GOVERNMENT OF THE PUNJAB
IRRIGATION DEPARTMENT

PC – II FOR

REVIEW OF FEASIBILITY STUDIES AND DETAIL DESIGN FOR DRAINAGE SCHEMES IN SELECTED AREA OF IRRIGATION ZONE BAHAWALPUR.

Cost for Rs. 43.495 Million

June, 2021

Bahawalpur Irrigation Zone, Bahawalpur

PC-II FORM
FOR
REVIEW OF FEASIBILITY STUDIES AND DETAIL DESIGN FOR DRAINAGE SCHEMES IN SELECTED AREA OF IRRIGATION ZONE BAHAWALPUR.

CONTENTS

PC-II FORM

PROFORMA FOR DEVELOPMENT PROJECTS

(SURVEY AND FEASIBILITY PROJECT)

1.	Name of Project	REVIEW OF FEASIBILITY STUDIES AND DETAIL DESIGN FOR DRAINAGE SCHEMES IN SELECTED AREA OF IRRIGATION ZONE BAHAWALPUR.
	Location	District Bahawalnagar, Rahimyar Khan and Bahawalpur.
2.	**Administrative Authorities responsible for:-**	
i.	Sponsoring	Government of the Punjab
ii.	Execution	Punjab Irrigation Department
3.	**Details of Survey/Feasibility Study:-**	
i.	General Description and Justification	This PC-II is prepared for feasibility review and detailed design of three number drainage schemes in selected areas of Bahawalpur Irrigation Zone which are titled as under:- 1. Reclamation of water logged agriculture land of Border area along Hakra Canal. 2. Mitigation of water logging in District Rahimyar Khan. 3. Reclamation of water logged agriculture land in command area of Abbasia Canal and Abbasia Link Canal. The feasibility study alongwith detailed design up to approval of PC-I has been carried out by the PIAP Consultants NESPAK Lahore. The PC-I for the above mentioned two number schemes reflected at serial No. 1 & 2 has been approved by Planning and Development Department in 2018 subject to the

condition that**"sponsors will have third party review of the feasibility study/detailed design by the renowned consultants before execution as per framework issued by P&D" the** Department will get third party review before going to the execution phase. The PC-I of the third scheme has been deferred with the same condition.

To meet with the above mentioned condition imposed by the P&D Department, this PC-II is prepared to hire the consultants to carry out Third Party Evaluation of above mentioned drainage schemes.

BRIEF INTRODUCTION

The scheme wise introduction is briefed as under:-

1. Reclamation of Water Logged Agriculture Land of Border area along Hakra Canal

The project falls in jurisdiction ofBahawalnagar District of the Punjab Province in Bahawalpur Irrigation Zone.

Water level hasarisen alarmingly in 21,600 acres area along Hakra Branch Canal from RD. 20+000 to 50+000 and 175+000 to 260+000. An area of about 53,000 acres has beenaffected due to rise in water level. The groundwater table in vast belt between Indian Border and left side of Hakra Branch has considerably been raised during the last 10 years. The agriculture productivity of this area has been reduced.

Water logging has caused adverse social and economic effect on local community causing poor living standard, health problems for humans and animal, crumbling of mud and brick houses and difficulties for flow of traffic. Many people have migrated to other places. This adverse condition has necessitated the implementation of remedial measures to give relief to effected area.

2. Mitigation of Water Logging in District Rahimyar Khan.

The project area falls in the jurisdiction of Tehsil Sadiqabadof District Rahimyar Khan. The irrigation network of about 167 miles length provides irrigation water to 1.6 million acre area in Rahimyar Khan District. The irrigation water is provided to this fertile land through three canals off-taking from Panjnad Head works namely Panjnad Main Line canal, Abbasia canal and Abbasia Link canal. Water logging and salinity problem emerged during seventies of the last century. The problem of water logging and salinity started aggravating after 40 years of the commissioning of Irrigation system. SCARP-VI was launched by WAPDA with the financial assistance of World Bank in order to reclaim the fertile lands of Rahimyar Khan by constructing surface drains besides installation of 514 tube wells in saline zone belt of the project area.

		Water logging has caused adverse social and economic effect on local community causing poor living standard, health problems for humans and animal, crumbling of mud and brick houses and difficulties for flow of traffic. The project aims for reclamation of 26000 acres of severely water logged area where as a total of 90,497 acres of partially waterlogged area will also be benefitted. **3 Reclaiming Water Logged Agriculture Land in command area of Abbasia Canal and Abbasia Link Canal.** The project area falls in the jurisdiction of Bahawalpur Irrigation Zone and spreads inTehsilLiaqatpur&Khanpur of District Rahimyar Khan and Tehsil Ahmadpur East of Bahawalpur District. The area comprising of 61,914 acres of Gross Command Area, including agricultural lands of 41,883 acres which has been waterlogged needs reclamation under this project.
ii.	Implementation Period	Implementation schedule is attached as**Annexure-I** and completion time of the review study is 6 months.
iii.	Estimated Cost	Estimated cost is 43.495 million. Breakup of cost estimate is provided in **Annexure-II.**
iv.	Date and basis of cost estimates	The cost estimate is based on the prevailing rates of domestic consultants and remunerations fixed by Government of Punjab for recruiting contract staff on market based salaries.
v.	Manpower requirement	Detail are available in attached **Annexure-III.**
vi.	Financial plan	Funding for the Project will be made from the block allocation for feasibility studies as provided in ADP 2021-22. Total cost of the study is 43.495 million. Details are available in attached **Annexure-II**.
4. i.	Expected outcome	Third Party Evaluation Report of Feasibility study and PC-I of the project. The Terms of Reference of the Study are attached in **Annexure-IV**.
ii.	Benefit of the Project Economic, Financial and non quantifiable.	The 53,600 acres agriculture land along Hakra Canal of District Bahawalnagar, 90,497 acres agriculture land in District Rahimyar Khanand 41,883 acres agriculture land of District Bahawalpur will get relief from water logging. This reclamation also aims at incremental production via increased yield and higher intensity of agriculture with project condition.

5. Certified

The Name, Designation and phone No. of the officers responsible for preparing and checking PC-II for:-

"Review of Feasibility Studies and detail design for Drainage Schemes in Selected area of Irrigation Zone Bahawalpur"

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REVIEW OF FEASIBILITY STUDIES AND DETAILED DESIGN FOR DRAINAGE SCHEME IN SELECTED AREA OF IRRIGATION ZONE BAHAWALPUR.

REPORT.

INTRODUCTION

This PC-II is prepared for feasibility review and detailed design of three number drainage schemes in selected areas of Bahawalpur Irrigation Zone which are titled as under:-

4. Reclamation of water logged agriculture land of Border area along Hakra Canal.
5. Mitigation of water logging in District Rahimyar Khan.
6. Reclamation of water logged agriculture land in command area of Abbasia Canal and Abbasia Link Canal.

The feasibility study alongwith detailed design up to approval of PC-I have been carried out by the PIAIP Consultants NESPAK Lahore.

HISTORY

The scheme wise history is briefed as under:-

3. Reclamation of Water Logged Agriculture Land of Border area along Hakra Canal

The project falls in jurisdiction of Bahawalnagar District of the Punjab Province in Bahawalpur Irrigation Zone.

Water level has arisen alarmingly in 21,600 acres area along Hakra Branch Canal from RD. 20+000 to 50+000 and 175+000 to 260+000. An area of about 53,000 acres has been affected due to rise in water level. The groundwater table in vast belt between Indian Border and left side of Hakra Branch has considerably been raised during the last 10 years. The agriculture productivity of this area has been reduced.

Water logging has caused adverse social and economic effect on local community causing poor living standard, health problems for humans and animal, crumbling of mud and brick houses and difficulties for flow of traffic. Many people have migrated to other places.

Local inhabitants of Tehsil Haroonabad and Tehsil Fort-Abbas are making hue and cry over the grossly reduced yield of their agriculture land owing to aggravated water logging problem. Issue has already been highlighted from time to time; Roznama Dunya on 06-03-2013, Naw-e-waqat on 06-03-2013, Roznama Aosaf on 07-03-2013, Roznama Pakistan on 11-03-2015 and Daily Dawn on 06-05-2015. Issue has also been highlighted on electronic media. Mr. Sohail Warriach highlighted the issue in his program “Meray Mutabiq” on 21-03-2015 at Geo TV. Mr. Mujeeb-ur-Rehman Shami highlighted the issue on 26-03-2015 in his program “Nuqta Nazar” at Dunya TV. Local inhabitants have highlighted their problem before CM Secretariat, Secretary Irrigation, Chief Engineer Irrigation Bahawalpur and District Administration level.

Above mentioned hue and cry of the inhabitants of the project area and adverse condition has necessitated the implementation of remedial measures to give relief to effected area. To redress the grievances of the public of project area a feasibility study has been carried by PIAIP Consultants.

4. Mitigation of Water Logging in District Rahimyar Khan.

The project area falls in the jurisdiction of Tehsil Sadiqabad of District Rahimyar Khan. The irrigation network of about 167 miles length provides irrigation water to 1.6 million acre area in Rahimyar Khan District. The irrigation water is provided to this fertile land through three canals off-taking from Panjnad Head works namely Panjnad Main Line canal, Abbasia canal and Abbasia Link canal. Water logging and salinity problem emerged during seventies of the last century. The problem of water logging and salinity started aggravating after 40 years of the commissioning of Irrigation system. SCARP-VI was launched by WAPDA with the financial assistance of World Bank in order to reclaim the fertile lands of Rahimyar Khan by constructing surface drains besides installation of 514 tube wells in saline zone belt of the project area.

Agricultural productivity of the area has suffered due to shallow water table. Some areas of Sadiqabad Tehsil has become water logged due to seepages from canal network, field irrigation and the water table has risen and is now at ground surface at some places. Total area severely affected in the above mentioned region is about 24,000 acres.

The residents of this area, public representatives and media have highlighted this problem. Responsively, the government of Punjab intends to provide relief to the affected people with best possible solution of the problem. Accordingly, the Punjab Government has hired the services of PIAIP Consultants to study the problem of the area and suggest best possible remedial measures to be taken in these areas.

To redress the grievances of the public of project area a feasibility study has been carried by PIAIP Consultants.

4 Reclaiming Water Logged Agriculture Land in command area of Abbasia Canal and Abbasia Link Canal.

The project area falls in the jurisdiction of Bahawalpur Irrigation Zone and spreads inTehsil Liaqatpur & Khanpur of District Rahimyar Khan and Tehsil Ahmadpur East of Bahawalpur District. The area comprising of 61,914 acres of Gross Command Area, including agricultural lands of 41,883 acres.

Agricultural productivity of the area is suffering due to shallow water table. Some areas in Tehsil Liaqatpur of Rahimyar Khan District has become water logged due to seepages from canal network, field irrigation and the water table has risen and is now at ground surface at some places. Total area severely affected is about 143,062 acres.

Abbasia Link Canal System was constructed by WAPDA and commission in 2003 as part of Scarp-VI for segregation of perennial and non-perennial supplies of Khanpur and Rahimyar khan Canal Divisions as the area along Panjnad Canal was being water logged due to continuous supply through Panjnad Main Line for the command area of Khanpur and Rahimyar khan Canal Divisions. With the operation of this channel, the area in a pocket in between Abbasia Canal and Abbasia Link Canal started experiencing waterlogging which progressively increased over time.

The irrigators of the area, through public representatives and media have highlighted this problem. The government of Punjab intends to provide relief to the affected people with best possible solution of the problem. Accordingly, the Punjab Government has hired the services of PIAIP (NESPAK) Consultants to study the problem of the area and suggest best possible remedial measures to be taken in these areas.

To redress the grievances of the public of project area a feasibility study has been carried by PIAIP Consultants.

NECESSITY/JUSTIFICATION

On the basis of feasibility study ,the PC-I for the above mentioned two number schemes i.e Reclamation of water

logged agriculture land of Border area along Hakra Canal and Mitigation of water logging in District Rahimyar Khan have been approved by Planning and Development Department in 2018 subject to the condition that**"sponsors will have third party review of the feasibility study/detailed design by the renowned consultants before execution as per framework issued by P&D".** Thereforethe Department will have to get third party review before going to the execution phase. The PC-I of the third scheme i.e Reclamation of water logged agriculture land in command area of Abbasia Canal and Abbasia Link Canal has been deferred with the same condition.

To meet with the above mentioned conditionimposed by the P&D Department, this PC-II is prepared to hire the third party consultants to carry out Third Party Review of above mentioned drainage schemes so that the grievances of the public in project area could be redressed in proper way.

Executive Engineer
Drainage Division
Bahawalnagar

Implementation Schedule

SR No.	ACTIVITY DESCRIPTION	Month-1				Month-2				Month-3				Month-4				Month-5				Month-6			
		Wk-1	Wk-2	Wk-3	Wk-4	Wk-1	Wk-2	Wk-3	Wk-4	Wk-1	Wk-2	Wk-3	Wk-4	Wk-1	Wk-2	Wk-3	Wk-4	Wk-1	Wk-2	Wk-3	Wk-4	Wk-1	Wk-2	Wk-3	Wk-4
1	Inception Report																								
2	Monthly Progress Report																								
3	Draft Evaluation Report for Feasibilities and PC-I																								
4	Final Evaluation Report for Feasibilities and PC-I																								
5	Detailed Presentation (as and when required by the Client)																								

ANNEXURE-II

REVIEW OF FEASIBILITY STUDIES AND DETAIL DESIGN FOR DRAINAGE SCHEMES IN SELECTED AREA OF IRRIGATION ZONE BAHAWALPUR

ABSTRACT OF COST

1	A - SALARY COST	36,197,800
2	B - DIRECT COST	6,950,000
Total		**43,147,800**
	Add 5% PST on Direct Cost	**347,500**
Rs. In Million		**43.495**

REVIEW OF FEASIBILITY STUDY AND DETAIL DESIGN FOR DRAINAGE SCHEMES IN SELECTED AREA OF IRRIGATION ZONE BAHAWALPUR

B - Direct Cost

Sr. No.	Description	Quantity	Rate / Month	Period	Amount
1	Rental Vehicles with driver, POL, Maintenance complete	6	125,000	6	4,500,000
2	Office rent Expenses with utilities furniture complete in all respect	1	225,000	6	1,350,000
3	TA/DA	L.S	500,000	….	500,000
4	Printing/binding etc of reports stationary etc complete	1	100,000	6	600,000
				Total	**6,950,000**

REVIEW OF FEASIBILITY STUDY AND DETAIL DESIGN FOR DRAINAGE SCHEMES IN SELECTED AREA OF IRRIGATION ZONE BAHAWALPUR

A - SALARY CHARGES

Sr. No	Specialist	Quantity	Months	Rate/month	Amount (Rs)
1	Team Leader	1	6	600,000	3,600,000
2	Principal Irrigation/Hydraulic design Engineer	1	6	480,000	2,880,000
3	Principle Hydrologist	1	4	480,000	1,920,000
4	Principal Structural Design Engineer	1	6	480,000	2,880,000
5	Senior Mechanical Engineer	1	3	375,000	1,125,000
6	Senior Geotechnical Engineer	1	4	375,000	1,500,000
7	Economist/Financial Specialist	1	3	375,000	1,125,000
8	Environmental /Resettlement Specialist	1	5	375,000	1,875,000
9	Senior Electrical Engineer	1	2	375,000	750,000
10	Procurement & Contract Engineer	1	2	375,000	750,000
11	Junior Engineer Hydraulics /Irrigation	3	6	225,000	4,050,000
12	Junior Engineer Structure	2	5	225,000	2,250,000
13	Junior Engineer Geotech	1	3	225,000	675,000
14	Junior Engineer Mechanical	1	2	225,000	450,000
15	Junior Engineer Ground Water	1	3	225,000	675,000
16	Draftsman	2	4	70,000	560,000
17	Computer operator/ Auto cad Operator	3	6	50,000	900,000
18	Surveyor / Helper	6	4	60,000	1,440,000
19	Patwari	6	4	50,000	1,200,000
20	Gardawar	3	4	50,000	600,000
	TOTAL				**31,205,000**
add GST @16 on remuneration					**4,992,800**
Cost in Million					**36,197,800**

ANNEXURE-III

REVIEW OF FEASIBILITY STUDIES AND DETAIL DESIGN FOR DRAINAGE SCHEMES IN SELECTED AREA OF IRRIGATION ZONE BAHAWALPUR

Manpower Requirement

Sr No.	Key Personal	Experience Years	Field of Experience	Qualification
1	Team Leader	25	Irrigation Sector/ Drainage Project	Msc. & Bsc Civi Engineering
2	Principal Irrigation/Hydraulic Design Engineer	20	Design of Irrigation Channels & Drains	Msc. & Bsc Civi Engineering
3	Principal Hydrologist	20	Design of Civil works Channels & Drains	Msc. & Bsc Civi Engineering
4	Principal Structural Design Engineer	20	Design of Structures and Pump House	Graduate Civil Engineer
5	Senior Mechanical Engineer	20	Design/Fabrication and operation of Pump House Machinery and Machnical equipments.	Bachelors Degree in Mechnical Engineer
6	Senior Geotechnical Engineer	20	Design of Civil works for major Hydraulic structure	Graduate Civil Engineer
7	Economist/Financial Specialist	15	Costing and analyzing the economics of major irrigation investment projects.	Master Degree in Project Economics
8	Environmental/Resettlement Specialist	15	Preparing resettlement action plan and Environmental impact assesment.	Master Degree in Project Environment
9	Procurement & Contract Engineer	15	Must have experience of more than 15 years of relevant working experience in procurement and contracts management of large civil engineering projects, preferably water sector projects	B. Sc. Civil Engineering or Master's degree in Contracts Administration or Construction Management from a recognized university.

10	Senior Electrical Engineer	8	Electrical Engineering	Bachelors Degree in Electrical Engineer
11	Junior Engineer Hydraulics/Irrigation	5	Hydraulic & Hydraulic Structure	B. Sc Engineer (Civil)
12	Junior Engineer Structure	5	Hydraulic Structure	B. Sc Engineer (Civil)
13	Junior Engineer Geo Tech	5	Geo Investigation	B. Sc Engineer (Civil)
14	Junior Engineer Mechanical	5	Irrigation Machinery	B. Sc Engineer (Mechnical)
15	Junior Engineer Ground Water	5	Irrigation Ground Water	B. Sc Engineer (Civil)
16	Draftsman	5	Drawing of canal system and related structure etc.	Diploma of Associate Engineer
17	Computer Operator / Cad Operator	5	Auto Cad & Quantity Estimation	Diploma of Associate Engineering
18	Surveyor / Helper	5	Irrigation and Drainage Survey work	Diploma of Associate Engineering
19	Patwari	3	Relevant field of Patwari	Basic Diploma of Patwar
20	Gardawar	5	Relevant field of Gardawar	Basic Diploma of Patwar

Review of Feasibility Studies and Detail Design for Drainage Schemes In Selected Areas of Bahawalpur Irrigation Zone

1) Background/ Introduction.

This PC-II is prepared for feasibility review and detailed design of three number drainage schemes in selected areas of Bahawalpur Irrigation Zone which are titled as under:-

7. Reclamation of water logged agriculture land of Border area along Hakra Canal.
8. Mitigation of water logging in District Rahimyar Khan.
9. Reclamation of water logged agriculture land in command area of Abbasia Canal and Abbasia Link Canal.

The feasibility study alongwith detailed design up to approval of PC-I has been carried out by the PIAP Consultants NESPAK Lahore. The PC-I for the above mentioned two number schemes reflected at serial No. 1 & 2 has been approved by Planning and Development Department in 2018 subject to the condition that **"sponsors will have third party review of the feasibility study/detailed design by the renowned consultants before execution as per framework issued by P&D".** Therefore the Department will have to get third party review before going to the execution phase. The PC-I of the third scheme has been deferred with the same condition.

To meet with the above mentioned condition imposed by the P&D Department, this PC-II is prepared to hire the consultants to carry out Third Party Evaluation of above mentioned drainage schemes.

BRIEF INTRODUCTION

The scheme wise introduction is briefed as under:-

i) Reclamation of Water Logged Agriculture Land of Border area along Hakra Canal

The project falls in jurisdiction of Bahawalnagar District of the Punjab Province in Bahawalpur Irrigation Zone.

Water level has arisen alarmingly in 21,600 acres area along Hakra Branch Canal from RD. 20+000 to 50+000 and 175+000 to 260+000. An area of about 53,000 acres has been affected due to rise in water level. The ground water table in vast belt between Indian Border and left side of Hakra Branch has considerably been raised during the last 10 years. The agriculture productivity of this area has been reduced.

Water logging has caused adverse social and economic effect on local community causing poor living standard, health problems for humans and animal, crumbling of mud and brick houses and difficulties for flow of traffic. Many people have migrated to other places. This adverse condition has necessitated the implementation of remedial measures to give relief to effected area.

ii) Mitigation of Water Logging in District Rahimyar Khan.

The project area falls in the jurisdiction of Tehsil Sadiqabad of District Rahimyar Khan. The irrigation network of about 167 miles length provides irrigation water to 1.6 million acre area in Rahimyar Khan District. The irrigation water is provided to this fertile land through three canals off-taking from Panjnad Head works namely Panjnad Main Line canal, Abbasia canal and Abbasia Link canal. Water logging and salinity problem emerged during seventies of the last century. The problem of water logging and salinity started aggravating after 40 years of the commissioning of Irrigation system. SCARP-VI was launched by WAPDA with the financial assistance of World Bank

in order to reclaim the fertile lands of Rahimyar Khan by constructing surface drains besides installation of 514 tube wells in saline zone belt of the project area.

Water logging has caused adverse social and economic effect on local community causing poor living standard, health problems for humans and animal, crumbling of mud and brick houses and difficulties for flow of traffic. The project aims for reclamation of 26000 acres of severely water logged area where as a total of 90,497 acres of partially waterlogged area will also be benefitted.

iii) Reclaiming Water Logged Agriculture Land in command area of Abbasia Canal and Abbasia Link Canal.

The project area falls in the jurisdiction of Bahawalpur Irrigation Zone and spreads in Tehsil Liaqatpur & Khanpur of District Rahimyar Khan and Tehsil Ahmadpur East of Bahawalpur District. The area comprising of 61,914 acres of Gross Command Area, including agricultural lands of 41,883 acres which has been waterlogged needs reclamation under this project.

2) Implementing Agencies

Punjab Irrigation Department

3) Project Location and Geographical area to be covered

Scheme wise project location and geographical area to be covered is discussed as under:

i) Reclamation of Water Logged Agriculture Land of Border area along Hakra Canal

The proposed project is located in the south-eastern part of Punjab Province. It covers part of the tehsils of Bahawalnagar, Haroonabad and Fortabas in Bahawalnagar District. The area is bordered on the northwest by the Malik Branch canal, on the south by lands served by the Hakra canal and on the east by India.

Gross command area (GCA) under the project is 670,665 acres and Cultivable commanded Area (CCA) is about 547,444 acres. There are approximately 242,000 inhabitants, living in a rural setting with many villages. Major town in the area is Haroonabad. The study area is located in the Hakra command area, between latitude 29°3′35″ N to 29°56′3″ N and longitude 72°14′35″ E to 73°26′17″ E.

The area consists of both, alluvial and Aeolian plains. The Sutlej River and former Hakra River constituted the active and abandoned alluvial flood plains. The rolling dune-covered Aeolian plains are constituted by the Cholistan Desert. The topography of the area is generally flat with outcropping sand dunes. Natural drainage is lacking in the area. The natural surface level varies from 479 ft to 535 ft above mean sea level. The lands are sloping in the southwest direction. The top soil is medium-textured and is underlain by thick sand and silt of several hundred meters. The occurrence of compact and calcareous silty/clay non-continuous layers at varying depths that restrict the groundwater flow to deeper layers and act as barriers is reported. The alluvial deposits are formed during recent and Pleistocene ages.

ii) **Mitigation of Water Logging in District Rahimyar Khan**

The project area falls in the jurisdiction of Bahawalpur Irrigation Zone and spreads in Tehsil Sadiqabad of district Rahimyar Khan. Agricultural productivity of the area has suffered

due to shallow water table. Some areas of Sadiqabad Tehsil has become water logged due to seepages from canal network, field irrigation and the water table has risen and is now at ground surface at some places. Total area severely affected in the above mentioned region is about 24,000 acres.

The irrigation water is provided to this fertile land through three canals off-taking from Panjnad Head works namely Panjnad Main Line canal, Abbasia canal and Abbasia Link canal. Water logging and salinity problem emerged during seventies of the last century. The problem of water logging and salinity started aggravating after 40 years of the commissioning of Irrigation system.

Soils in the project area are mostly coarse to medium textured, calcareous and therefore slightly alkaline, low in organic matter and nitrogen, low to moderately low in phosphorous and well supplied with potash. Most of the soils are quite permeable, well aggregated and non-erosive, have moderate water holding capacities and are resistant to alkali hazards. In short, the project area soils are good and have as high a production potential.

iii) **Reclaiming Water Logged Agriculture Land in command area of Abbasia Canal and Abbasia Link Canal**

The project area is located in Bahawalpur Irrigation zone and is under Bahawalpur civil administrative Division. This area is in a triangular shape with Panjnad Barrage near Uch Sharif Chenab and Indus rivers in the north-west, Ahmedpur in East, Cholistan desert in south and Rahimyar Khan in south-west in Bahawalpur and Rahimyar Khan Districts of Punjab. This study area is located in Latitude ranging from 29°13'23.90"N to 28°35'2.89"N and Longitude 71°3'56.37"E to 70°44'24.19"E. Agricultural productivity of the area is suffering due to shallow water table. Some areas in Liaqatpur Tehsil Rahimyar Khan District has become water logged due to seepages from canal network, field irrigation and the water table has risen and is now at ground surface at some places.

Abbasia Link Canal System was constructed by WAPDA and commission in 2003 as part of Scarp-VI for segregation of perennial and non-perennial supplies of Khanpur and Rahimyar khan Canal Divisions as the area along Panjnad Canal was being water logged due to continuous supply through Panjnad Main Line for the command area of Khanpur and Rahimyar khan Canal Divisions. With the operation of this channel, the area in a pocket in between Abbasia Canal and Abbasia Link Canal started experiencing waterlogging which progressively increased over time.

4) Objectives of Consultancy

a) Overall Objectives

Overall objective of consultancy services is to review and update the following feasibility studies carried out by PIAIP Consultants and to prepare detail design, PC-I, construction drawings, BOQ, tender documents for the projects.

1. Reclamation of water logged agriculture land of border area along Hakra canal.
2. Mitigation of water logging in District Rahimyar khan.
3. Reclamation of water logging agriculture land in command area of Abbasia canal and Abbasia link canal.

The Objectives of the feasibility studies conducted were to:

- Eradication of water logging and salinity menace of the agriculture lands.
- Lowering and controlling groundwater table levels which would facilitate agricultural production.

- Provide safe disposal of saline groundwater.
- Enhance the agricultural productivity of lands and bring about prosperity of the deprived people.

Water logging has caused adverse impacts on the living standard of the population of project area, directly or indirectly depends on agriculture for their livelihood and as such the project objectives has direct linkage with the sector objectives as reclaimed areas would benefit the local communities to improve their living standard.

b) Specific Objectives

The purpose of the consultancy services is to carryout detail review of feasibility study conducted by the PIAP consultants.

- The consultants shall carryout detail reconnaissance survey of the project area, review the feasibility studies carried out by the consultants and submit their review report.
- The consultants shall carryout necessary survey required to verify the baseline data and any investigation which they deem necessary to verify the field conditions.
- The Consultants shall prepare detail report on their review of feasibility studies which shall cover all environmental, economic, social, technical aspect of the projects.
- The consultant shall identify any gaps in feasibility, update the feasibility study and submit the draft updated report on feasibility study.
- The consultants shall submit the final updated feasibility study report after incorporation of comments of the client.

- After submission of final feasibility study report the consultant shall review the design of all civil, electrical and mechanical components of the project and prepare the detail design report of all structures involved in the project along with reference material.

- The consultants shall prepare land acquisition documents and identify the land acquisition requirement along with any resettlement requirement with cost estimate.

- The consultants shall prepare detail land acquisition documents from revenue record.

- The consultants shall prepare detail drawings based on detail design of each structural component involved in the project with detail cost estimate, rate analysis of non-standardized items of work, PC-1, BOQ, Tender documents etc.

5) Time duration for proposed consultancy.

The completion time for the review of feasibility studies is proposed as 6-Months.

6) SCOPE DUTIES & RESPONSIBILITIES OF CONSULTANTS

a) General Scope of work

Phasing of Assignment

3.1. The assignment of Consulting Service's is divided into two phases (single contract):

(1) **Assignment A** is to ascertain needs/scope of field data collection, conducting and supervising investigations, surveys and material testing if any required, collection of all other requisite field data, reports, analysis / review of collected all type of data identified / required for the completion of review and updating feasibility reports. The consultants shall verify the already available data including investigation and surveys and shall submit their report.

(2) **Assignment B** will be divided in three batches.

B1: On the basis of collected field data, its analysis / review, detailed deliberations the consultants shall submit the review of feasibility reports prepared by the PIAP consultants. The consultants shall identify any gaps and shortcomings in feasibility studies and recommend the way forward. Consultants shall identify any additional investigation/survey required to update the feasibility studies and shall prepare updated feasibility study report. Consultants shall verify the existing survey and carryout additional survey if required.

B2: Detailed design / drawings of all structural components of project shall be prepared by consultants in respect of approved feasible sites as determined in batch B1 and shall be submitted along with detailed calculations and drawings

for each individual site based on topographic survey for approval by the competent authorities. All observations in this regard shall be diligently addressed by the consultants. The consultants shall make use of already available data including surveys and investigations and shall carryout additional investigation/survey required to complete the assignment.

B3: On the basis of approved detailed designs, prepare detailed estimates / PC-I's along with BOQ's and tender documents and draft for Section 4 under Land Acquisition Act along with its all pre-requisites shall also be included in this batch.

3.2 Time for completion of assignment A & B will be over period of 6 months in a single contract. The single contract for assignments A & B would be financed from Annual Development Program (ADP) Punjab as per allocated funds.

b) Detail Description of Assignments

The services under Assignment-A will include:

(i) Review of existing data including geotechnical investigation, topographic survey, material testing etc and to ascertain needs/scope of any additional field data collection required for review and updating of feasibility study duly considering all aspects including but not limited to topographical, geotechnical, hydrological, geological, social, environmental & resettlement, materials testing and structural data etc.

(ii) Collection, analysis and supervision of all type of data including quantity & quality assurance of all type of data ascertained for preparation of technical & economic feasibility report, detailed design and project preparation. The consultant shall determine and carryout the additional survey and geo technical investigation required for the project feasibility and detail design. Consultants shall be responsible to assure the correctness and completion of

topographic survey and geo technical investigation to their entire satisfaction for development of reliable databank for feasibility study and detail design. Collection of all type of secondary data from meteorological and other relevant departments required for completion of assignments shall also be the assignment of consultants.

(iii) Analysis / review of all type of collected data identified / required for completion of feasibility reports, detailed design and preparation of project.

Description of Assignment – B

The activities and scope of work for the Assignment – B will include, but not limited to the following:

(i) To carry out comprehensive review of already collected data / reports by department and developing best alternatives on basis of data collected.

(ii) To ascertain needs of further field tests/survey and construction material testing from approved lab required for geo technical, designing purpose and compilation of social / environmental and resettlement plans.

(iii) Review of all related available studies, reports and publications particularly of all the feasibility/ technical studies related to the project and related to the region and/ or globally.

(iv) Prepare review of feasibility study based on site inspection, study of already available data, field reconnaissance survey, verification of exiting investigation and survey and submit the review of feasibility study with their recommendations.

(v) Update the feasibility study reports based on shortcomings if any and prepare and submit the updated feasibility study report including all possible aspects i.e environmental impact assessment, resettlement studies, land acquisition, technical design reports, hydrological studies, sedimentation studies etc to achieve the objective of the project.

(vi) Carrying out detail hydraulic design covering all parameters / aspects related to nullah, drains, bridges, culverts, inlets, protection works, embankments required to achieve the objectives etc.

(vii) Carrying out detail structural design covering all parameters / aspects related to bridges / embankment, Inlets, culverts, diversion channels required to achieve the objectives etc.

(viii) Determine and study of various alternatives and identification of most suitable alternate with due consideration to technical, geo technical, ecological and environmental aspects.

(ix) Preparation of land acquisition documents as per Land acquisition Act 1894 as per relevant sections of act and as per record of revenue department. Consultant shall provide the Khasra / Killawise detail of land required to be acquired for each component and project along with copies of Ask-Shajra duly supported by revenue record.

(x) The consultants would prepare Resettlement Action Plan (RAP) along with cost estimate of resettlement.

(xi) Prepare draft feasibility report of the project including technical/engineering studies, hydraulic, hydrologic, structural, institutional, and economical / financial analysis, resettlement

cost and impacts and management plans. Specific conclusions / recommendations about the best alternate shall be essential part of the report.

(xii) The draft feasibility report will be submitted to client for review and comments.

(xiii) Approval of final feasibility reports from forum as directed by client.

(xiv) Preparation of detail hydraulic, structural and geotechnical etc. design of all structural components involved in the project as per individual site conditions and requirement and shall provide the detail design, L-Section, x-sections and construction drawings of each structure as per detail topographic survey of individual site.

(xv) Consultants shall include reference material used in detail design of each of the structural component in their detail design report shall also provide soft copy of design and drawings in the format as desired by the client department.

(xvi) Preparation of detailed cost estimates based on approved drawings by competent authority.

(xvii) Consultants shall prepare the rate analysis of all non-scheduled items as per procedure and criteria of Finance Department Government of Punjab.

(xviii) Preparation of bidding documents, including institutional and implementation arrangements, this also include, among other:

a. Prepare the detailed design, construction drawings, bills of quantities (BOQ) and tender documents for all aspects of work;
b. Preparing time bound implementation work plan and prepare bidding documents keeping in-view grouping of sub-projects in order to procure on the basis of PPRA rules.

(xix) All the documents be provided to the client in shape of hard copies & soft copies (editable format)

(xx) Preparation of PC-I as per requirements for getting approval from competent forum of PC-I.

All the data gathered through survey and investigation and reports prepared and submitted will be the intellectual property of the client.

5. Role of Client Agency

i. Client will provide initial data of Project to consultant and shall extend its cooperation / share its experiences for further development.

ii. The client will supervise field data collection like geological investigation (surface & subsurface), topographic survey, material testing, and topographic survey of all project area. However, the consultants will ascertain needs/scope of field data collection of each torrents

iii. The client shall conduct regular progress review meetings and iron out problems reported and reviewed in the monthly reports generated by Consultant. The meetings can also be called at the request of the Consultant more frequently, if required.

iv. The Consultant will coordinate closely with the client and other concerned forums indicated by client in discharging its obligations under the contract.

v. The Consultant will coordinate and liaison for all the matters related to the assignment with client personnel nominated in contract as client representative or demanded by the client as project requirement.

6. Core Team of experts required, indicating academic qualification, experience requirements and desired age limit with Job description of Key staff

. The consultants are encouraged to use the expertise available in Pakistan to the extent possible. The consultants are free to propose a staffing plan and skill mix necessary to meet the objectives and scope of services. If all required skills are not available within the consulting firms, they are encouraged to make joint ventures with other firms as per PEC guidelines. Following is an indicative list skill required for carrying out the assignment:

Sr. #	Position	Qualification	General/ Overall experience (Years)	Job Specific experience (Years)
I: KEY EXPERTS				

Sr. #	Position	Qualification	General/ Overall experience (Years)	Job Specific experience (Years)
1	Team Leader/Chief Design Engineer	Master Degree in any of the following disciplines of Civil Engineering (Hydraulics / Water Resources Engineering / Dams Engineering / Irrigation Engineering) from a recognized university with BSc Civil Engineering.	25	➢ 20 year's professional experience in planning, designing, development of design criteria, estimation, costing and construction supervision of mega water sector projects in renowned Consultancy firm / Government organization ➢ Experience in knowledge of latest Engineering design codes / practices. ➢ Capable to develop design criteria, constructional planning of structures, etc. ➢ Computer literate having experience of computing engineering techniques and software. ➢ Worked in a senior position at water sector projects. ➢ Well conversant in financial management of Local and foreign assisted projects.

Sr. #	Position	Qualification	General/ Overall experience (Years)	Job Specific experience (Years)
				➢ Possess knowledge of International / Local Bidding / procurement processes. ➢ Well versant with PPRA Laws, rules, policies, practices, etc. ➢ Fully conversant with Environmental Impact Assessment (EIA) and resettlement issues relating to water sector projects and of international donor's requirements / guidelines in this regards.
2	Principal Hydrologist	Master Degree in any of the following disciplines of Civil Engineering (Hydrology / Water Resources Engineering) from a recognized university. with BSc Civil Engineering.	20	➢ 15 Year's professional experience Hydrologic studies on major streams. ➢ Experience in knowledge of latest Engineering design codes / practices. ➢ Computer literate having experience of computing engineering techniques and

Sr. #	Position	Qualification	General/ Overall experience (Years)	Job Specific experience (Years)
				software.
3	Principle Hydraulics Design Engineer	M.Sc. in hydraulics or water Resource engineering from a recognized university with BSc Civil Engineering.	20	➢ 15 Year's specific professional experience in hydraulic design of water sector projects including hydraulic structures like Weir, Dams, Bridges, Cross Drainage Works, Appurtenant Hydraulic Structures. etc ➢ Experience in knowledge of latest Engineering design codes / practices. Computer literate having experience of computing engineering techniques and software.

Sr. #	Position	Qualification	General/ Overall experience (Years)	Job Specific experience (Years)
4	Senior Structural Design Engineer	M.Sc. in Structural Engineering/Hydraulic structures from a recognized university with BSc in Civil Engineering.	20	➢ 15 Years' specific professional experience in design of water sector projects including hydraulic structures like Weir, Dams, Bridges, Cross Drainage Works, Appurtenant Hydraulic Structures, etc. ➢ Experience in knowledge of latest Engineering design codes / practices. ➢ Capable to develop design criteria, constructional planning of structures, etc. ➢ Computer literate having experience of computing engineering techniques and software.
5	Senior Geotechnical Engineer	B.Sc. Civil Engineering with M.Sc. in Geotechnical Engineering from a recognized university.	20	➢ 15 Year's professional experience related to sub-surface investigation for hydraulic structures on or adjacent to major streams in the Indus Basin ➢ Experience in

Sr. #	Position	Qualification	General/ Overall experience (Years)	Job Specific experience (Years)
				knowledge of latest Engineering design codes / practices. ➢ Computer literate having experience of computing engineering techniques and software.
6	Economist / Financial Specialist	Master's degree in Economics or Project Economics from a recognized university.	15	➢ 10 Year's professional experience in costing and analyzing the economics of major irrigation projects. ➢ Computer literate having experience of computing techniques and software.
7	Resettlement specialist	Master's degree in Environment, social sciences, engineering management from a recognized university.	15	➢ 10 Year's professional experience in environment, social organizations, and preparation of resettlement Action Plan, Environmental Impact Assessment (EIA's) documents with hands-on experience of major irrigation projects

Sr. #	Position	Qualification	General/ Overall experience (Years)	Job Specific experience (Years)
8	Procurement & Contract Engineer	B. Sc. Civil Engineering or Master's degree in Contracts Administration or Construction Management from a recognized university.	15	➢ Must have experience of more than 15 years of relevant working experience in procurement and contracts management of large civil engineering projects, preferably water sector projects ➢ 05 years specific experience related to contract administration on large water sector projects. ➢ Worked in a senior position at water sector projects. ➢ Possess proven skills in procurement process (Both national and international), contract negotiation, claims handling ➢ Possess knowledge of International / Local Bidding / procurement processes. ➢ Well versant with PPRA Laws, rules, policies,

Sr. #	Position	Qualification	General/ Overall experience (Years)	Job Specific experience (Years)
				practices, etc.
9	Senior Mechanical Engineer	B. Sc. Mechanical Engineering from a recognized University.	15	➢ Design/ fabrication and operation of Pump House Machinery and Mechanical equipments.
10	Junior Engineer	B. Sc Civil Engineer	5	➢ 3 Year's professional experience in water sector relevant to the project assignment. ➢ Computer literate having experience of computing techniques and software.
11	Electrical Engineer	B. Sc Electrical Engineer.	10	➢ Having relevant experience regarding transmission line, installation of power house for operating lift pump and tube wells on the lift pumps house as well tube wells.

Indicative Job Description and Qualifications of Consultants' Key Staff required for Completion of Feasibility Study Reports.

1. **Team Leader / Chief Design Engineer:** Responsibilities of the Team leader / Chief Design Engineer will include but not limited to the following:

ii. Assume full responsibility for the consultants' team and performance of services under the consultancy contract;

iii. Ensure that the consultants' team undertakes comprehensive review of all already completed studies / literatures available with PID or any standard organizations;

iv. Keep the Client informed of technical issues and progress of all works both by informal and formal meetings and correspondence and assist in any project related issues which the Client may require;

v. Assists the Clint in preparing response to financiers or other authority's queries, observations, requirements etc related to this project**.**

vi. Coordinates with all concerned / involved / related organizations for this project issues.

vii. Attends, at Project level, all meetings as required and keep a record of all such meetings.

2. **Principal Hydrologist:** Total period of hiring is 04 months, hiring will be intermittent basis during 06 months. Responsibilities of the Principal Hydrologist will include but not limited to the following::

(i) Take the leadership in collecting and organizing all hydrological data and records required for updating the flood frequency analysis of the selected streams;
(ii) Delineate the catchment area.
(iii) Determinate catchment area characteristics
(iv) Determinate water availability, flood frequency, peak flood discharges etc.
(v) Using all available data, simulations and comparisons with like situations in other river basins, update and/or prepare a detailed and refined flood frequency analysis at the streams and comprehensive hydrographs of flood events for all return frequencies required by the principal hydraulic engineer and both the physical and mathematical modelers; and
(vi) Carryout mathematical modeler in assessing water levels upstream, downstream and at the site corresponding to floods of various return intervals.

3. **Principle Hydraulics Design Engineer:** Total period of hiring is 06 months, hiring will be intermittent basis during 06 months. Responsibilities of the Principle Hydraulics Design Engineer will include but not limited to the following:

i. Assist and report to Chief Design Engineer/Team Leader;
ii. Prepare all relevant technical documents related to hydraulic design of components of project;

iii. Ensure a comprehensive review of all already completed studies / literatures available with PID or any standard organizations;
iv. Prepare and produce hydraulic design parameters and design criteria viz-a-viz Client's requirements;
v. Prepare and formulate hydraulic design calculations, check for accuracy and ensure that appropriate standards were adopted. In case of any disagreement, refresh and update the design;
vi. Organize, supervise and carry-out any additional investigations deemed necessary for hydraulic aspects of any feature to be included in the components of Project;

4. **Senior Structural Design Engineer:** Total period of hiring is 06 months, hiring will be intermittent basis during 06 months. Responsibilities of the Senior Structural Design Engineer will include but not limited to the following:

i) Assist and report to Chief Design Engineer/Team Leader;
ii) Leads the design team and controls the design section.
iii) Ensure a comprehensive review of all already completed studies / literatures available with PID or any standard organizations;
iv) Prepare all relevant technical documents; related to structural design of the components of project;
v) Prepare and produce structural design parameters and design criteria viz-a-viz Client's requirements;
vi) Prepare and formulate structural design calculations, check for accuracy and ensure that appropriate standards were adopted. In case of any disagreement, refresh and update the design;
vii) Organize, supervise and carry-out any additional investigations deemed necessary for structural aspects of any feature to be included in the Project;
viii) Analyse structural design options where changes are required;
ix) Coordinate with the team for detailed design of all structural aspects of works including preparation of relevant additional construction drawings and specifications which may be required; and
x) Supervise topographic surveys, review the results of the topographical survey and geotechnical studies and integrate these considerations in the design.

5. **Senior Geotechnical Engineer:** Total period of hiring is 04 months, hiring will be intermittent basis during 06 months. Responsibilities of the Senior Geotechnical Engineer will include but not limited to the following:

(i) To select the best suitable site between the different alternative;
(ii) Monitor the subsurface investigation and provide necessary guidance in field data collection;
(iii) Carry out (organize and oversee) a comprehensive review of foundation conditions at each of the existing features and ensure conditions are such to ensure the long-term integrity water related structure;
(iv) Identify any remedial foundation stabilization work to be included in the package of works for the construction of water related structure;
(v) Formulate plans for and carry out detailed foundation investigations for each of the new works;
(vi) Supervise the work of the sub-contracted drilling, sampling and testing services to ensure compliance with best geotechnical practice;
(vii) Subsequent to the required sub-surface investigations and required laboratory testing, work with the Senior Structural Engineer in preparing detailed designs and specifications for the foundation treatment/features of the new structure works and any identified remedial work if required;
(viii) Assist in the preparation of the tender documents as required;

6. **Economist/Financial Specialist:** Total period of hiring is 03 months, hiring will be intermittent basis during 06 months. Responsibilities of the Economist/Financial Specialist will include but not limited to the following:

(i) Using input from various specialists on the team develop detailed feasibility level cost estimate for the different alternatives using different analysis techniques ensuring that all input and output can be used by government agencies in appraisal and by the Government of Punjab in PC-I preparation;
(ii) From the detailed cost tables identify all costs directly related to generating “with-project” benefits;
(iii) Identify and quantify the estimated benefits resulting from the investments including the benefits associated with reduced risk of infrastructure failure and other associated risks.
(iv) Undertake detailed economic analysis of the project for Economic Analysis ensuring that it meets the viability requirements of both donor agencies and the Government of Punjab;

7. **Resettlement Specialist:** Total period of hiring is 05 months, hiring will be intermittent basis during 06 months. Responsibilities of the Resettlement Specialist will include but not limited to the following:

(i) Develop methodology and instruments for social assessment for the potentially affected people and areas.

(ii) Review all national and provincial statutory, customary and administrative framework (of Punjab Province) relevant to the project interventions in the resettlement context (categories land ownership, yardstick for inventories of different type of structures, trees, construction quality and categorization of built-up priorities, land acquisition procedures, provisions for public notification regarding cut-off-date for compensation etc.).

(iii) Based on the comprehensive review of country legal framework and guidelines of govt identify the resettlement principles for all types of affected peoples.

(iv) Carry out a full-scale field assessment and develop definitions for entitlements for compensation for the properties of potentially affected people (houses, lands, crops, trees, lost income, relocation allowance and entitlement for support business activities) including squatters and encroachers. Develop an entitlement matrix;

(v) Assess the direct Impacts on people and properties

(vi) Organize series of consultations meetings with communities to create awareness about the project activities, and to ensure public participation.

(vii) Identification of alternative sites for resettling people and related assets

(viii) Development of Plan including identification of sites for resettlement, planning, infrastructure, utilities, and replacement houses etc.

(ix) Assess and calculate the cost of resettlement and compensation related activities.

(x) Settlement Action Plan

(xi) Plan for management of physical relocation and disbursement of actual compensation

INDICATIVE STAFFING REQUIREMENTS

The Consultants are expected to establish a Design Main office at Bahawalpur. The number of staff would depend on extent of work and the complexity of the system on which the team is working at a given time. The Client's indicative estimation of the professional team for review of feasibility of the three drainage project.

Table1. However, the prospective consultants should propose their own breakdown of staffing and level of effort staff work based on their own evaluation of the proposed services. The consultants should propose a realistic deployment schedule for all positions depending on work requirements as all positions listed in Table 1 would have inputs for different durations.

Table1. Estimation of Professional Person Months.

Sr. No	Specialist	Person-Months
1	Team Leader (1)	6
2	Principal Irrigation/Hydraulic Design Engineer (1)	6
3	Principal Hydrologist (1)	4
4	Principal Structural Design Engineer (1)	6
5	Senior Mechanical Engineer (1)	3

6	Senior Geotechnical Engineer (1)	4
7	Economist/Financial Specialist (1)	2
8	Senior Electrical Engineer (1)	3
9	Junior Engineer Hydraulics / Irrigation (3)	6
11	Junior Engineer Structure (2)	5
12	Junior Engineer Geo tech (1)	3
13	Junior Engineer Mechanical (1)	2
14	Junior Engineer Ground Water (1)	3
16	Draftsman (2)	4
17	Computer operator/ Auto cad Operator (3)	6
18	Surveyor / Helper (6)	4
19	Patwari (6)	4
20	Gardawar (3)	4

It is imperative to mention here that the semi technical level input i.e. surveyors, draftsman, auto-CAD Operators, quantity surveyor stench as not been included in summaries of person-months. However, the perspective consultants should include the cost of semi technical personnel in their financial proposal.

Job Description and Qualifications of Consultants' Key Staff required to review feasibility studies.

Sr. No	Category	Overall Experience	Post Mandatory Qualification Experience	Min Mandatory Qualification	Note
i.	Team Leader/Project Manager/CRE/ Chief Architect/Lead Specialist etc.	22	10	MSc Engineering / Masters/ M.Phil or equivalent Degree (18 year of education) in the relevant subject.	i) The exact qualification and experience requirement are to be indicated in the PC-II/TOR by the respective Procuring Agency keeping in view the need for the proposed consultancy. ii) For small scale projects experience requirement can be different for project lead, Accordingly the remuneration will be applied keeping in view the experience requirement.
ii.	Principal Engineer/ RE/ Senior Specialist / Senior Architect etc.	17	8	MSc Engineering / Masters/ M.Phil or equivalent Degree (18 year of education) in the relevant subject.	
iii.	Sociologist/Economist/Environmentalist/Agronomist/ Geologist / Health Sector Specialist etc. Network/ IT Engineer	15	7	Masters Degree/ M.Phil or equivalent (18 Years Of Education) in the relevant subject.	

iv.	Senior Engineer/ Architect / Town Planner / Specialist / etc.	10	5	BSc Engineering / Masters or equivalent Degree (16 years of education) in the relevant subject.	iii) The executing agency/sponsor shall determine the upper age limit of each of the key position as per requirement in PC-II
v.	Design Engineer/Architect/Consultant/Specialist	8	5	BSc Engineering / Master or equivalent (16 years of education)Degree in the relevant subject.	
vi.	Junior Engineer / Architect / Town Planner /specialist/ARE etc.	5	3	BSc Engineering / Master or equivalent Degree (16 years of education) in the relevant subject.	

7) Reporting/Deliverables with timelines

The consultants are likely to prepare reports as per schedule discussed hereunder. The consultant will prepare reports in English and provide ten (10) copies along with a soft copy of the key reports to the IA's. Additional, reports may have to be prepared as needed by the project authorities, based on needs.

Assignment A,B	**Months from Start of the Assignments of A / estimated duration to complete**
1. Inception report	Two weeks after award
2. Field data collection including review of geo-technical data survey data etc and acquisition of any additional data required to complete the assignment of updating feasibility study and review. Submission of review of feasibility study carried out by the PIAP Consultants.	within 1.5 months after award
3. Updating Feasibility reports (draft and final) of different alternative of project including, surface / subsurface geological investigation, hydrological study report, hydraulic & structural design report, estimates, economic and financial, environmental and social analysis, implementation plan etc. Environment and Social/Resettlement Reports, drawings etc.	Within 4 Months after award
4. Land Acquisition document as per Land	within 5 months after award

Acquisitions Act 1894 of relevant sections including all supporting documents from revenue department i.e Khasra/ Killawise detail of land to be acquired, Ask shajra etc.	
5. Detailed design Reports consisting of reports describing the different aspect of project of different alternatives for implementation. Detailed designs and construction drawings. Bidding documents for all civil works, hydraulic and mechanical equipment, BOQs, tender cost estimates and technical specification of the project.	within 6 months after award
6. Submission of final evaluation report for feasibilities and PC-I.	within 6 months after award
7. Preparation of tender documents, BOQs, Contractors qualification criteria, Monthly progress reports & monthly presentation. Reports for EMP, social action plan, resettlement plan (land acquisition) and work plans etc. (progress, draft and final reports)	within 6 months after award
8. Monthly progress reports & monthly presentation.	Periodically after 1st day of the 1st month to 8thday of month after award

8- PROFESSIONAL LIABILITY OF CONSULTANT AS PER PPRA RULES.

(i) The Consultant selected and awarded a contract shall be liable for consequences of errors or omissions on the part of the Consultant.

(ii) The extent of liability of the Consultant shall form part of the contract and such liability shall not be less than remunerations nor it shall be more than twice the remunerations.

(iii) The procuring may demand insurance on part of the Consultant to cover the liability of the consultant and necessary cost shall be borne by the consultant.

(iv) The consultant shall be held liable for all losses or damages suffered by the procuring agency on account of any misconduct by the consultants in performing the consulting services.