GOVERNMENT OF THE PUNJAB
PLANNING AND DEVELOPMENT BOARD
(IRRIGATION SECTOR)

Date of receipt of PC-II in P&D Board: 11.02.2025

WORKING PAPER FOR PDWP
PART-A

PROJECT PROFILE:

1.	**Project Title**	Feasibility Study for Integrated Management of Hill Torrents of Khushab and Mianwali
2.	**Location**	District Khushab & Mainwali
3.	**Sponsoring Agency**	Irrigation Department
4.	**Executing Agency**	Irrigation Department
5.	**Maintenance & Operation**	Irrigation Department
6.	**Name Of Relevant Department(S) /Stakeholder(S) Invited In Pre-PDWP**	• Irrigation Department • Technical Advisor Finance Department • Director PERI • CEO Urban unit
7.	**Name Of Sector's Specialist / Consultant / Advisor Expert Invited In [Pre-PDWP**	• Irrigation Department • Technical Advisor Finance Department • Director PERI • CEO Urban unit • Sr. Chief (Consultancy), P&D Board • Chief (Technical), P&D Board • Consultant (ID), P&D Board
8.	**Cost of PC-II**	Rs. 138.878 Million
9.	**Source of Financing**	Provincial ADP at G.S. No. 2446
10.	**Allocation 2024-25**	Rs. 1.000 Million
11.	**Implementation Period**	18 Months

12. Project Description:

District Khushab

District Khushab consists of four tehsils i.e. Khushab, Noorpur, Quaidabad and Naushehra. Tehsil Quaidabad and Khushab are located parallel to the salt range hill series. During heavy rainfall on salt range in District Khushab, hill torrent emerge from mountains and hit the infrastructures in both these tehsils. Mohajir Branch Canal having 61.50 Km length has been constructed parallel to salt range with an average distance of 10 Km, works as a first line of defense against hill torrents. 41 No. Syphons have been provided under Mohajir Branch Canal for crossing hill torrent water, but in case of exceptionally high torrential flood, water over tops the Mohajir Branch and damages the abadies, houses, constructions, infrastructure & crops etc. in tehsil Quaidabad & Khushab. Further, the routes of these hill torrents after passing

through Syphons are badly disturbed by the local inhabitants and not linked with any drain. Hill torrent flood is a natural disaster and a major problem of district Khushab. Out of many hill torrents emanating from Salt Rang, 13 No. are identified as major hill torrents i.e. Chidru, Golewali, Rukhla, Warcha, Choha, Chussu, Dhokari, Jabbi, Pherra, Kund, Khaliqabad, Waheer and Nali having 554.88 sq km and accumulative discharge of 80600 Cs (as per assessment of flood discharge of 40 years). Hill torrent of Katha which is passing from village Narri directly hits Dhak Drain and by damaging both the bank of said drain crosses the ditch channel i.e. Dhak Disty, also requires proper solution. Further, the drainage problem of ample quantity of seepage and standing rainwater in the areas of Ghagh, Sandral, Namaywali & Jandran etc. needs to be resolved, from which many acres of agricultural land will be reclaimed. Another major issue is Shiwala Nullah, which is a natural route for passing torrential flood water from the Khushab city and became very narrow because of urban encroachments, garbage and sewerage waste causing urban flooding, must be determined. There are 37 Drains for seepage control in the area having 2900 Cs cumulative discharge only, which have been designed on catchment area of 4 Cs per Mile, but not even a single storm water drain is available in district Khushab. From 31.08.2020 to 04.09.2020 heavy rainfall of 1264 MM happened in all tehsils of District Khushab, due to which exceptionally high hill torrents emerged from the salt range mountains and by overtopping various reaches of Mohajir Branch Canal badly damaged the abadies, drains and canal infrastructure etc. There is a great unrest and panic in the torrential flood effected areas. Similar level of destruction was also witnessed in September 2015, due to heavy downpours of 384 mm intensity.

District Mianwali

Tehsil Isakhel of District Mianwali is located in the toe of Salt Range Mountians termed as Sur Ghar Range which surrounds the Isakhel Tehsil from Northeast near Kalabagh city (Right side of Indus River) to Southwest near Dara Tang (Left side of River Kurram). Many hill torrents emanate from this mountain and flow towards River Indus D/S of Jinnah Barrage. These Nullahs have history of aggression and eroded large area of agricultural lands, damaged value able properties and abadies. Several causalities were reported. Many animals also died during that torrential flood. These hill torrents include Chichali, Adwala, Broach, Rakka, Darsola, Mochimar, Sarkia and Nehal Shah having vast catchment area in KPK Province enter premises of Punjab province near toe of these mountains carrying high velocity torrential discharge.

All of these nullahs cross the main Mianwali – Bannu road and don’t have any specific route for safe disposal of torrential water to Indus/Kurram River. So the

water spreads out due to absence of any channelized route damaging the crops, valuable lands, houses and other public properties etc. Adwala and Broach are the most problematic Nullahs having more amount of flow that other Nullah. Catchment of Adwala is sandwiched between Broach and Chichali in form of sub branches which inter-join 2 miles u/s of Mianwali – Bannu Road but on downstream it has no specific route. Water scatter and spread into surrounding fields slowly depositing heavy sediments during each freshet, which causes blockage of water way under the bridge possessing threat to nearby abadies due to its stagnation and breaching of protection bunds upper stream of Bannu Road Bridge. The mighty broach has a very vast catchment area in KPK and enters Punjab near Mallah Khel village. It has a history of aggression and has eroded valuable land, villages, abadies like Sultan Wala, Zatto Khel, Jattan Wala, Murghanwala, Gaggar Khel, etc and crosses Mianwali-Bannu Road near Kamar Mishani in its natural course. On downstream of Mianwali-Bannu Road, Nullah has no defined route and torrential water spreads & forms sheet flow that damages the vast area of fertile land. Severe damages were observed during the prolong rainy spell during 2010 & 2015. Keeping in view the problems, a project "Channelization of Nullah Broach Tehsil Isakhel District Mianwali" was launched. The scheme was based on a Feasibility Study of the Consultants, M/S Associated Consulting Engineers and following protection structures were completed by the contractors.

- Dispersion Structures
- Gabion Wall
- Protection Levee
- Protection Work Jattanwala
- Stone Pitching RD 62+000 to 79+000
- D/S Cunette

During the construction, the people of the area showed great resistance and the work on downstream of Mianwali- Bannu Road couldn't be completed till now. Furthermore, in the feasibility study carried out by M/S Associated Consulting Engineers - ACE (Pvt.) Ltd, the maximum discharge for a return period of 50 years was worked out to be 10,500 cusecs and later revised to 14,000 cusecs while during the flood season of 2022, torrential discharge of 20,000 cusecs generated due to excessive rainfall over the area which severely damaged the structures built on it during the execution of the scheme. It implies that Design Discharge, Sediment Analysis, and a lot of abadies on the bank of nullah were not properly considered and are being badly affected by every torrential flow. Keeping in view all the issues, the department has formed several committees, but they can't suggest any other

alternative but recently assessed that discharge of 20,000 cusecs is not viable to pass safely through proposed alignment. The other nullahs of Isakhel Tehsil are less impactful as compared to these but pore serious threat and several damages occur in each freshet by forming sheet flow and inundating a vast area suspending daily routine and causing shortage of food. To save from this calamity, inhabitants of the area have approached their local parliamentarian's and the Irrigation Department as well, for rehabilitation / upgradation of existing Drainage System/alignment or any other solution etc. which deems fit for protection of urban and agricultural areas.

The Consultants will be engaged to provide solutions for better managements of Hill Torrents in District Mianwali and Khushab. The proposed solutions must be technically, economically, socially and legally viable.

Project Objectives:

- To conduct a fresh feasibility study to provide solutions for better managements of Hill Torrents in District Mianwali and Khushab.
- The proposed solutions must be technically, economically, socially and legally viable. Identification / demarcation of flood plains of hill torrents will also be part of feasibility study as per the Punjab Flood Plains Regulations Act 2016 is also necessary.
- In order to save from this calamity, inhabitants of the area have approached their local parliamentarian's and the Irrigation Department as well, for rehabilitation / up-gradation of existing Drainage System / alignment or any other solution etc. which deems fit for protection of urban and agricultural areas of Mianwali and Khushab Districts. Hence, there is a dire need to hire consultants for carrying out a comprehensive Feasibility Study.
- The study would include detailed Topographic, Hydrologic and Sediment Analysis of the entire catchment area for proper designing of channelized route of Nullah with dukes / studs and all other related structures so that flashy flood water may safely be drained to Indus & Jhelum River. It will primarily focus on the estimation of the rainfall, quantum of resulting discharge through remote sensing techniques, GIS and other modern computer aided modeling and silt content.

12. (a) Sector Issues

- Growing water shortages, which are further worsened in periods of drought.
- The irrigation and drainage infrastructure has deteriorated overtime due to a combination of age, chronic under-funding of maintenance and repair (M&R), and lack of appropriate asset management planning.

- Gaps in meeting financial sustainability of the system owing to low recovery of Abiana, inefficient operational regimes and low M&R funding.
- Lack of participatory approach in operations, maintenance and management of irrigation services leading to inefficiencies, inequities and lack of ownership by users.
- Imprudent and inefficient utilization and management of groundwater.

(b) Sector Strategy

- Implement structural measures for optimal utilization of surface water resources.
- Plan effective utilization of public investments for modernization of irrigation infrastructure.
- Develop and practice holistic approaches to optimize surface and groundwater use efficiencies with the aim to maximize agricultural productivity of irrigated lands.
- Mitigate environmental degradation and groundwater mining.
- Extended broad-based institutional reforms already initiated in the province to achieve improved service delivery targets.
- Extended and improve drainage flood protection, hill torrent management and command area development interventions in riverine and rain-fed (Barani) areas.

13. Relationship of the project with sectoral policy / growth strategy, 2025

14. Alignment with Punjab spatial strategy, 2047(comments of urban unit)

Not received/provided yet

15. Other Major on Going and Potential Projects in the Sector

- Construction of Flood bund from Hairo Flood Bund to Raikh Baghwala Flood Bund on Right side of River Indus (to project head regulator of Kadra Creek and adjoining abadies)
- Flood protection of Kamoki and adjoining areas
- Rehabilitation and up-gradation of Trimmu Barrage, Punjnad Head Works
- Construction of Jalalpur Irrigation project and its System.
- Improvement of Irrigation Water Supply at Tail Reaches of Irrigation Channels of Minors in Selected Area of Punjab.
- Construction of Dadhocha Dam
- Construction of Sorra Dam
- Construction of Ghabir Dam

16. General Abstract of Cost

Sr. No.	Description	PC-II submitted cost before Pre-PDWP	PC-II cost after Pre-PDWP
1.	Remunerations Amount	98,507,200	55,823,144
2.	Direct Cost	56,610,000	14,625,000
3.	Topographic Survey	59,750,000	53,775,000
4.	Sub-Soil Investigations	9,700,000	9,700,000
5.	Publication and Printing of Land Acquisition Documents	6,615,000	1,000,000
	Sub-Total	**231,182,200**	**134,923,144**
	Add 5% PST on item No. 2 to 5	6,633,750	3,955,000
	Grant Total	**237,815,950**	**138,878,144**
	Says Rs. in Million	**237.816**	**138.878**

17**. Unit Cost** N/A

18. **Period of Implementation** 18 Months

19. **Annual Recurring Expenditure** N/A

20**. Annual Income after Completion** N/A

21**. Requirement of vehicle/ staff/consultancy** 2 No. rental vehicles required/proposed

22**. Existing Facility** N/A

Part-B

23. **Technical Appraisal**

The Pre-PDWP meeting of the PC-II was convened on 24-02-2025 under the Chairmanship of Member (Water) P&D Board, Lahore. The comments / observations raised by Irrigation and Consultancy Sectors of P&D Board, replies by sponsoring agency and decisions of Pre-PDWP are juxtaposed as under:

Sr. No	Observations	Departmental Reply	Pre-PDWP Decision
IRRIGATION SECTOR			
1.	The report of the project feasibility study is reflecting that to overcome the problems of devastation and destruction of all Nullahs of Tehsil Isakhel a feasibility study was carried out by the M/s Associated Consulting Engineers ACE (Pvt.) in the year 2015-16 and proposed remedies & measures were executed by the department under some projects. It is strangely observed that these protective measures failed to achieve the benefits of the projects. Sponsor may provide action taken against the consultants for making poor inadequate proposals to cater the hazards of torrential floods.	Previously, the feasibility study was carried out by the Consultants in 2015-16. The scope of that study was limited to major hill torrents of District Mianwali only. Secondly, all the interventions proposed by the Consultants could not be implemented due to social issues, mainly related to land acquisition. Thirdly, a significant infrastructural development—the construction of Motorway M-14 between 2019 and 2022—has altered the dynamics of hill torrents in the area. Given these factors, for which the consultants cannot be held	Noted

Sr. No	Observations	Departmental Reply	Pre-PDWP Decision
		accountable, a fresh feasibility study is now required.	
2.	The Sponsor have executed many projects to contract the damages of hill torrents in Tehsil Isa Khel. The detail of expenditure from the year 2016 to date may be provided to this office.	The details of expenditures are enclosed herewith.	Noted
3.	The report of the feasibility study depicts that solutions to contract the damages of Nullahs D/S meanwhile Bannu road were given by the Consultants but could not implemented due to hindrance by the inhabitants. Sponsor may certify how this issue will be resolved if protection works will be proposed under the new feasibility study.	Previously, the provision of Land Acquisition wasn't included in the project that's why private land owners resisted the execution of work. Now, the land acquisition will be made part of PC-I where any intervention is proposed by the Consultants on hill torrents.	Noted
4.	The report of the feasibility study is depicting that several DEC meeting were convened by the Irrigation Department which recommended for a fresh feasibility study of hill torrents. Sponsor may make the minutes of those meetings part of this PC-II.	The minutes of those meetings are enclosed herewith.	Noted
5.	As reveals from the report of feasibility study that inhabitants of D/s Mainwali Bannu road make hindrance in execution of the projects. Sponsor may ensure acquisition of required land prior to launching of new projects to avoid complications in future.	Previously, the provision of Land Acquisition wasn't included in the project that's why private land owners resisted the execution of work. Now, the land acquisition will be made part of PC-I where any intervention is proposed by the Consultants on hill torrents.	Noted
6.	Sponsor may seek willingness of the land owners at affidavit if land will fall under the alignment of Nullah channelization and the same may be made part of PC-II.		
7.	The Sponsor have made the provision of posts of senior Hydraulic & Design Engineer, Climate change Specialist, Geotechnical Engineers, Procurement and Contract Engineer, G.I.S specialist, Economist Sociologist but no junior has been provided for assistance. Sponsor may reduce the period / Man moths against the said posts and the provision of juniors may also be made in the PC-II.	Provision of Principal, Senior Engineers and man months is made according to minimum site requirements while 2 junior engineers would assist senior and principal engineers during work.	Noted
8.	The pay packages provided in the PC-II are not as per standard pay packages for the Consultants being used.	Pay packages have been revised according to NESPAK Staff Monthly Billing Rates as bench mark.	Noted
9.	The hiring of vehicles category 1 & 2 compressing 2 & 6 for 18 months is on much higher side. Sponsor may rationalize	Agreed. The compliance has been made.	Noted

Sr. No	Observations	Departmental Reply	Pre-PDWP Decision
	the number of vehicles as well as rates of hiring per month.		
10.	The office rent @ Rs. 600000/- per month is also on higher side. Sponsor may rationalize the same.	Agreed. The compliance has been made.	Noted
11.	The rate analysis for Non-Standardized items of survey work are not approved by the Competent Authority. Sponsor may attach approved copy of rate analysis with the PC-II.	Agreed. The compliance will be made.	Noted
12.	The quotations for lowest market rates are missing from the document. Sponsor may attach the same.	Agreed. The compliance will be made.	Noted
13.	Rs. 6.175 Million have been provided for publication and gazette notification. Sponsor may rationalize the same as this amount is on much higher side.	Agreed. The compliance has been made.	Noted
14.	Role of client agency needs to be clearly defined in the TOR's.	Agreed. The compliance has been made.	Noted
CONSULTANCY SECTOR			
15.	Proposed qualification requirement of Sediment specialist may be modified to degree in Geology, Earth Science, Environment Science and Sedimentology in addition to proposed qualification of this post.	Agreed. The compliance has been made.	Noted
16.	Discrepancy of mismatched has been observed in qualification requirement in job description and qualification heading. Sponsors may clearly indicate the exact qualification and experience requirement against each core team of expert.	Agreed. The compliance has been made.	Noted
17.	Sponsors may justify / delete Senior Climate Change Specialist in presence of Environmental Specialist.	Agreed. The compliance has been made. *(Senior Climate Change Specialist has been removed from PC-II)*	Noted

Part-C

24. **Economic/Financial Appraisal**

N/A

Part-D

25. **Environmental Appraisal**

Not provided

26. **Consideration by Pre-PDWP**

The Pre-PDWP meeting of the PC-II was convened on 24-02-2025 under the Chairmanship of Member (Water) P&D Board, Lahore. The comments / observations raised by Irrigation and Consultancy Sectors of P&D Board has been attended by the

administrative department. Hence the scheme is recommended for placement before PDWP.

27. **Observation & Recommendations**

The PC-II at a cost of **Rs. 138.878 Million** with the gestation period of **18 Months** is submitted before PDWP for consideration.

Consultancy Charges

Remunerations

S/N	Specialist	Assignment Man Months		Total Man Months	[1] Rate/Month	Amount
		Person	Month			
1	Team Leader / Project Manager	1	15	15	752,100	11,281,500
2	Principle Hydrologist	1	5	5	584,200	2,921,000
3	Environmental Specialist	1	6	6	472,600	2,835,600
4	Senior Hydraulic Design Engineer	1	8	8	472,600	3,780,800
5	Senior Structural Design Engineer	1	8	8	472,600	3,780,800
6	Senior Geotechnical Engineer	1	6	6	472,600	2,835,600
7	Senior Procurement and Contracts Engineer	1	2	2	472,600	945,200
8	Senior GIS Specialist	1	6	6	472,600	2,835,600
9	Senior Economist	1	1	1	472,600	472,600
10	Senior Sociologist	1	4	4	472,600	1,890,400
11	Junior Engineer	2	12	24	225,000	5,400,000
12	Quantity Surveyor	2	9	18	110,400	1,987,200
13	Surveyor	2	9	18	110,400	1,987,200
14	AutoCAD Operator	1	15	15	90,700	1,360,500
15	Computer Operator	1	15	15	90,700	1,360,500
16	Patwari	2	9	18	90,700	1,632,600
17	Girdawar	1	9	9	90,700	816,300
					Total For Remunerations	***48,123,400***
					PST 16%	7,699,744
					Total For Remunerations carried over to Summary of cost	***55,823,144***

[1] = All Salaries are exclusive of 16% PST but include all other taxes.

Direct Cost Components

S/N	Description	Assignment		Qty	Rate/Month	Amount
		No	Month			
A	**Vehicles**					
1	***Hiring/ running, maintaining vehicles including POL driver complete (for field use only).***					
	Hiring / running , maintaining vehicles (4x4 Double Cabin) including POL driver complete (for field use only)	2	15	30	300,000	9,000,000
	Hiring / running, maintaining vehicles (1300 CC) including POL driver complete (for office pool + field use)	0	15	0	225,000	0
B	**Office Rent Maintenance/ Equipment**					
	For Study/Consultancy where separate project office is established. (Rent/Maintenance of office building including all necessary accessories)	1	15	15	300,000	4,500,000
C	**Equipment/ Stationary/ Printing etc.**					
	For Study/Consultancy for design, feasibility, supervision (At Lump Sum rate of 75000/- per month).	1	15	15	75,000	1,125,000
	Total For Direct Charges carried over to Summary of cost					***14,625,000***

Geotechnical Investigation

S/N	Description	Ref	Qty	Unit	Rate	Amount
1	Mobilization and Demobilization	Lowest Market Rate	2	1	150000	300000
2	Drilling of boreholes for sub surface geological investigations to assess foundation condition, depth of bed rock, type of underlying strata, permiability of strata, different structures and characteristics of strata.	Lowest Market Rate	2500	Rft	2500	6250000
3	Shifting of drilling machinery from hole to hole.	Lowest Market Rate	100	Job	10000	1000000
4	Obtaining un-disturbed soil samples from bores, labelling, storing as per standards in Airtight containers.	Lowest Market Rate	100	Job	8000	800000
5	Performing Standard Penetration Test (SPT) at different location within project area as identified by the Engineer In-charge.	Lowest Market Rate	30	Job	12000	360000
6	Performing Direct Shear Strength Test (DST) over soil samples collected from within the project area or from bore holes as identified by the Engineer In-charge.	Lowest Market Rate	30	Job	8000	240000
7	Performing Point Load test over rock samples collected from within the project. area or from bore holes as identified by the Engineer In-charge.	Lowest Market Rate	30	Job	25000	750000
	Total For Soil Investigations carried over to Summary of cost					***9700000***

Topographic Survey

S/N	Description	Ref	Qty	Unit	Rate	Amount
1	Surveying and supplying maps as per prevailing coordinate system in Pakistan (3 copies on paper, one on tracing paper and one soft copy of all survey on CD) of hll torrents alignment with ROW and plantation line with all related NSL, FSL, Bed Level, Embankment Level, L-Section and R.L of land per Acre, showing 3ft contour interval scale 1:2000 with vertical and horizontal torelance 0.25± inch and ic shifting and fixing B.Ms. R.C.C pillar (size 2'x2'x3') at suitable places on both sides, x-section of all hydraulic structures with their location and GPS coordinates complete drawings, route of hill torrents, road & railway crossings etc. All drawings and maps showing important features complete in all aspects with signatures and stamps. Shifting of B.M from neaest SOP (Survey of Pakistan) B.M and closing on same B.M (recording reading on level book and provodong to checking agency). As per direction and entire satisfaction of Engineer in Charge. All level books, check level books, B.M. Register and other project records will be handed over to client with feasibility report. (The 150000-acre area for topographic survey of the project is taken as Tentative)	Rate Analysis	135000	Acre	385.00	51975000
2	Surveying X-Section and L-Section of hill torrents of Khushab and Mianwali along with all calulation of areas used in cost estimate showing ROW line and plantation line. Supplying five copies on graphical sheet and five soft copy of all survey on CD) of hll torrents alignment As per direction and entire satisfaction of Engineer in Charge.	Rate Analysis	225000	Rft	8.00	1800000
Total For Survey and Investigations carried over to Summary of cost						**53775000**