PC - I FORM (Revised 2005)

PRODUCTION SECTORS
(Agriculture Production)

LINING OF WATERCOURSES CHAK NO. 469/GB, SAMUNDRI, DISTRICT FAISALABAD

(ADP Funded)

Govt. Share:	**Rs. 25.000 Million**
Farmers' Contribution:	**Rs. 9.904 Million**
Project Cost:	**Rs. 34.904 Million**

(2015-16)

DIRECTORATE GENERAL AGRICULTURE
(WATER MANAGEMENT) PUNJAB, LAHORE

July, 2015

1. NAME OF THE PROJECT

Lining of Watercourses Chak No. 469/GB, Samundri, District Faisalabad

2. LOCATION

Chak No. 469/GB, tehsil Samundri, district Faisalabad

3. AUTHORITIES RESPONSIBLE FOR

a) Sponsoring

Agriculture Department through Annual Development Program (ADP)

b) Execution

i) Punjab Agriculture Department through Directorate General Agriculture (Water Management) Punjab, Lahore

ii) District Government Faisalabad through District Officer (OFWM), Faisalabad

iii) Water Users Associations (WUAs)

c) Monitoring

i) Directorate General Agriculture (Water Management) Punjab, Lahore

ii) Project Consultants

d) Operation and Maintenance

Water Users Associations (WUAs)

e) Concerned Federal Ministry

Not Applicable

4. PLAN PROVISION

a) If the project is included in the current Five-Year Plan, specify actual allocation

The proposed project is in line with the agriculture sectoral plan and has strong relationship with the Medium Term Development Framework (MTDF) of the Planning and Development Department, Government of the Punjab, which envisages "*Efficient Water Conveyance and Application through Improved Watercourses"* as one of objectives/policy of the agriculture sector. An allocation of Rs. 25.000 million has been made in the Annual Development Program (ADP) 2015-16 for the proposed project.

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 AND ITS RELATIONSHIP WITH SECTOR OBJECTIVES

a) Project Objectives

The goal of the proposed intervention is to enhance conveyance efficiency, which in turn would result in saving of water and improvement in water productivity for the growers in Chak No. 469/GB tehsil Samundri, district Faisalabad with following key objectives.

i. Enhance efficiency of tertiary level irrigation conveyance network (community watercourses) for increasing water availability at the farm level.

ii. Support the rural communities of the village to increase their farm returns by utilizing the available resources more efficiently to alleviate poverty.

b) Sectoral Relationship

The proposed project has a strong relationship with the objectives and growth policy of the agriculture sector. Increasing efficiency/productivity, especially at the farm level is one of key objectives of sectoral plan. The proposed intervention aims at enhancing water conveyance efficiency at the farm level through watercourse improvement/extension of lining on already improved watercourses in the model village.

6. DESCRIPTION OF THE PROJECT

a) Background of the Project Area

Samundri is an administrative subdivision (tehsil) of Faisalabad district in the Punjab province. The lands of Tehsil Samundri are irrigated by Gogera and Burala branch canals. Land of Chak No. 469/GB are being irrigated by Gogera branch canal. Sugarcane is the major cash crop of the area while wheat, cotton and vegetables are also grown on the fertile lands of the tehsil. The Chak No. 469/GB has been got declared a model village by the Naval Chief and different development schemes including lining of watercourses have been approved by the Chief Minister, Punjab for model village.

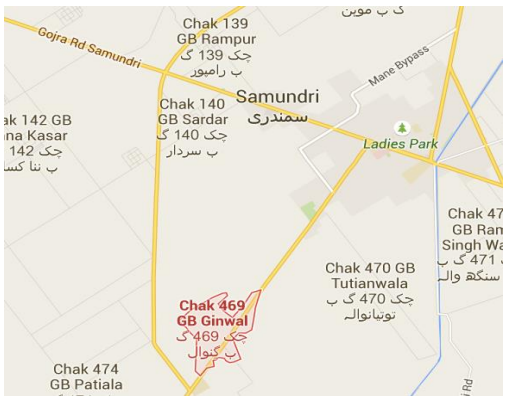

Figure-1: Google Images of Chak No. 469/GB tehsil Samundri, district Faisalabad

b) Watercourse Improvement

Tertiary level irrigation system in the Punjab comprises of about 59,000 watercourses. Improvement of about 47,000 canal area watercourses have been improved so far and remaining un-improved canal watercourses are being improved under the Punjab Irrigated-Agriculture Productivity Improvement Project (PIPIP) and other OFWM future projects. The main sources of water losses are seepage, spillage, and side leakage from the watercourses, resulting from following factors.

- Irregular profile and zigzag alignment of banks, with many points of weakness
- Variable cross section of water channels
- Silt deposition, causing restrictions in flows, and overtopping
- Trees, shrubs, and vegetation growing in watercourses
- Damage caused by rodents and farm animals
- Frequent bank cutting and plugging for water abstraction

The watercourse improvement is one of the most popular intervention among the farming community with several tangible and intangible benefits. It is also the most studied and researched intervention amongst all OFWM activities. Its numerous evaluation and impact assessment studies have been carried out by various national and international organizations/institutions. Their findings have indicated huge benefits accruing from an improved watercourse including saving of about 119 acre feet of water per annum. The glimpses of unimproved vis-à-vis improved watercourses are shown in **Figure-2 & 3.**

Figure-2: Unimproved Watercourses

Figure-3: Improved Watercourses

The salient features of watercourse improvement impact sare summarized hereunder in **Table-1**.

Table-1: Impact of Watercourse Improvement

Sr. No.	Impact	Extent
1	Annual water saving (acre feet)	119
2	Improvement in crop yields (%)	2-15
3	Increase in cropping intensity (%)	4
4	Saving in irrigation time (%)	28
5	Expansion in irrigated area (%)	21
6	Reduction in labor for irrigation (%)	50
7	Enhancement in farm incomes (%)	15
8	Decrease in conveyance losses (%)	39
9	Curtailment in saline area (%)	87
10	ERR (%)	28.1
11	C:B ratio	1: 2.3

6. PROJECT COMPONENTS

The major activities to be carried out under the proposed project would include, inter alia, the followings.

A. R e-activation of three (3) Water Users Associations already registered under On Farm Water Management and Water Users Association Ordinance [Act], 1981(Amended 2001) in Chak No. 469/GB tehsil Samundri, district Faisalabad.

B. I mprovement of three (3) watercourses/extension of lining on already improved watercourses in Chak No. 469/GB tehsil Samundri, district Faisalabad.

6-A. Re-activation of Water Users Associations (WUAs)

The proposed works will be carried out through reactivation of already organized/registered Water Users Associations (WUAs) that would be performing following key responsibilities.

a) Provide right of way for constructing watercourse
b) Arrange skilled and unskilled labour required for reconstruction/ maintenance of earthen water channel, installation of water control structures, and lining of critical reaches
c) Procure construction materials for carrying out civil works
d) Settle matters of disputes amongst the water users in respect of channel alignment, fixation of nakkas, distribution of work etc.
e) Make alternate arrangements for conveyance of water during execution of improvement works

f) Carry out civil works in accordance with standards and specifications under the supervision of OFWM field staff
g) Regularly undertake O&M of improved watercourses

6-B. Improvement of Watercourses/Extension of Lining

The watercourse improvement / renovation consists of complete demolishing of community channel and its rebuilding/re-aligning according to the engineering design to increase conveyance efficiency by reducing seepage, evaporation, and operational losses. The approved procedure for watercourse improvement/extension of lining as adopted under proposed "Optimizing Watercourse Conveyance Efficiency Through Enhancing Lining Length" project will be followed under this project.

Three (3) watercourses of Chak 469/GB of tehsil Samundri, district Faisalabad will be improved under the proposed project. The basic data of these three watercourses is given as under.

Sr. No.	WC No.	Total Length (m)	Command Area (acres)	Sanctioned Discharge (lps)	Designed Discharge (lps)	Already Lined (m)	Proposed Lining Works (m)
1	14260/R	6,600	600	50	80	1,050	5,550
2	12505/R	6,500	580	46	76	740	5,760
3	20724/R	7,260	610	55	85	2,891	4,369

It is planned that the allocated funds would be used for proposed works on each watercourse under the proposed project (**Annexure-A**).

The existing cost sharing arrangements are well accepted and adopted by the farming community whereby, government provides entire cost of construction materials (lining and structures) while the farmers are required to contribute entire labour costs (cash and kind) for improvement of the watercourses. It is, therefore, planned that the same cost sharing mechanism will be followed for undertaking envisaged works under the proposed project.

7. IMPLEMENTATION ARRANGEMENTS

The 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. District Office (OFWM), Faisalabad would be responsible for supervision, coordination and internal monitoring at district level. The field activities will be executed by the WUAs and supervised by the Deputy District Officers (OFWM), Samundri. Internal monitoring of

project activities would be responsibility of DO (OFWM), Faisalabad. The external monitoring & evaluation of project activities would be undertaken by the project consultants. It is planned that Project Implementation Supervision Consultants (PISCs) of Punjab Irrigated-Agriculture Productivity Improvement Project (PIPIP) would be engaged for providing requisite consultancy services under the proposed project.

8. MATERIALS, SUPPLIES AND EQUIPMENT REQUIREMENT

It is envisaged to utilize the existing facilities and infrastructure for implementation of the scheme.

9. CAPITAL COST ESTIMATES

a) Indicate date of estimation of project cost estimates

The cost estimates of the project have been prepared during June 2015.

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

The cost of the project has been calculated based on market rates. The unit cost of watercourses to be improved is attached (**Annexure-B**).

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

The year-wise/component-wise phasing of physical targets/activities of the project is appended (**Annexure-C**).

d) Year-wise/Component-wise Financial Requirements

The year-wise/component-wise phasing of financial requirements for project activities is provided (**Annexure-C**).

10. ANNUAL OPERATING AND MAINTENANCE COST AFTER COMPLETION OF PROJECT

It is envisaged that the farmers/WUAs would be responsible for the operation and maintenance of improved watercourses. As such, there would be no recurring expenditure for activities completed under the proposed project.

11. DEMAND AND SUPPLY ANALYSIS

The proposed project envisages improvements in canal water supplies to the farms through improvement of watercourses at Chak 469/GB of tehsil Samundri, District Faisalabad. It will enhance conveyance efficiency resulting in saving of precious irrigation water, which will in turn improve the water availability at the farm level to enhance crop productivity.

12. 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	-	-
Grant	-	-
Technical Assistance	-	-
Federal Government	-	-
Grant	-	-
Loan	-	-
Investment	-	-
Direct Expenditure	-	-
Provincial Government	*25.000*	-
Grant	-	-
Loan	-	-
Investment	-	-
Direct Expenditure	-	-
Sponsoring Agency's own fund	-	-
Private Investment (SSCs)	-	-
Local Body Resources, if any		
Non-Government borrowing	-	-
Beneficiaries Contribution	*9.904*	-
Other sources (e.g. Recoveries)	-	-

d) Weighted Cost of Capital

NA

e) Flow of Funds

The allocated funds will be transferred from Account No. 1 (Non-Food) of the Provincial Government into Account-IV of the District Government, Faisalabad through Finance Department.

13. 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. It is estimated that 100 percent extension of watercourse lining would result in significant saving of water per watercourse per annum.

b) E

conomic Returns

The watercourse improvement is technically feasible, socially acceptable, and economically viable intervention. The watercourse improvement has very high economic

rate of return (ERR) i.e. upto 32 percent as calculated under Punjab Irrigated-Agriculture Productivity Improvement Project (PIPIP).

c) Social Benefits

Irrigation water saved through reduced conveyance losses in the improved/rehabilitated watercourses would increase the cropped area, crop yields, cropping intensity and farm incomes in the project area. Accordingly, increased income levels of the farming community will improve livelihood in the rural areas. Lessening the drudgery of irrigation operation to a great extent, shift to high delta crops, reduction in water theft and related litigation among farmers, increase in farm income etc. would result in social uplift of rural population of Chak 469/GB of tehsil Samundri, district Faisalabad.

d) Environmental Benefits

The project builds on existing infrastructure and improves system operations. It would, thus, not experience adverse environmental affects normally associated with new developments, such as resettlement, depletion of land and water resources, and loss of wildlife habitat. In addition to reducing the problems of waterlogging and salinity, improved water management would reduce incidence of mosquito-borne diseases by reducing the habitat of mosquitoes with reduction in stagnant water leaking from deteriorated water channels.

e) Employment Generation

Implementation of the project would generate skilled and unskilled labor in the project area.

f) Impact of Delays on Project Cost/Viability

Delay in implementation of proposed interventions may result in more water losses in these watercourses besides increase in watercourse improvement/lining cost due to price hike in the cost of construction materials.

14. IMPLEMENTATION SCHEDULE (INCLUDING STARTING AND COMPLETION DATES)

Indicate starting and completion date of the project:-

Starting Date	Completion Date
July 2015	June 2016

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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Annexure-A

Lining of Watercourses Chak No. 469/GB, Samundri, District Faisalabad

Watercourse Lining Length

Watercourse No.	Total Length of Watercourse (m)	Existing Lining Length (m)	Proposed Lining Length (m)	Total Lining Length (m)
14260/R	6,600	1,050	5,550	6,600
12505/R	6,500	740	5,760	6,500
20724/R	7,260	2,891	4,369	7,260
Average	***6,787***	***1,560***	***5,226***	***6,787***

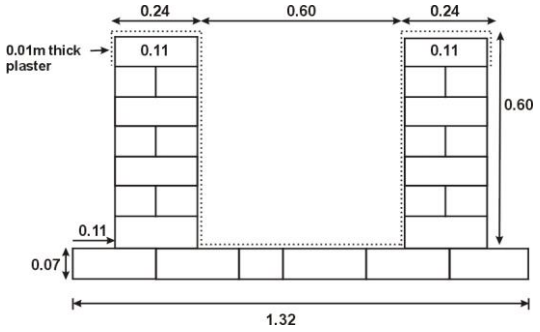
Annexure-B

Lining of Watercourses Chak No. 469/GB, Samundri, District Faisalabad
Estimated Break-up of Unit Cost (Brick Lined Watercourse)

1. Cross Section of a Typical Watercourse

Lined Section Dimensions

Depth = 60 cm (24 inches)
Bottom Width = 60 cm (24 inches)
Floor Thickness = 7 cm (2.75 inches)
Floor Width = 132 cm (52 inches)
Wall Thickness = 23 cm (9 inches)



2. Basic Data of a Typical Watercourse to be Lined

Items	Unit	Qty	Unit Volume (m^3)	Total Volume (m^3)
Length of Watercourse	m	6,787		
Design Discharge	lps	80		
Average Slope	m/m	0.0004		
Length of Lining upto 100 % (excluding already lined portion)	m	5,226	0.3684	1925.38
Nakka Structures (0.51 m dia)	No.	50	0.52	26.00
Culvert	No.	5	5.00	25.00
Sign Board	No.	1	0.50	0.50
Drop Structure	No.	5	0.25	1.25
Animal Wallow	No.		15.00	0.00
				1,978

3. Estimated Materials & Cost

Items	Unit	Qty.	Unit Cost (Rs.)	Total Cost (Rs.)
Bricks (500 Bricks per cubic meter)	No.	989,066	6,000 /1000	5,934,394
Cement (1.87 bags per cubic meter with Cement Sand Ratio 1:4)	bag	3,699	535 /bag	1,977,172
Sand (0.26 cubic meter per cubic meter)	m^3	514	730 /m^3	375,424
Nakkas	No.	50	930 /Nakka	46,500
Total Material Cost				**8,333,489**
Material Cost per Running Meter (Rs.)				**1,595**

4. Cost of Labour & Masons

Items	Labor (Rs.)	Masons (Rs.)	Total (Rs.)
Alternate irrigation channel for construction of 5,226 meters lined section (0.2 men-days/meter @ Rs. 450/man-day)	470,370		470,370
Excavation /pad work/backfilling of section to be lined 5,226 meters (0.2 men-days/meter @ Rs.450/man-day)	470,370		470,370
Construction of lined section 5,226 meters @ Rs. 400/meter	1,045,267	1,045,267	2,090,533
Installation of 50 nakkas @ Rs. 900/- each	22,500	22,500	45,000
Construction of 5 culverts @ Rs. 9,000/- each	22,500	22,500	45,000
Construction of 05 drop structures @ Rs. 1,000/- each	2,500	2,500	5,000
Construction, painting and writing of sign board @ Rs. 3,500/- each	1,750	1,750	3,500
Repair of already lined section			171,558
Total Labor & Masons	**2,035,257**	**1,094,517**	**3,301,332**

5. Overall Unit Cost of Watercourse Improvement

Items	%	Amount (Rs.)
Cost of materials	75	8,333,489
Cost of labor for civil works	14	1,564,887
Cost of masons	10	1,094,517
Cost of repair and maintenance	2	171,558
Total	**100**	**11,164,451**
Government Share	72%	8,333,489
Farmers' Contribution	28%	3,301,332
Total	**100%**	**11,634,821**

Annexure-C

Lining of Watercourses Chak No. 469/GB, Samundri, District Faisalabad

Physical Targets and Financial Outlay

Sr. No.	Particulars	Units	2015-16
I.	**Physical Activities**		
A.	Re-Activation of Water Users Associations	Nos.	3
B.	Improvement of Watercourses/Extension of Lining	Nos.	3
II.	**Fianancial Outlay (Rs. Million)**		
B.	Improvement of Watercourses/Extension of Lining		
	a. Government Share	8.33	25.000
	b. Farmers' Contribution	3.30	9.904
	Total Project Cost		**34.904**