmer field schools, purchase of machinery etc.)												
			25.220	22.200	24.700	27.580	99.700					
C-3 Private Agriculture Support Services (PASS) Lumpsum												
			-	10.000	20.000	20.000	50.000					
	Sub-Total (C)		30.220	37.200	54.700	57.580	179.700	4.5				
D. Command Area Development Consultancy and Project Management Support												
D-1 Command Area Development Consultants (CADC) PRA Sales Tax @ 16%												
			45.900	52.500	52.500	52.500	203.400	5.1				
			7.344	8.400	8.400	8.400	32.544					
	Sub-Total (D-1)		53.244	60.900	60.900	60.900	235.944	6.0				
D-2 Project Administrative and Management Cost												
	i) Non-recurring (vehicles, equipment etc.)		-	33.025	-	-	33.025					
	ii) Salaries and Administrative Cost		47.603	48.397	49.189	49.980	195.169					
	iii) Office Building (Lumpsum)		-	12.500	12.500	-	25.000					
	Sub-Total (D-2)		47.603	93.922	61.689	49.980	253.194	6.4				
	Sub-total (D)		100.847	154.822	122.589	110.880	489.138					
E Price Escalation/ Contingencies (@3% of civil works)												
			-	20.960	39.324	33.928	94.211	2.4				
	Total Project Cost (A+B+C+D+E)		187.337	911.644	1,527.397	1,333.325	3,959.702	100				
							37.711					
(i) Total Government Share							177.083	792.920	1,305.257	1,142.152	3,417.412	86.3
							US\$ M	32.547				
a) Punjab Government/ Counterpart Funding (CAD Consultant + Taxes)							62.907	182.687	289.515	258.250	793.360	20.0
							US\$ M	7.556				
b) Asian Development Bank (ADB)							114.176	610.233	1,015.742	883.902	2,624.052	66.3
							US\$ M	24.991				
(ii) Farmers' Contribution							10.254	118.724	222.140	191.173	542.290	13.7
							US\$ M	5.165				

**Command Area Development of Jalalpur Irrigation Project (CADJIP)
Project Supervision and Management Cost**

A. Provincial Headquarter/ Project Implementation Unit (PIU)

Sr. No.	Object Code	Post	No. of Posts	Basic Scale	Year-I (2019-2020)	Year-II (2020-21)	Year-III (2021-22)	Year-IV (2022-23)	Total
	A01	<u>Employees Related Expenses</u>							
I.	A01101	Basic Pay of Officers							
		Deputy Director Agriculture (OFWM)/ Liaison Officer	1	18+SP	633,000	667,000	701,000	735,000	2,736,000
		Procurement Specialist (Lumpsum Pay)	1		2,400,000	2,400,000	2,400,000	2,400,000	9,600,000
		Contract Management Specialist (Lumpsum Pay)	1		2,400,000	2,400,000	2,400,000	2,400,000	9,600,000
		Assistant Director (Tech.)	2	18	1,265,000	1,334,000	1,403,000	1,472,000	5,474,000
		Accountant	1	16	678,000	696,000	714,000	732,000	2,820,000
		Total :-	6		7,376,000	7,497,000	7,618,000	7,739,000	30,230,000
II.	A01151	Basic Pay of other Staff							
		Computer Operator	1	11	204,000	215,000	226,000	236,000	881,000
		Vehicle Driver	1	4	145,000	156,000	167,000	178,000	646,000
		Naib Qasid	1	1	132,000	143,000	154,000	165,000	594,000
		Total :-	3		481,000	514,000	547,000	579,000	2,121,000
		Total Pay (I+II) :-	9		7,857,000	8,011,000	8,165,000	8,318,000	32,351,000
III.	A012-1	<u>Regular Allowance</u>							
	A0120D	Integarated Allowance:			11,000	11,000	11,000	11,000	44,000
	A01202	House Rent Allowance			299,000	298,000	298,000	298,000	1,193,000
	A01203	Conveyance Allowance			318,000	318,000	318,000	318,000	1,272,000
	A01217	Medical Allowance			237,000	237,000	237,000	237,000	948,000
	A0120X	Adhoc Allowance (2016) 10 %			306,000	322,000	336,000	352,000	1,316,000
	A0122M	Adhoc Allowance (2017) 10 %			306,000	322,000	336,000	352,000	1,316,000
	A01270	Others (30 % S.S.B and Ph.D. Allowance)			597,000	597,000	597,000	597,000	2,388,000
	A01227	Project Allowance			1,000,000	1,000,000	1,000,000	1,000,000	4,000,000
		Total :-			3,074,000	3,105,000	3,133,000	3,165,000	12,477,000
IV.	A012-2	<u>Other Allowances Exl. T.A</u>							
	A01273	Honoraria			400,000	400,000	400,000	400,000	1,600,000
	A01274	Medical Charges			100,000	100,000	100,000	100,000	400,000
		Total:-			500,000	500,000	500,000	500,000	2,000,000
	A01	Total Employees Related Expenses			11,431,000	11,616,000	11,798,000	11,983,000	46,828,000

**Command Area Development of Jalalpur Irrigation Project (CADJIP)
Project Supervision and Management Cost**

B. Field / Assistant Director Agriculture (OFWM)

Sr. No.	Object Code	Post	No. of Posts	Basic Scale	Year-I (2019-2020)	Year-II (2020-21)	Year-III (2021-22)	Year-IV (2022-23)	Total
	A01	<u>Employees Related Expenses</u>							
I.	A01101	Basic Pay of Officers							
		Water Management Officer	4	17	2,010,000	2,120,000	2,230,000	2,340,000	8,700,000
		Total :-	4		2,010,000	2,120,000	2,230,000	2,340,000	26,037,000
II.	A01151	Basic Pay of other Staff							
		Water Management Supervisor	25	11	5,091,000	5,355,000	5,619,000	5,883,000	21,948,000
		Computer Operator	2	11	407,000	428,000	450,000	471,000	1,756,000
		Vehicle Driver	2	4	290,000	301,000	312,000	322,000	1,225,000
		Rodman	29	1	3,682,000	3,783,000	3,884,000	3,985,000	15,334,000
		Total :-	58		9,470,000	9,867,000	10,265,000	10,661,000	40,263,000
		Total Pay (I+II) :-	62		11,480,000	11,987,000	12,495,000	13,001,000	66,300,000
III.	A012-1	<u>Regular Allowance</u>							
	A0120D	Integarated Allowence:			167,000	167,000	167,000	167,000	668,000
	A01202	House Rent Allowance			1,100,000	1,100,000	1,100,000	1,100,000	4,400,000
	A01203	Conveyance Allowance			1,589,000	1,589,000	1,589,000	1,589,000	6,356,000
	A01217	Medical Allowance			1,044,000	1,044,000	1,044,000	1,044,000	4,176,000
	A0120X	Adhoc Allowance (2016) 10 %			1,148,000	1,199,000	1,250,000	1,300,000	4,897,000
	A0122M	Adhoc Allowance (2017) 10 %			1,148,000	1,199,000	1,250,000	1,300,000	4,897,000
	A01270	Others (30 % S.S.B and Ph.D. Allowance)			2,246,000	2,246,000	2,246,000	2,246,000	8,984,000
		Total :-			8,442,000	8,544,000	8,646,000	8,746,000	34,378,000
IV.	A012-2	<u>Other Allowances Exl. T.A</u>							
	A01273	Honoraria			4,000,000	4,000,000	4,000,000	4,000,000	16,000,000
	A01274	Medical Charges			500,000	500,000	500,000	500,000	2,000,000
		Total:-			4,500,000	4,500,000	4,500,000	4,500,000	18,000,000
	A01	Total Employees Related Expenses							
					24,422,000	25,031,000	25,641,000	26,247,000	118,678,000

Command Area Development of Jalalpur Irrigation Project (CADJIP)
Project Supervision and Management Cost

C. Provincial Headquarter/ Project Implementation Unit (PIU)

Object Code	Particulars	No. of Posts	Basic Scale	Year-I (2019-2020)	Year-II (2020-21)	Year-III (2021-22)	Year-IV (2022-23)	Total
A03	Operating Expenses							
A032	Communication							
A03201	Postage & Telegraph			10,000	10,000	10,000	10,000	40,000
A03202	Telephone & T/Calls			100,000	100,000	100,000	100,000	400,000
A03204	Electronic Communication			50,000	50,000	50,000	50,000	200,000
	Total:			160,000	160,000	160,000	160,000	640,000
A033	Utilities				-	-		-
A03303	Electricity			100,000	100,000	100,000	100,000	400,000
A03304	Hot & Cold Charges			50,000	50,000	50,000	50,000	200,000
	Total:-			150,000	150,000	150,000	150,000	600,000
A034	Occupancy Costs				-	-		-
A03406	Rent for office buildings			-	-	-		-
A03407	Rate & Taxes			10,000	10,000	10,000	10,000	40,000
	Total:-			10,000	10,000	10,000	10,000	40,000
A038	Travel & Transportation				-	-		-
A03805	Traveling Allowance			1,000,000	1,000,000	1,000,000	1,000,000	4,000,000
A03807	P.O.L. Charges			1,000,000	1,000,000	1,000,000	1,000,000	4,000,000
	Total:-			2,000,000	2,000,000	2,000,000	2,000,000	8,000,000
A039	General				-	-		-
A03901	Office Stationery			150,000	150,000	150,000	150,000	600,000
A03902	Printing & Publication			50,000	50,000	50,000	50,000	200,000
A03905	News Papers & Periodical Books			20,000	20,000	20,000	20,000	80,000
A03907	Advertising & Publicity Charges			50,000	50,000	50,000	50,000	200,000
A03970	Other			100,000	100,000	100,000	100,000	400,000
	Total General:-			370,000	370,000	370,000	370,000	1,480,000
	Total Operating Expenses:-			2,690,000	2,690,000	2,690,000	2,690,000	10,760,000
A13	Repair & Maintenance of Durable Goods				-	-		-
A13001	Transport			1,000,000	1,000,000	1,000,000	1,000,000	4,000,000
A13101	Macinery & Equipment			200,000	200,000	200,000	200,000	800,000
A13201	Furniture & Fixture			50,000	50,000	50,000	50,000	200,000
A13701	Hardware			30,000	30,000	30,000	30,000	120,000
A13702	Software			10,000	10,000	10,000	10,000	40,000
A13703	I.T Equipment			60,000	60,000	60,000	60,000	240,000
	Total:-			1,350,000	1,350,000	1,350,000	1,350,000	5,400,000
	G.Total:-			4,040,000	4,040,000	4,040,000	4,040,000	16,160,000

Command Area Development of Jalalpur Irrigation Project (CADJIP)
Project Supervision and Management Cost

D. Director Agriculture (OFWM)/ Deputy Director Agriculture (OFWM)/ Assistant Director Agriculture (OFWM)

Object Code	Particulars	Year-I (2019-2020)	Year-II (2020-21)	Year-III (2021-22)	Year-IV (2022-23)	Total
A03	Operating Expenses					
A032	Communication					
A03201	Postage & Telegraph	20,000	20,000	20,000	20,000	80,000
A03202	Telephone & T/Calls	200,000	200,000	200,000	200,000	800,000
A03204	Electronic Communication	80,000	80,000	80,000	80,000	320,000
	Total:	300,000	300,000	300,000	300,000	1,200,000
A033	Utilities					
A03303	Electricity	200,000	200,000	200,000	200,000	800,000
A03304	Hot & Cold Charges	80,000	80,000	80,000	80,000	320,000
	Total:-	280,000	280,000	280,000	280,000	1,120,000
A034	Occupancy Costs					
A03406	Rent for office buildings	360,000	360,000	360,000	360,000	1,440,000
A03407	Rate & Taxes	10,000	10,000	10,000	10,000	40,000
	Total:-	370,000	370,000	370,000	370,000	1,480,000
A038	Travel & Transportation					
A03805	Traveling Allowance	4,000,000	4,000,000	4,000,000	4,000,000	16,000,000
A03807	P.O.L. Charges	1,200,000	1,200,000	1,200,000	1,200,000	4,800,000
	Total:-	5,200,000	5,200,000	5,200,000	5,200,000	20,800,000
A039	General					
A03901	Office Stationery	100,000	100,000	100,000	100,000	400,000
A03902	Printing & Publication	60,000	60,000	60,000	60,000	240,000
A03905	News Papers & Periodical Books	20,000	20,000	20,000	20,000	80,000
A03907	Advertising & Publicity Charges	100,000	100,000	100,000	100,000	400,000
A03970	Other	400,000	400,000	400,000	400,000	1,600,000
	Total General:-	680,000	680,000	680,000	680,000	2,720,000
	Total Operating Expenses:-	6,830,000	6,830,000	6,830,000	6,830,000	27,320,000
A13	Repair & Maintenance of Durable Goods					
A13001	Transport	600,000	600,000	600,000	600,000	2,400,000
A13101	Macinery & Equipment	60,000	60,000	60,000	60,000	240,000
A13201	Furniture & Fixture	40,000	40,000	40,000	40,000	160,000
A13701	Hardware	50,000	50,000	50,000	50,000	200,000
A13702	Software	30,000	30,000	30,000	30,000	120,000
A13703	I.T Equipment	100,000	100,000	100,000	100,000	400,000
	Total:-	880,000	880,000	880,000	880,000	3,520,000
	G.Total:-	7,710,000	7,710,000	7,710,000	7,710,000	30,840,000

Command Area Development of Jalalpur Irrigation Project (CADJIP)
Summary of Operational and Administrative Expenses

Object Code	Particulars	Year-I (2019-2020)	Year-II (2020-21)	Year-III (2021-22)	Year-IV (2022-23)	Total
A01101	Basic Pay of Officers	9,386,000	9,617,000	9,848,000	10,079,000	38,930,000
A01151	Basic Pay of other Staff	9,951,000	10,381,000	10,812,000	11,240,000	42,384,000
A012-1	Regular Allowance	11,516,000	11,649,000	11,779,000	11,911,000	46,855,000
A012-2	Other Allowances Exl. T.A	5,000,000	5,000,000	5,000,000	5,000,000	20,000,000
	Total Employee Related Expenses	35,853,000	36,647,000	37,439,000	38,230,000	148,169,000
A03	Operating Expenses	9,520,000	9,520,000	9,520,000	9,520,000	38,080,000
A13	Repair & Maintenance of Durable Goods	2,230,000	2,230,000	2,230,000	2,230,000	8,920,000
	G-TOTAL	47,603,000	48,397,000	49,189,000	49,980,000	195,169,000

Command Area Development of Jalalpur Irrigation Project (CAD-JIP)**Object-Wise Details of Project Costs**

Object Code	Particulars	Yearly Phasing				
		Year-I (2019-20)	Year-II (2020-21)	Year-III (2021-22)	Year-IV (2022-23)	Total
A051	Subsidies					
A05120	Others					
	Subsidy for watercourse construction and lining	22.416	470.738	896.645	784.564	2,174.363
	Subsidy for LASER Land Leveling	9.600	33.600	57.600	43.200	144.000
	Subsidy for HEIS	14.000	70.000	112.000	84.000	280.000
	Subsidy for water storage pond and solar powered pumping station	-	5.600	22.400	28.000	56.000
	Total	46.016	579.938	1,088.645	939.764	2,654.363
	Supervision and Administration Cost					
A01	Employees Related Expenditures	35.853	36.647	37.439	38.230	148.169
A03	Operating Expenses	9.520	9.520	9.520	9.520	38.080
A13	Repair & Maintenance of Durable Goods	2.230	2.230	2.230	2.230	8.920
	Total	47.603	48.397	49.189	49.980	195.169
	Transport, Machinery and Equipment					
A09203	IT Equipment	-	2.275	-	-	2.275
A09501	Transport	-	24.500	-	-	24.500
A09601	Plant & Machinery	-	5.250	-	-	5.250
A09701	Furniture & Fixture	-	1.000	-	-	1.000
	Total		33.025	-	-	33.025
A064	Transfer Payments					
A06470	Others					
	CAD Consultancy Services	53.244	60.900	60.900	60.900	235.944
	Awareness Creation, Training, Capacity Development, Demonstration, Extension and Private Agriculture Support Services (PASS)	30.220	37.200	54.700	57.580	179.700
	Price Escalation/ Contingencies (@3% of civil works)	-	20.960	39.324	33.928	94.211
	Total	83.464	119.060	154.92	152.41	509.855

**ELIGIBILITY CRITERIA FOR RECRUITMENT OF PROCUREMENT SPECIALIST
(LUMP SUM PAY PACKAGE)**

Name of the post	Qualification/Experience/ Job Description	Age Limit	Pay Package
Procurement Specialist	<p>Master degree in Project Management, Law & Finance/ Economics/Commerce/ MBA or equivalent from HEC recognized University with at least five (05) years' post qualification experience of Procurement Management, Planning, Implementation & monitoring of large projects of which at least two (02) years of working should be on procurement preferably under the donor funded projects using donor's guide lines.</p> <p>He will prepare forms and contract documents (advertisements/ EOIs, bidding documents, bid opening, evaluation formats, letters of awards, draft contracts etc.) as well as procurement plan in accordance with the relevant ADB Guidelines and other procurement Rules/ Guidelines/ Policy of the Punjab Government. He will provide support in getting the No Objection Letters (NOLs) from the ADB, wherever required. He will ensure that the procurement under the project is being carried out in accordance with the approved procedures vis-à-vis procurement plan agreed with the ADB. He will prepare/ update procurement related progress reports and record as and when required by the World Bank and the government and make availability of records of all procurement for internal and external Audit as well as pre/post review of the World Bank.</p>	30-45 years	Rs.200,000/- per month

CRITERIA FOR RECRUITMENT

Marks

(i) **Where prescribed minimum qualification is Master's degree/equivalent** **70**

		Ist Div	2 nd Div	3 rd Div
1.	Master - 50%	35	32	21
2.	Bachelor - 25%	17	16	11
3.	Intermediate - 17%	12	11	7
4.	Matric - 08%	6	5	3

(ii) **Hafiz-e-Quran/Ex-Servicemen** **05**

(iii) **Experience in the relevant field (other than prescribed experience)** **10**

1.	5 years	10
2.	3 years	07
3.	2 years	05

(iv) **Interview** **15**

**ELIGIBILITY CRITERIA FOR RECRUITMENT OF CONTRACT MANAGEMENT
SPECIALIST (LUMP SUM PAY PACKAGE)**

Sr. No.	Name of the post	No. of post(s)	Qualification/Experience	Age Limit	Pay Package
1)	Contract Management Specialist	01	Graduate Degree in Law (16 years education) from an accredited College or University with at least five (05) years' post qualification experience of Contract Management. He will be responsible for management of all types of contracts to be made under the project and will assist the project management in drafting and approval of contracts with different stakeholders.	30-45 years	Rs. 200,000/- per month.

CRITERIA FOR RECRUITMENT

- (i) **Where prescribed minimum qualification is Bachelor's degree** **Marks**
60

	1 st Division	2 nd Division	3 rd Division
Bachelor 50%	30	25	21
Intermediate 33%	20	16	14
Matric 17%	10	09	07

- (ii) **Higher Qualification in the relevant field.** **10**

Next above the qualification prescribed under the rules.

One stage higher	05
Two stages higher	07
Three stages higher	10

- (iii) **Additional Experience in Relevant Field** **10**

One year	05
Two years	07
Three years	10

- (iv) **Hafiz-e-Quran/Ex-Serviceman** **05**

- (v) **Interview** **15**

**ELIGIBILITY CRITERIA FOR RECRUITMENT OF DEPUTY DIRECTOR
AGRICULTURE (OFWM)/LIAISON OFFICER (BS-18+SP)**

Name of the Post	Qualification/Experience	Age Limit	BS
Deputy Director Agriculture (OFWM)/Liaison Officer	B.Sc. Agri. Engg. OR B.Sc. (Hons.) Agri. with 5 years' experience in the field of Water Management. He will act as a Liaison Officer between Irrigation and Agriculture departments and coordinate all project activities. He will provide support in smooth execution of project activities and resolution of issues encountered during project execution.	25-35 Years	18+SP

CRITERIA FOR RECRUITMENT

- (i) **Where prescribed minimum qualification is Bachelor's degree** **Marks**

60

	1 st Division	2 nd Division	3 rd Division
Bachelor 50%	30	25	21
Intermediate 33%	20	16	14
Matric 17%	10	09	07

- (ii) **Higher Qualification in the relevant field.** **10**

Next above the qualification prescribed under the rules.

One stage higher	05
Two stages higher	07
Three stages higher	10

- (iii) **Additional Experience in Relevant Field** **10**

One year	05
Two years	07
Three years	10

- (iv) **Hafiz-e-Quran/Ex-Serviceman** **05**

- (v) **Interview** **15**

**ELIGIBILITY CRITERIA FOR RECRUITMENT OF ASSISTANT DIRECTOR
(TECHNICAL) (BS-18)**

Name of the Post	Qualification/Experience	Age Limit	BS
Assistant Director (Technical)	B.Sc. Agriculture Engineering (Second Division) from a recognized University; and Five years' experience in the field of Water Management. He will assist the project management/ DGA (WM) Punjab in technical matters, carryout field visits, collect, compile and analyze all types of reports, data and information for its presentation to the DGA (WM)/ higher-ups. He will prepared physical and financial plans and help in executing the same and perform other duties as assigned by DGA (WM)/ higher management.	26-35 Years	18

CRITERIA FOR RECRUITMENT

- (i) **Where prescribed minimum qualification is Bachelor's degree** **Marks**
60

	1 st Division	2 nd Division	3 rd Division
Bachelor 50%	30	25	21
Intermediate 33%	20	16	14
Matric 17%	10	09	07

- (ii) **Higher Qualification in the relevant field.** **10**

Next above the qualification prescribed under the rules.

One stage higher	05
Two stages higher	07
Three stages higher	10

- (iii) **Additional Experience in Relevant Field** **10**

One year	05
Two years	07
Three years	10

- (iv) **Hafiz-e-Quran/Ex-Serviceman** **05**

- (v) **Interview** **15**

ELIGIBILITY CRITERIA FOR RECRUITMENT OF WATER MANAGEMENT OFFICER (BS-17)

Name of the Post	Qualification/Experience	Age Limit	BS
Water Management Officer	B.Sc. Agri. Engineering OR B.Sc. (Hons) Agriculture acquired after completion of 4 years post intermediate course of studies. He will supervise the development works in the field including watercourse improvement, LASER land leveling, HEIS etc. He will conduct meetings with the farmers and mobilize/ help them in execution of project activities. He will responsible for maintenance of files/ record of all project interventions in the office and perform other official duties as and when assigned by his supervisory officer.	21-30 Years	17

CRITERIA FOR RECRUITMENT

(i) **Where prescribed minimum qualification is Bachelor's** **Marks**

60

	1 st Division	2 nd Division	3 rd Division
Bachelor 50%	30	25	21
Intermediate 33%	20	16	14
Matric 17%	10	09	07

(ii) **Higher Qualification in the relevant field.** **10**

Next above the qualification prescribed under the rules.

One stage higher	05
Two stages higher	07
Three stages higher	10

(iii) **Additional Experience in Relevant Field** **10**

One year	05
Two years	07
Three years	10

(iv) **Hafiz-e-Quran/Ex-Serviceman** **05**

(v) **Interview** **15**

ELIGIBILITY CRITERIA FOR RECRUITMENT OF ACCOUNTANT (BS-16)

Name of the Post	Qualification/Experience	Age Limit	BS
Accountant	Bachelor degree in Commerce (B.Com) with 2 nd division and two years' experience in the field of Accounts. Preference will be given to candidates worked in foreign funded project. He will establish and maintain project records, work with external auditors, prepare annual budgets and prepare expenditure records, help DGA (WM)/ Director (Headquarters) in accounts matters, dealing with expenditure, reconciled statements etc., assist in preparing and maintaining all financial records, purchase of consumable items, furniture/fixture and its maintenance, processing of utility bills (telephone, gas, electricity, water etc.) for the approval of competent authority and follow up with the concerned offices. for account related matters and perform any other assignment assigned by the higher authorities.	21-35 Years	16

CRITERIA FOR RECRUITMENT

(i) Where prescribed minimum qualification is Bachelor's Marks

60

	1 st Division	2 nd Division	3 rd Division
Bachelor 50%	30	25	21
Intermediate 33%	20	16	14
Matric 17%	10	09	07

(ii) Higher Qualification in the relevant field **10**

Next above the qualification prescribed under the rules.

One stage higher	05
Two stages higher	07
Three stages higher	10

(iii) Additional Experience in Relevant Field **10**

One year	05
Two years	07
Three years	10

(iv) Hafiz-e-Quran/Ex-Serviceman **05**

(v) Interview **15**

ELIGIBILITY CRITERIA FOR RECRUITMENT OF COMPUTER OPERATOR (BS-11)

Name of the Post	Qualification/Experience	Age Limit	BS
Computer Operator	Graduate (2nd Division) and 4 months Training in computer language subject to qualifying computer aptitude test. He will be responsible to computerize the data, information and letter etc. and develop format of reports as desired by the government.	18-25 Years	11

CRITERIA FOR RECRUITMENT

(i) **Where prescribed minimum qualification is Bachelor's** **Marks**

60

	1 st Division	2 nd Division	3 rd Division
Bachelor 50%	30	25	21
Intermediate 33%	20	16	14
Matric 17%	10	09	07

(ii) **Higher Qualification in the relevant field.** **10**

Next above the qualification prescribed under the rules.

One stage higher	05
Two stages higher	07
Three stages higher	10

(iii) **Additional Experience in Relevant Field** **10**

One year	05
Two years	07
Three years	10

(iv) **Hafiz-e-Quran/Ex-Serviceman** **05**

(v) **Interview** **15**

ELIGIBILITY CRITERIA FOR RECRUITMENT OF WATER MANAGEMENT SUPERVISOR (BS-11)

Name of the Post	Qualification/Experience	Age Limit	BS
Water Management Supervisor	Matric with 3 years Diploma in Agriculture Engineering, Mechanical Engineering or Auto and Farm Machinery or Civil Engineering from a recognized Institute of government or from a Board of Technical Education, Punjab. He will be responsible for social mobilization of the farming community/ water users associations for watercourse improvement/ development/ construction, LASER land levelling, HEIS and other project activities. He will survey, design and supervise the improvement of community watercourses through water users associations and other project activities. He will also perform other official duties as assigned by his officer.	20-26 Years	11

CRITERIA FOR RECRUITMENT

- (i) **Where prescribed minimum qualification is Intermediate/Equivalent** **Marks**
60

	A+ Grade	A Grade	B Grade	C Grade	D Grade	E Grade
Intermediate 67%	40	38	35	30	25	20
Matric 33%	20	17	15	13	11	10

- (ii) **Higher Qualification in the relevant field** **10**

Next above the qualification prescribed under the rules.

One stage higher	05
Two stages higher	07
Three stages higher	10

- (iii) **Additional Experience in Relevant Field** **10**

One year	05
Two years	07
Three years	10

- (iv) **Hafiz-e-Quran/Ex-Serviceman** **05**

- (v) **Interview** **15**

**ELIGIBILITY CRITERIA FOR RECRUITMENT OF DRIVER (BS-04), RODMAN
(BS-01) AND NAIB QASID (BS-01)**

Sr. No.	Name of the Post	Qualification/Experience	Age Limit	BS
1)	Driver	Literate with 5 years driving experience and having a driving license. He will be responsible to drive the Government vehicle and be responsible for maintenance of vehicle and log book.	26-35 Years	04
2)	Rodman	Literate, Rodman will assist the Water Management Supervisor in carrying out field activities including survey of watercourses and will keep close liaison with the water users association/ farming community for implementation of project activities.	18-25 Years	01
3)	Naib Qasid	Should be literate, he will be responsible for watch & ward of office building.	18-25 Years	01

CRITERIA FOR RECRUITMENT

(i) **Where prescribed minimum qualification is Literate** **Marks**

65

Literate	45
Primary	50
Middle	60
Matric	65

(ii) **Additional Experience in Relevant Field** **10**

One year	05
Two years	07
Three years	10

(iii) **Hafiz-e-Quran/Ex-Serviceman** **05**

(iv) **Interview** **20**

**COMMAND AREA DEVELOPMENT OF JALALPUR IRRIGATION PROJECT
(CAD-JIP)**

PROPOSED INSTITUTIONAL ARRANGEMENTS

