

Punjab Irrigated Agriculture Productivity Improvement Project (PIPIP)

Terms of Reference (ToRs) of M&E Consultants for Extended Period

1. Background

1.1 Punjab is population-wise the largest province of the country. Its geographical area is 20.63 million hectares out of total 79.60 million hectares or 25.92% of Pakistan. Of which, 0.50 million hectares or 1.24 million acres (2.42 %) are under forests, 2.98 million hectares or 7.36 million acres (14.5%) are uncultivable, 1.63 million hectares or 4.03 million acres (7.90%) are culturable waste, and 12.57 million hectares or 30.06 million acres (60.93%) are cultivated. It contains more than 70 percent cropped area that produces food.

1.2 Punjab's share in total agricultural production of the country is more than 80 percent in case of cotton, almost 70 percent for wheat, nearly 60 percent for sugarcane, and 50 percent in rice. Overall contribution of the province towards agriculture sector is estimated to be more than 80 percent and about 90 percent of it comes from irrigated areas. The irrigation efficiencies at the farm level are however, dismally low that is a major constraint in achieving potentially yields from otherwise highly productive agricultural lands. For solving the problem, Punjab has already implemented three (3) standalone projects (OFWM-I, II & III) and OFWM components of seven (7) multi-sector projects under OFWM program, Punjab since 1981. Those included improvement of water courses, precision land leveling, establishing demonstration centers, installation of community tubewells and construction of storage tanks. Also, training was imparted to personnel under these projects.

1.3 On Farm Water Management (OFWM) interventions included improvement of un-improved watercourses in the province for minimizing conveyance loss and improve water availability at the farm level as well as provision of LASER units to the service providers in irrigated areas of the province in order to carry out land levelling to reduce water application losses. It also included promoting drip and sprinkler irrigation systems to compliment the efforts for conservation and efficient use of irrigation water at farmers' field. All these interventions have been implemented as standalone projects and improvements being made have been contributing significantly towards enhancing water productivity at the farm level. Using the integrated model, all OFWM interventions have been planned under the Punjab Irrigated-Agriculture Productivity Improvement Project (PIPIP). The combined effect of these advancements are leading to maximize productivity of available water by minimizing water losses at various levels in order to ensure its adequacy, reliability, and effectiveness at the farm level.

1.4 The original PIPIP was approved for a period of five years (2012-13 to 2016-17) with a total cost of Rs. 36,000 million (government share of Rs. 21,250 million, all IDA financing, and farmers' contribution of Rs. 14,750 million). The PIPIP envisages improvement of 5,500 unimproved watercourses, completion of lining on 1,500 already improved watercourses in canal commands, rehabilitation of 2,000 irrigation schemes outside the canal commands, provision of 3,000 LASER units to the farmers/service providers, and installation of high efficiency irrigation systems (HEISs) on 120,000 acres. The key objective of the project is to

maximize productivity of irrigation water. It is indicated that provision of LASER land levelers, additional lining of watercourses and development of area irrigation schemes in non-canal commanded areas envisaged therein have been completed while installation of HEIS have been completed on about 30,000 acres and improvement of all unimproved watercourses have been completed. In view of huge socio-economic benefits of the project activities, the donor has agreed to enhance scope of these activities as well as extend gestation period of the project. Accordingly, PIPIP-Revised has been planned to further strengthen the ongoing efforts of upgrading the farm level water conveyance infrastructure and making the farmers well equipped with improved irrigation technologies together with creating an enabling environment for sustained technology transfer at the grassroots level for optimal and efficient management of available water resources. The activities of the PIPIP-Revised for the extended period are given as under.

- i) Installation of High Efficiency Irrigation Systems on about **120,000** acres (**30,000** acres completed under original project)
- ii) Improvement of **6,100** Unimproved Canal Irrigated Watercourses (**5,500** watercourses improved under original project)
- iii) Completion of **4,000** Partially Improved Watercourses (**1,500** watercourses improved under original project)
- iv) Rehabilitation of **3,400** Irrigation Conveyance Systems in Non-Canal Commanded Areas (**2,000** schemes rehabilitated under original project)

1.5 Project Components: The following four major components will be continued under the revised PIPIP with some amended and adjusted quantities, decided jointly by the WB experts, the Directorate General Agriculture (Water Management, PISC and M&E Consultants, based on their field experiences and the M&E feedback.

- i) **Component A** is designed to specifically address the problems of water losses at the fields and farm level by reducing the water application losses and improving water productivity;
- ii) **Component B** is aimed to improve farm level irrigation conveyance system in canal and non-canal command areas to improve conveyance efficiency;
- iii) **Component C** is designed to help adopt and promote modern irrigation technologies & practices and to carry out monitoring & evaluation of project impacts;
- iv) **Component D** is related to supporting project implementation, technical assistance and training.

1.5 Project Location/Area: The project activities would be implemented in the entire Punjab including canal irrigated and non-canal commanded areas.

2. Objective(s) of the Assignment

2.1 General: The overall objectives of the consulting services to be provided by the Monitoring and Evaluation (M&E) Consultants are to assist the Directorate General Agriculture (Water Management) of GoPunjab in monitoring and evaluation of the project activities in order to ensure the achievement of envisaged PDOs. The M&E consultants will

evaluate the project implementation in terms of meeting the project's objectives, and assess its physical, environmental, social, and economic impacts. The M&E activities will provide continuous feedback to the Project Policy Committee (PPC), Project Steering Committee (PSC) and the World Bank on the project's performance, and mitigation of negative impact under various components so that corrective actions can be undertaken in a timely manner, if necessary.

2.2 In accordance with the TORs of M&E consultants under original project, the consultants have developed the Project Management Information System (PMIS) to monitor key performance indicators, produce useful reports, and track achievements against the plan. The same is, however, at early stage of development and will further expanded and improved for new/additional activities of the project and also make provisions to accommodate future projects/activities. M&E consultants, in addition to monthly/quarterly/ annual reports, have submitted following reports regarding monitoring and evaluation of project interventions under original project.

- a) Baseline Survey Report
- b) Evaluation report on Determining Optimum Length of Watercourse Lining
- c) Assessment of Watercourse Improvement Benefits
- d) Economic and Financial Analysis of Additional Financing for PIP- Revised
- e) Economic Analysis of LASER Land Levelling
- f) Environmental and Social Assessment (ESA) for PIP-Additional Financing
- g) Suitability of Precast Parabolic Lining as an Alternate Technique for Lining Watercourses
- h) Impact of LASER Land Levellers on Socio-Economic Conditions of Farmers

2.3 The M&E consultants will further expand the already developed computer based state-of-the-art PMIS to monitor key performance indicators, visualization and production of useful reports, and track the project achievements as per planned targets. The reporting indicators and formats (including easy-to-read graphics) will be further expanded, refined, and organized (e.g. into input/process, output/outcome, or core/ancillary indicators) by the consultant as per requirement of Directorate General Agriculture (Water Management). The consultants will improve the PMIS to make it more user-friendly web-based software to manage project activities in accordance with the modern concept of project management and track key project indicators. The same will be installed on a secured web-server as per need of the Directorate General Agriculture (Water Management). It will also be linked with the GIS and possibly with the Google Earth map. The consultants will also prepare comprehensive standard operating procedure (SOP) regarding the use and access to this facility by different stakeholders in consultation with the Client and further train the field staff for its use.

2.4 In addition to regular monitoring, impact assessment studies will also be undertaken to evaluate the project performance and progress towards achieving the set objectives and providing recommendations to the Directorate General Agriculture (Water Management). As part of project evaluation, the consultant shall continue the overall project evaluation (based on key output and outcome indicators) of the monitored information and link up with the first phase findings to conclude for the whole of the project.

3. Scope, Duties and Responsibilities of the Consultant: The M&ECs will be responsible for monitoring & evaluation of the revised project impacts and in this context will carry out, but not limited to the following activities.

Task-1: Monitoring of the physical progress, identification of implementation issues, and suggestions for resolution

- i) The M&E consultants will continue to work on the selected key performance indicators for measuring and monitoring progress toward the project's development, as outlined in the Project Appraisal Document (PAD) of the original and revised project.
- ii) The consultants will refine indicators and reporting formats (including easy-to-read graphics) in consultation with Directorate General Agriculture (Water Management).
- iii) All aspects of the project including technical, environmental, social, economic etc. will be monitored to evaluate actual achievement against the activities planned in the PC-1 and/or PAD. Procurement and financial management guidelines and other relevant documents shall be made part of the PMIS for efficient and effective management of the project.
- iv) The consultants will provide support to Government of the Punjab in overall project management activities such as monitoring of project implementation plans, expenditure planning budgeting and financing forecast and plans, monthly, quarterly and annual reports or work programs as required by the Government of Punjab and financiers of the project. The monitoring and evaluation plans will be updated on a regular basis as required by the client.
- v) The M&E consultants will further expand the already developed computer based state-of-the-art PMIS to monitor key performance indicators, visualization and production of useful reports, and track the project achievements as per planned targets.
- vi) The Consultant will provide support to manage the project activities in accordance with the modern concept of project management and track key project performance indicators through already developed user-friendly web-based PMIS. The M&E consultants will be responsible to provide training to the Directorate General Agriculture (Water Management)'s staff for use of the modernised versions. The Consultants will be responsible for sustainable operation of the PMIS during project period and will handed over the same to client in an orderly manner on project completion.
- vii) The M&EC will continue to maintain the PMIS hardware (health and compatibility) and software security against hacking, viral infections, etc.

Task-2: Monitoring and Evaluation

- i) Provide technical assistance to Director General Agriculture (WM) Punjab for achievement of project development objectives.
- ii) Implement the overall monitoring and evaluation plan including collecting, analyzing, and reporting project data for continual effective tracking of project development objectives.
- iii) Evaluate the key performance indicators and means of assessment for project activities.
- iv) Propose recommendations about project modalities to ensure achievement of envisaged development objectives.
- v) Contribute in development of Annual Work Plan, ensuring alignment with project

strategy, agreement on annual targets and inclusion of M&E activities in the work plan ensuring linkage with the work accomplished during the first phase of the PIPIP.

- vi) Oversee and execute M&E activities of water management practices and techniques with particular focus on results and impacts as well as in lesson learning.
- vii) Review the already developed formats (including documentation, surveys, data analysis, photographs, and interviews) to refine for the Completion Report.
- viii) Any other duty assigned by the Client.

3.1 The M&E Consultants would be engaged for following assignments to provide requisite consultancy services.

- **Assignment-A:** Consultancy services for project activities to be carried out within original/ existing IDA credit upto 31st December 2019.
- **Assignment-B:** Consultancy services for project activities to be carried out within IDA credit/ IBRD loan under Additional Financing to the PIPIP till 30th June 2021

3.2 The M&E consultants will check the quality of procured material during monitoring of different project and shall ensure the procurement of goods, services, civil works is in accordance with the project criteria and standard.

3.3 In the event of dispute which may result in legal action, adjudication or arbitration between the contract/supplier and the PISC on the instruction of the Client, the M&E consultants will continue to assist the Client to prepare factual documents which will describe the circumstances of dispute.

4. Time Duration for Proposed Consultancy: The gestation period of original project is five years (2012-13 to 2016-17) which is planned to be extended for four years (2017-18 to 2020-21). As such, the estimated duration of the consultancy services for extended period is four years i.e. 2017-18 to 2020-21.

5. Core Team of Experts

5.1 The consultants are encouraged to use the international expertise available to the extent possible. However, experience of the World Bank financed projects are necessary to carry out the assignment. The consultants are free to propose a staffing plan and skill mix in order to ensure that necessary requisite objectives and scope of services are achieved as planned for the revised PIPIP. If all the required skills are not available within the consulting firms, they are encouraged to make joint ventures with other firms. The Consultants shall ensure deployment of qualified competent staff to monitor and evaluate project impacts as well as to provide technical assistance etc. for successful accomplishment of envisaged PDO. The team of experts required for the project Monitoring & Evaluation will have sufficient experience of the related activities preferably in developed countries on successful models for promoting modern water management interventions, particularly high efficiency irrigation systems under on-farm water management projects.

5.2 Following is the indicative core team of experts, Technical Support Staff and Technical Field Staff along with minimum academic qualification, experience and input required for the PIPIP-revised.

Sr. #	Position	Qualification	General / Overall Experience (Years)	Job Specific Experience (Years)	Total Tentative Man Month	Tentative Man-months	
A. Key Staff						Assign. A	Assign. B
1.	Project Coordinator/ Irrigation Expert (1 No.)	M.Sc. degree in Agricultural Engineering/ Water Resources/ Irrigation Engineering or its equivalent	15	10 (On Farm Water Management including 03 years of High Efficiency Irrigation)	48	20	28
2.	Agricultural Economist (1 No.)	M.Sc. degree in Economics/ Agricultural Economics/ Development Economics	15	10 (On Farm Water Management)	24	10	14
3.	Irrigation Agronomist (1 No.)	Ph.D./ M.Sc. degree in Agriculture/ Agricultural Engineering/ Water Resources/ Irrigation Engineering or its equivalent with specialization in Agronomy	10	7 (Irrigation Agronomy/On Farm Water Management including 02 years of High Efficiency Irrigation)	24	10	14
4.	HEIS Specialist (1 No.)	M.Sc. degree in Agricultural Engineering/ Water Resources/ Irrigation Engineering or its equivalent	6	5 (On Farm Water Management including 03 years of High Efficiency Irrigation)	48	20	28
5.	Environmental Specialist (1 No.)	M.Sc. degree in Environment/Water Resources or its equivalent	10	5 (On Farm Water Management including 03 years of High Efficiency Irrigation)	12	4	8
6.	Field Coordinator (1 No.)	B.Sc. Agricultural/ Civil Engineering or Equivalent	15	10 (On Farm Water Management)	48	20	28
7.	Sociologist (1 No.)	M.Sc. degree in Social Sciences/Ruler Sociology or its Equivalent	10	5 (Agriculture related Project including 02 year on Farm Water management)	12	4	8
8.	Agricultural Engineer/Field Engineer (3 Nos)	M.Sc./B.Sc. degree in Agricultural/ Water Resources Engineering or Equivalent	5	3 (On Farm Water Management/ High Efficiency Irrigation)	144	60	84
9.	Assistant Agronomist (1 No.)	M.Sc. degree in Agronomy/ Agricultural Engineering/ or its equivalent	7	5 (Agronomy /On Farm Water Management/ Irrigation Agronomy)	48	20	28
10.	Jr. Agronomist (3 Nos.)	M.Sc./B.Sc. degree in Agronomy/ Irrigation Agronomy or its Equivalent	5	2 (Irrigation Agronomy/On Farm Water Management)	144	60	84
11.	MIS Specialist (1 No.)	M.Sc. degree in Computer Sciences or its equivalent	10	5 (Computer Sciences and Project Management Information System)	24	10	14
Total					576	238	338

Note: The client has the right to increase/ decrease the input of any experts as and when required.

Core Team of Experts required for the PIPIP is given as under.

i. Project Coordinator/ Irrigation Expert

Qualifications: The Project Coordinator/ Irrigation Expert will act as the Team Leader of consultant's team who shall be responsible for providing guidance and direction to all the team members for providing technical assistance about appropriate water management interventions

and will provide requisite technical support in their adoption. The Project Coordinator/ Irrigation Expert will possess a Master's degree or its equivalent in Agricultural Engineering / Water Resources / Irrigation Engineering after B.Sc. Agri. Engineering with 15 years' experience including evaluation of modern water management interventions of multi sectoral projects preferably World Bank financed. A minimum of 10 years of experience will be required for promoting on farm water management interventions including three (3) years of high efficiency irrigation systems in a developed country on successful model with demonstrated ability to work with government officials, technical field staff, NGO representatives, and farmers will be preferred. In addition, the Project Coordinator/ Irrigation Expert would be required to have familiarity with the principles and practices of participatory community development, irrigated agriculture, water management related issues, besides, having fluency in spoken and written English.

Responsibilities of the Project Coordinator/ Irrigation Expert will be but not limited to the following:

- i. Lead the M&E consultant's team for provision of technical assistance to Director General Agriculture (WM) in the Punjab.
- ii. Identify the most suitable new water management interventions from all over the World replicable in the Punjab.
- iii. Supervise preparation of implementation plans for M&E and impact assessment activities.
- iv. Assist in establishment of Irrigation Demonstration Sites (IDSs) for showcasing improved water management and conservation techniques/technologies.
- v. Identify the most efficient and cost effective tools and techniques for planning irrigation scheduling at the farmers' field.
- vi. Provide technical assistance in estimating crop water requirements of major crops and compare those with water availability for planning what to grow and how.
- vii. Design sustainable irrigation water management packages at the farm level and facilitate their demonstrations.
- viii. Guide the OFWM staff in identification and selection of appropriate irrigation methods for various areas.
- ix. Prepare/ improve technical reports, guidelines and training manuals to disseminate the latest OFWM information among stakeholders for adoption/promotion of improved water management interventions.
- x. Support in training of technical staff and master trainers involved in promotion of water management technologies.
- xi. Carry out monitoring and evaluation of improved water management practices and techniques for their performance assessment as well as propose measures for improving their efficiency.
- xii. Locate successful models of water management in developed countries and arrange technology transfer through foreign visits/trainings.
- xiii. Provide technical assistance to field staff for extending back up support to farmers about HEIS and new water management interventions

- xiv. Address issues and suggest solution to the problems related to engineering aspects of irrigation methods as confronted by the farmers.
- xv. Lead for demonstration, evaluation and indigenization of improved water management techniques/technologies under local conditions for their adoption by the farmer.
- xvi. Any other relevant duties assigned by the project management

ii. Irrigation Agronomist

Qualifications: The Irrigation Agronomist (IA) will possess a PhD/ M.Sc. degree in Agriculture with specialization in Agronomy and 10 years work experience including at least seven (7) year work experience in agronomy and on farm water management preferably adoption/promotion of modern water management interventions with sound knowledge of crop production technologies, particularly with improved and modern irrigation methods. A minimum of two (2) years of work experience in a developed country on successful model for promoting water management interventions, particularly high efficiency irrigation would be preferred. In addition, the IA would be required to have demonstrated ability to work with government officials, technical field staff, NGO representatives, and farmers and work experience in related computer tools, good communication skills, fluency in English and proven satisfactory record of similar consultancies would be preferred.

Responsibilities of the Irrigation Agronomist will be but not limited to the following:

- i. Provide technical assistance to Director General Agriculture (WM) for planning agronomic water management practices.
- ii. Develop/ refine irrigation schedules to meet water requirement of various crops under local conditions.
- iii. Formulate/ improve guidelines and technical manuals for OFWM professionals and farmers about agronomic aspects of water management and conservation techniques/technologies.
- iv. Identify, and recommend water efficient crop varieties based on soil and climatic conditions of the area.
- v. Recommend plans for successful crop production including land preparation, planting, irrigation scheduling, inter-culture, fertigation, harvesting, processing and marketing, etc. under new water management interventions particularly HEIS.
- vi. Provide agronomic support for training of technical staff and trainers involved in promotion of envisaged project interventions.
- vii. Address issues and suggest solution to the problems related to crop production as confronted by the farmers.
- viii. Provide support to WMT&R Institute in designing/laying out of agronomic experiments as well as data collection for proper evaluation.
- ix. Formulate guidelines about agronomic practices for farmers to improve water productivity and enhance production of various crops.
- x. Any other relevant duties assigned by the project management.

iii. Agricultural Economist

Qualifications: The Agricultural Economist will possess a Master's degree in Economics/ Agricultural Economics/ Development Economics with specialization preferably in Monitoring & Evaluation and 15 years of work experience including at least 10 years in implementation of water management projects at field level in agricultural and rural development sectors. The work experience in a developed country in related field particularly high efficiency irrigation and demonstrated ability to work with government officials, technical field staff, NGO representatives, and farmers would be preferred. Work experience in related computer tools, World Bank rules/procedures, good communication skills, fluency in English, and proven satisfactory record of similar consultancies would be preferred. Responsibilities of the Training Specialist will be but not limited to the following:

- i. Prepare/refine formats for baseline and periodic surveys for establishing pre-project dataset as well as for capturing temporal changes.
- ii. Lead the field staff in collection of periodic/seasonal data planning field activities, project review, impact assessment etc.
- iii. Collect, compile and analyze the data regarding different components/activities against envisaged project objectives
- iv. Assist in modification of project implementation plans on the basis of the information collected from the field on different aspects
- v. Establish a framework for involving beneficiary communities in the M&E process and internalizing beneficiary feedback in project implementation path
- vi. Provide leadership in developing monitoring mechanisms/systems for quality control of civil works.
- vii. Impart guidance and training on M&E concepts and tools to project stakeholders
- viii. Lead surveys/information collection for impact assessment of project activities.
- ix. Supervise M&E staff for inspection of field activities for ensuring adoption of specified standards and specifications.
- x. Any other relevant duties assigned by the project management.

5. Deliverables with Timeline

4.1 Reporting: The consultant will prepare the following reports in English and provide the copies as per sub para 3.6.1 regarding Deliverables and Schedule, along with respective soft copy:

- Revised inception report;
- Monthly Progress reports;
- A mid-term report on the format acceptable to the Client;
- Completion Report; and
- Any special reports as may be necessary from time to time for specific item / issue within the scope of the assignment.

4.2 Deliverables & Schedule: The schedule for various reports the consultants are likely to

prepare is given below. Additional, reports have to be prepared as needed. The consultants will supply the deliverables as per schedule given below:

Sr. #	Document	Copies	Due
1.	Draft Inception Report	5	3 weeks days after the effectiveness of the Consulting Services Agreement
2.	Final Inception Report	15	One week after the issuance of comments by the client on draft Inception report
3.	Monthly Progress Report (Physical)	10	10 th of the following month
4.	Quarterly Progress Report (Physical & Financial)	10	10 th of the first month of following quarter
5.	Annual Summary Progress Report (Physical & Financial)	10	10 th of the first month of following year
6.	Annual Progress Report (Physical & Financial)	10	During first month of the following year
7.	Quality Control / Assurance Report	10	After each year
8.	Draft Assignment Completion Report	5	At completion of physical works/activities
9.	Final Assignment Completion Report	25	At completion of works as well as financial transactions
10.	Complete inventory of works/activities completed	10	At completion of the project
11.	Impact Assessment Report	10	After every 6 Month
12.	Special Reports	10	As and when required

6. Professional Liability of the consultant

The consultants would be responsible for professional liability as per World Bank guidelines for recruitment of consultants as well as may also cover

- i) The Consultants selected and awarded the contract will be liable for the consequence of errors and omissions on their part or on the part of their employees.
- ii) The consultant shall be held liable for all losses or damages suffered by the procuring agency on account of any misconduct by the consultant in performing the consulting services.
- iii) The extent of liability of the consultant shall form part of the contract and such liability shall be in accordance with the relevant World Bank guidelines.
- iv) The consultants would also be liable for the consequences as per provisions contained in bye-laws of Pakistan Engineering Council for “Conduct and Practice of Consulting Engineers”.
- v) The consultants will provide insurance for liabilities on part of the consultant @ 10 percent of contract cost and necessary costs shall be borne by the consultants in this regard.
- vi) Consultants will not engage any person, who is paid employee of another consulting firm, works part-time in its offices or performs any piece of work or work on contract, until they have not obtained permission in writing of the Consultants who are the employer of such person.

- vii) Consultants shall not make any offer of employment to employees of their Client and if they are approached by employees of their Client regarding employment with them, they shall make certain that they have their Client's consent before entering into any negotiations with such employees.
- viii) In case of any dispute between the consultants and Client, the matter shall be referred to the competent authority for arbitration as per Rules. The decision of the arbitrator shall be final and non-appealable.