



# Water saving in agriculture



## MONTHLY MONITORING REPORT FEBRUARY 2021

### WATER CONSERVATION IN BARANI AREAS OF KHYBER PAKHTUNKHWA (WC-KP)

### MONITORING, EVALUATION AND IMPACT EVALUATION (ME&IE) CONSULTANTS

A Joint Venture of  
**G3 Engineering Consultants (Pvt.) Ltd.**





**Federal Project Management Unit (FPMU)  
Federal Water Management Cell (FWMC)  
Ministry of National Food Security & Research, Islamabad**

**Monitoring, Evaluation and Impact Evaluation (ME&IE) Consultants  
For  
Water Conservation in Barani Areas of Khyber Pakhtunkhwa**

**MONTHLY MONITORING REPORT  
FEBRUARY 2021**

**CONTENTS**

<b>EXECUTIVE SUMMARY .....</b>	<b>1</b>
<b>1      INTRODUCTION TO WATER CONSERVATION IN BARANI AREA .....</b>	<b>3</b>
1.1     INTRODUCTION.....	3
1.2     BACKGROUND OF WCBAKP .....	3
1.2.1    Project Objectives .....	4
1.2.2    Description of Sub-Components .....	4
1.2.2.1    Component-A.....	4
1.3     PROJECT TARGETS AND OUTPUTS .....	5
<b>2      SCOPE AND SERVICES OF ME&amp;IE CONSULTANTS .....</b>	<b>6</b>
2.1     ACTIVITIES OF THE ME&IE CONSULTANTS.....	6
<b>3      MOBILIZATION OF ME&amp;IE CONSULTANT' TEAMS .....</b>	<b>6</b>
3.1     MOBILIZATION OF ME&IE CONSULTANTS' CORE TEAM .....	6
3.2     MOBILIZATION OF DISTRICT TEAMS .....	7
3.3     ESTABLISHMENT OF ME&IE CONSULTANT OFFICES .....	7
<b>4      CONSULTANTS' APPROACH AND METHODOLOGY FOR ME&amp;IE .....</b>	<b>8</b>
4.1     BASICS OF ME&IE SYSTEM .....	8
4.2     PARTICIPATORY DESIGN OF THE MIS/GIS ACTIVITIES.....	9
4.3     MONITORING, EVALUATION AND IMPACT EVALUATION PLAN .....	9
4.3.1    Introduction .....	9
4.3.2    Framework for ME&IE System.....	9
4.3.3    Monitoring and Managing of Project Progress .....	10
4.3.4    Project Progress Reporting Framework (PPRF).....	10
4.3.5    Evaluation: An Assessment of Results .....	11

4.3.6	Impact: Quantification of Tangible Benefits and Assessment on Intangible Benefits of Project Interventions/Investment.....	11
4.3.7	Design and Development of ME&IE GIS Based Information System .....	11
4.3.8	Regular Routine Monitoring .....	12
<b>5</b>	<b>MONTHLY MONITORING REPORT.....</b>	<b>13</b>
5.1	INTRODUCTION.....	13
5.2	OBJECTIVE OF MONTHLY MONITORING REPORT .....	13
5.3	REPORTING PERIOD .....	14
5.3.1	Establishment of ME&IE (Consultants) Office at Peshawar:.....	14
5.4	MOBILIZATION OF ME&IE CONSULTANT:.....	14
5.5	DRAFT INCEPTION REPORT .....	15
5.6	PREPARATION OF MONITORING TOOLS (Field Survey Questionnaires) .....	15
5.7	PREPARATION OF ANDROID BASED APPLICATION FOR FIELD SURVEY.....	15
5.8	DEVELOPMENT OF MIS/GIS SYSTEM .....	15
5.9	DEVELOPMENT OF WEBSITE FOR THE PROJECT .....	15
5.10	WORK SCHEDULE AND PLANNING FOR DELIVERABLE.....	16

## LIST OF ANNEXES

ANNEX-A: Project Progress Reporting Framework (PPRF) .....	18
ANNEX-B: Monitoring Log-frame.....	20
ANNEX-C: Work Schedule and Planning for Deliverables .....	28

## LIST OF TABLES

Table 1.1. Activities under Component A Executed by the Directorate General Soil & Water Conservation KP .....	4
Table 1.2. Project Targets and Outputs.....	5
Table 3.1: Team & Planned Time Input (Key Staff) .....	6
Table 3.2: Core Team & Planned Time Input (Non-Key Staff) .....	6

## LIST OF FIGURES

Figure-3.1. The Organogram of the Core Team .....	7
---	---

## ACRONYMS

ADA	Assistant Director Agriculture
AF	Acre-Feet
AJK	Azad Jammu & Kashmir
ALCI	Agronomic Low-Cost Interventions
AWPB	Annual Work Plan and Budget
AWPs	Annual Work Plans
BCR	Benefit Cost Ratio
CB	Capacity Building
CMS	Content Management System
CSRD	Center for Social Research and Development
DDA	Deputy Director Agriculture
DGW&SC	Directorate General of Water & Soil Conservations
EAs	Executing Agencies
EIRR	Economic Internal Rate of Return
ES-QPR	Environmental and Social Quarterly Progress Reports
FCR	Financial Completion Report
FCRs	Final Completion Reports
FMFSR	Framework for Federal Financial Management System
FOs	Farmers Organizations
FPMU	Federal Project Management Unit
FWMC	Federal Water Management Cell
GAP	Gender Action Plan
GIS	Geographic Information System
GoP	Government of Pakistan
GoKP	Government of Khyber Pakhtunkhwa
HEIS	High Efficiency Irrigation System
IAs	Implementing Agencies
ICR	Intermediate Completion Report
ICT	Information & Communication Technology
IRR	Internal Rate of Return
KP	Khyber Pakhtunkhwa
LFT	Land for Terracing
LPS	Liter per Second
M&E	Monitoring and Evaluation
MAF	Million Acre Feet
ME&IE	Monitoring, Evaluation and Impact Evaluation
MIS	Management Information System
MNFSR	Ministry of National Food Security and Research
MT	Monitoring Template
MTE	Mid-Term Evaluation
MWA	Micro-Watershed Areas
NPC	National Project Coordinator
NPV	Net Present Value
OFWM	On Farm Water Management
PC	Project Consultants
PC-1	Planning Commission-(Form-One)

PDO	Project Development Objectives
PIC	Project Implementation Committee
PIES	Project Impact Evaluation Study
PPRF	Project Progress Reporting Framework (PPRF)
PQC	Pre-Qualification Committee
RBM	Results-Based Management
RWD	Responsive Web Design
SBS	Stream Bank Stabilization
SDS	Sand Dunes Stabilization
SOPs	Standardized Operating Procedures
SPS&TW	Solar, Pumping System and Tube Wells
SPSS	Statistical Package for Social Sciences (Software)
SSCs	Supply and Service Companies
TABs	Tablets
TOR	Terms of Reference
TPV	Third Party Validation
TWRD	Tail-Water Recovery Ditch
WCA	Water Conservation Activity
WCBAKP	Water Conservation in Barani Areas of Khyber Pakhtunkhwa
WG	Women Group
WR	Water Reservoir
WSHG	Water Seepage Harvesting Galleries
WSP	Water Storage Pound

## EXECUTIVE SUMMARY

Khyber Pakhtunkhwa (KP), formerly known as the North-West Frontier Province, is one of the four provinces of Pakistan. It is located in the northwestern region of the country, along the Afghanistan–Pakistan border. The economy of KP is agrarian in nature where 80% of the total population is rural, with agriculture as their major source of livelihoods. Agriculture contributes 22% to the provincial GDP and provides employment to 44% of the labor force. Water is the limiting factor in the rain-fed Districts of KP that hinders the production of crops and adversely affects human and animal life. Precipitation received through the mountains of the region drains out of the watershed quickly because of the undulating topography; the uneven terrain of the foothills which drain the areas quickly. Hence enormous amounts of valuable water are being lost through runoff without being utilized and also carries with it fertile top-soil. The runoff water, if harvested and stored in small units at local level, can be used to supplement irrigation for increase in agriculture production, stabilize the ground water table by inducing ground water recharge, can be used for human and animal use and improve climatic conditions of the rain-fed areas.

The conservation of these vital resources is a need of the hour to ensure sustainable high level crop

production for food security and safeguarding the socio-economic status of the farming community of Province KP. Government realized that best solution to the problem of water scarcity in the rain fed areas of KP is the harvesting of rain/runoff/ spring water at the local level; on-farm or in the immediate vicinity of the farmland. The water can be harvested in water ponds (earthen in low lying area while cemented in sloped/ terraced mountainous areas), earthen water reservoirs, mini dams, sailaba water harvesting through field inlets/spillways in the rod kohi areas of southern KP check dams in the gullied lands for land reclamation and ground water recharge, sand dunes stabilization in the arid southern regions of the province, terracing for moisture conservation in hilly tracts and stream bank stabilization for protection of prime agriculture lands along the bank of water channels and micro-watershed demonstration sites. To mitigate this problem Executive Committee of National Economic Council (ECNEC) approved a project this project “Water Conservation in Barani Areas of KP” on August 29, 2019 at a cost of Rs. 14.177 billion at 80:20 cost sharing between Government and the beneficiaries / farmers. The implementation period of the project is 60 months. The aim of the project is to conserve water in Barani Areas of KP through listed below interventions.

S.#	Interventions	S.#	Interventions
1.	Construction of 5,000 water ponds	8.	Constructing 370 numbers of water Seepage harvesting Galleries
2.	Construction of 3,000 Check dams	9.	800 numbers of Agronomic low-cost interventions
3.	Construction of 330 Water Reservoir	10.	230 acres of Sand Dunes stabilization
4.	Construction of 2,500 Stream bank stabilization.	11.	500 Nos. Capacity Building
5.	Construction of 1,000 Gated field Inlet Outlet/Spillway	12.	Procurement and installation of 700 Solar, pumping System and 300 Tube Wells.
6.	Development of 370 acres land for terracing	13.	700 on-site training of farmers in adaptation of new techniques for pumping sub-surface water.
7.	Development of 70 numbers of micro-watershed areas		

To evaluate the impact of this project Government has engaged Consultants “Monitoring, Evaluation and Impact Evaluation (ME&IE) Consultants” through Federal Project Management Unit (FPMU) Federal Water Management Cell, Ministry of National Food Security & Research, Islamabad.

The project was signed by the G3 – Joint Venture with the Government of Pakistan on November 27, 2021. While the Team Leader Monitoring, Evaluation and Impact Evaluation (ME&IE) Consultant joined the project on December 15, 2021.

Listed below activities were carried out during the reporting period:

- Submitted comments on the final draft report of Water Conservation in Barani Areas of Khyber Pakhtunkhwa (WCBAKP),
- The ME&IE Consultants remained engaged in reviewing the secondary available data and reports.
- The Monitoring Log Frame of the project was finalized.
- Prepared and submitted the draft Inception Report.
- Development of Android based application for field Survey remained in progress.
- Development of Project MIS/GIS system remained in progress.
- Development of Project Website remained in progress.
- Work Schedule and Planning for deliverable of the project finalized.

## 1 INTRODUCTION TO WATER CONSERVATION IN BARANI AREA

This section of the Monthly Monitoring Report includes brief introduction to Water Conservation in Barani Area and background of Water Conservation in Barani Area of Khyber Pakhtunkhwa (WCBAKP)

### 1.1 INTRODUCTION

A dry, barren, often sand covered area of land is waterless and without vegetation cover. The common features of such land are; low precipitation, high temperature, high evaporation, low humidity, poor rain water efficiency, water percolation and low productivity. These lands are called Barani and Arid lands but still are not considered wastelands as these can be used for cultivation and crop production through soil and water conservation activities. For this purpose Govt. of Pakistan has established Soil & Water Conservation Department. Soil and water conservation services to the farmers for agricultural purpose are provided through district governments. Practically the main tasks of Soil & Water Conservation which are considered important are listed below:

- To contain soil erosion process in the cultivable area and the adjoining uncultivated lands and to save these areas from further degradation.
- To make maximum use of run-off water by conserving it into the field by various moisture conservation measures.
- To bring more area under cultivation through reclamation and gully control techniques.
- Exploitation of water resource through various means of providing assured water supply for irrigation purposes (mini dams and ponds)

Some of the works being undertaken for soil and water conservation purpose are;

- Construction of Mini Dams
- Water Storage Tanks
- Construction of Water Outlet Structures
- Retaining Walls
- Land Reclamation through Gully Plugging
- Stream Bank Training
- Moisture Conservation Practices such as Terrace Forming & Deep Ploughing.

## 1.2 BACKGROUND OF WCBAKP

Khyber Pakhtunkhwa (KP) borders the mountainous regions except to the South-East portion of the province. Therefore geographically the province is intertwined with various rivers, floods waterways and hill torrent runoff water resources. Water is the limiting factor in the rain- fed Districts of KP that hinder the production of crops and adversely affects human and animal life. Precipitation received through these mountains of the region drains out of the watershed quickly because of the undulating topography; the uneven terrain of the foothills which drain the areas quickly. Hence enormous amounts of water are being lost through runoff without being utilized, carrying with it fertile top-soil. These waters induce flash floods on one hand and decrease the storage capacity of the dams due to siltation, on the other. The runoff water, if harvested and stored in small units at local level, can be used to supplement irrigation for increase in agriculture production, stabilize the ground water table by inducing ground water recharge, can be used for human and animal use and improve climatic conditions of the rain- fed areas.

While the plains of Peshawar valley (comprising of district Peshawar, Charsadda, Mardan, Swabi and Nowshera) is irrigated by the river Kabul and its tributaries, D.I. Khan which are being irrigated through the CRBC canal from the Indus and steps being taken for Gomal Zam dam, majority of the agriculture lands of the province need to be supplemented through local water harvesting because of the uneven terrain.

In relation to the scope of the problem and the opportunity at hand, previously the idea of conversion of rain fed agriculture to irrigated agriculture have not been taken as it should have been. The conservation of these vital resources is a need of the hour to ensure sustainable high level crop production for food security and safeguarding the socio-economic status of the farming community of Province Khyber Pakhtunkhwa.

The runoff water, if harvested and stored in small units at local level, can be used to supplement irrigation for increase in agriculture production, stabilize the ground water table by inducing ground water recharge, can be used for human and animal use and improve climatic conditions of the rain-fed areas.

The Directorate General Soil & Water Conservation Khyber Pakhtunkhwa is functional in 24 Districts of

the province and is striving for the protection and conservation of agricultural lands and rain water through conservation structures like Inlet and outlet structures, field spillways, cemented water storage ponds, Spurs and protection bunds/walls cemented, G.I. wire spurs and protection bunds, runoff diversion structures and source development, rain fed water retention reservoirs, earthen ponds and earthen embankments, contours and terraces. In addition water harvesting interventions such as check dams, water reservoirs etc.

### 1.2.1 Project Objectives

The main objective of agriculture sector is to make the country self-sufficient in food grains and make raw material available for agro based industries. The project will be encouraging the farming community through financial assistance for water conservation for ensuring timely irrigation. The project has designed to achieve the following long-run objectives:

- *To conserve land and water resources through various interventions for supplemental irrigation, livestock, farm forestry and fish farming*
- *To increase cropping intensity and per unit of land and water productivity*
- *To improve livelihood standards of poor farmers*
- *To improve socio-economic stability*

The project objectives in quantifiable terms are as follows:

- i) To induce aquifer/ground water recharge by pumping water in > 300 water storage reservoirs.
- ii) To convert 15,032 acres of culturable wastelands into productive agriculture lands through development of 70 micro-watersheds.
- iii) To reduce soil erosion by containing flash floods through provision of soil & water conservation structures and check gully erosion by plugging

gullies through 3,000 check dams.

- iv) Minimize the adverse effects of drought by maximizing the irrigation water supplies through exploitation of sub-surface water from tube wells.
- v) Conversion of around 43,225 acres of rain fed land into irrigated land through installation of 300 agricultural tube wells and solarization of 700 existing/new tube wells.
- vi) To enhance the capacity of the stakeholders in water harvesting and for sustainable use of land and soil resources for increased agriculture production.
- vii) To improve the socio-economic status of the farmer community.

The project is in line with specific objectives of National Water Policy and Provincial Implementation Plan of the agriculture sector for enhancing water productivity, efficient and harvesting runoff water to ensure farm productivity, economic uplift of small farmers and improving economy of the country as a whole. The proposed project is closely related to the recently completed water conservation schemes, which form an important element of the integrated rural development program within the agriculture sector.

### 1.2.2 Description of Sub-Components

The project have two components; Component-A & B.

- *Component-A*
- *Component-B*

#### 1.2.2.1 Component-A

Component-A is being executed by the Directorate General Soil & Water Conservation KP through its provincial setup. It comprises the following activities (Table 1.1):

**Table 0.1. Activities under Component A Executed by the Directorate General Soil & Water Conservation KP**

Sr. No.	Name of Activity	Sr. No.	Name of Activity
1.	Water Ponds	2.	Check Dams
3.	Water Reservoir	4.	Stream-bank stabilization
5.	Gated field Inlet Outlet/ Spillway	6.	Terracing
7.	Micro-Watershed Development	8.	Water Seepage harvesting Galleries
9.	Agronomic low-cost interventions	10.	Sand Dunes stabilization
11.	Capacity Building		

### 1.3 PROJECT TARGETS AND OUTPUTS

Project targets and outputs of both components are presented at Table 1.2.

**Table 0.2. Project Targets and Outputs**

S.#	Input	Output
1.	Construction of 5,000 water ponds	Approximately 12,500 acres of agriculture land will be irrigated from these interventions.
2.	Construction of 3,000 Check dams	Approximately 7,500 acres of the land will be reclaimed.
3.	Construction of 330 Water Reservoir	Approximately 9,900 acres of land will be irrigated from this intervention.
4.	Construction of 2,500 Stream bank stabilization.	Protecting/ reclaiming about 6,250 acres of agricultural land from erosion with floods water.
5.	Construction of 1,000 Gated field Inlet Outlet/Spillway	Sufficient amount of water will be provided to about 2,500 acres of land for irrigation in rod kohi areas of the province.
6.	Development of 370 acres land for terracing	Farmer's income will be increased by increasing agricultural land due to terraces development.
7.	Development of 70 numbers of micro-watershed areas	Approx. 7,000 acres of the area will be converted into agriculture/ forest land which will improve the aesthetic value of the area.
8.	Constructing 370 numbers of water Seepage harvesting Galleries	Approx. 925 acres of land will be irrigated from this intervention.
9.	800 numbers of Agronomic low-cost interventions	Approx. 2000 acres of land will be protected from erosion by these interventions.
10.	230 acres of Sand Dunes stabilization	Approx. 230 acres land of sand dunes will be stabilized by growing kana plants.
11.	500 Nos Capacity Building	An estimated 500 trainings will be conducted for stakeholders including farmers and departmental staff.

#### Agricultural Engineering Component

12.	Procurement and installation of 700 Solar pumping System and 300 Tube Wells.	Irrigation of 17,500 hectares (43,225 acres) of land.
13.	700 on-site training of farmers in adaptation of new techniques for pumping sub-surface water.	Irrigation water Pumping cost will be reduced by adopting solar technology.

## 2 SCOPE AND SERVICES OF ME&IE CONSULTANTS

The scope of the ME&IE Consultants is as follow:

### 2.1 ACTIVITIES OF THE ME&IE CONSULTANTS

The assignment includes consultancy services for 5-year period. The ME&IE Consultants will be responsible for monitoring, evaluation and Impact Evaluation of the project interventions carried out by implementation Consultants and in this context will carry out, but not limited to the following activities:

- i) Undertake baseline, midline and end line surveys of the project activities/interventions in all the project areas.
- ii) Develop monitoring strategy, framework and Result Based Monitoring (RBM) indicators.
- iii) Preparation of Monthly, Quarterly and Annual Monitoring and Evaluation of the project activities.
- iv) Assessing the improvement in water availability and soil losses due to project interventions.
- v) Assessing the water saving per annum due to the project interventions.
- vi) Assessing the economic benefits to the agriculture in terms of changes in irrigated area, area under cultivation, crop yields, cropping pattern, cropping intensity, farm income and employment.
- vii) Assessing the extent of community mobilization, financial and administrative sustainability of Soil & Water Conservation Associations (SWCAs) and ensuring the maintenance of project interventions.
- viii) Carryout impact evaluation of the project investment on the economy and stakeholders.

Following specialist team members with planned time inputs have been mobilized.

**Table 3.1: Team & Planned Time Input (Key Staff)**

Sr. No.	Name	Position	Time Input (months)
1	Dr. Usman Mustafa	Team Leader / M&E Specialist	30
2	Dr. G.R. Kerio	Environment & Social Monitoring Specialist	12
3	Dr. Mansab Ali	Irrigation Agronomist	12
4	M. Akram Khan	Agricultural Economist	8
5	Afzal Hayat Khan	Social & Gender Specialist	8
<b>Total Man-months</b>			<b>70</b>

**Table 3.2: Core Team & Planned Time Input (Non-Key Staff)**

Sr. No.	Name	Position	Time Input (months)
1	Recruitment in progress	Un-allocated man-months	Misc.
2	Recruitment in progress	Other Supporting Technical and Non-Technical Staff	Various
<b>Total Man-months</b>			<b>165</b>

## 3 MOBILIZATION OF ME&IE CONSULTANT' TEAMS

The ME&IE Consultant Offices is already established, the detail of it is also discusses in the section.

### 3.1 MOBILIZATION OF ME&IE CONSULTANTS' CORE TEAM

The ME&IE Consultants mobilized its specialists (core) team on December 24, 2020. The list of key specialists is shown in Table-3.1(a) & Table-3.1(b). It is also depicted in Figure-3.1 organogram. The non-specialist but supporting staff recruitment is in progress and soon they will be mobilized as well.

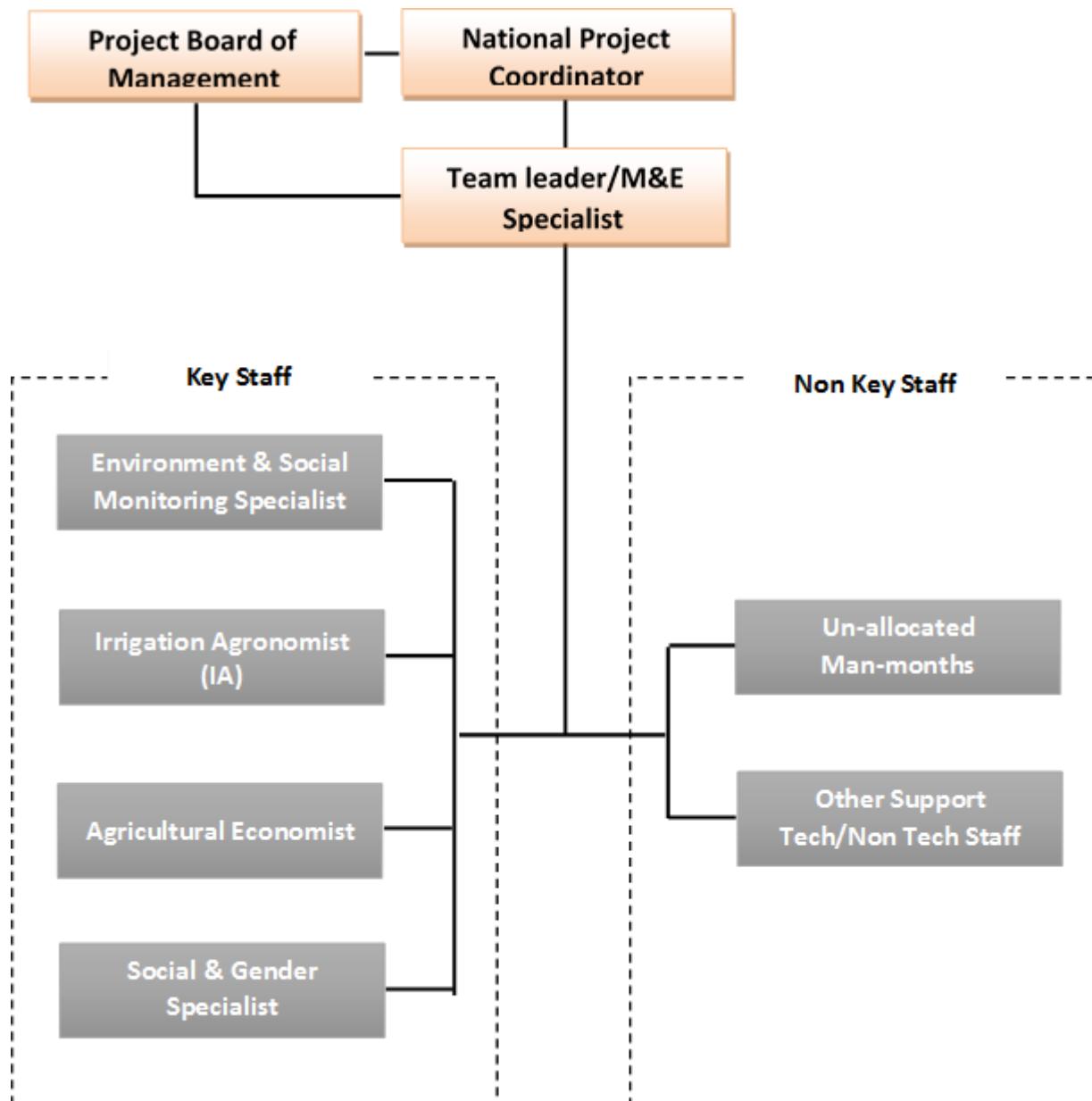


Figure-3.1. The Organogram of the Core Team

### 3.2 MOBILIZATION OF DISTRICT TEAMS

For conducting Baseline, Midline and End Line Survey field enumerators will be selected and moved to selected sample district for survey. Before launching of the enumerators in to field special training will be conducted. In this connection questionnaires will be prepared and pretested.

### 3.3 ESTABLISHMENT OF ME&IE CONSULTANT OFFICES

The building for the office is hired in University Town, Peshawar. Following is the address of the office:

House No. 358, Khyber Colony No. 2, Tahkal Payan, University Road, Peshawar

## 4 CONSULTANTS' APPROACH AND METHODOLOGY FOR ME&IE

The section briefly discusses the basic of ME&IE system.

### 4.1 BASICS OF ME&IE SYSTEM

The ME&IE at WCBAKP Project is grounded in Results-Based Management (RBM), which is a management strategy focusing on the performance and achievement of results in terms of outputs, outcomes and impacts. It is a tool used for strategic control. It uses feedback loops to help managers monitor and then (hopefully) achieve strategic goals. These goals may take the form of physical outputs, organizational or behavioral changes, workflow changes, or form contribution to some other higher level goal. A key function of ME&IE is therefore to test and determine whether or not the project's objectives and causal analysis (i.e., the sequence of results expected based on certain inputs and

activities) articulated in the project design holds true; and if not, why not, and what should be done to address this and learn lessons.

The ME&IE systems at WCBAKP are formulated based upon the project's logical framework (log-frame), which is one type of program logic model. A log-frame is an important tool in project design and management, mapping the multiple levels of objectives and associated results (measured through indicators) in the short, medium, and long term. Indicators are units of measurement in the form of qualitative and quantitative that determine whether the objectives formulated in the log-frame have been achieved (log-frame developed WCBAKP is placed at [Annex-A](#).)

The matrix in Table 4.1 summarizes standard log-frame objectives and results, and the types of indicators used to measure them, which form the basis of a project ME&IE system and plan.

**Table 4. Matrix for Levels of Log-frame Objectives and Indicators**

Log-frame objectives definitions		Objectively verifiable indicators that measure objectives	
<b>Impact (Goal/Overall Objective)</b>	Higher level project objectives in terms of long-term benefits to beneficiaries and the wider benefits to society. The goal will not be achieved by the project alone. The project aims to contribute to its goal.	<b>Project impact indicators</b>	Impact indicators measure this long-term change in conditions of the community (e.g., % change in household income, reduction in poverty, etc.)
<b>Outcome (Purpose Specific Objective)</b>	The short term and medium-term objectives in terms of benefits to the project beneficiaries due to the intervention's outputs; the project can only indirectly control achievement of outcomes; behavior change is often a key component.	<b>Outcome indicators</b>	Outcome indicators describe the medium-term effects of an intervention's outputs (e.g., % change in cropping pattern and intensities, crop yields etc.)
<b>Output (Results)</b>	The output produced by undertaking a series of activities. This is what will be achieved to the intended beneficiaries or target group, and it should be possible for project management to be held accountable for this delivery	<b>Output (indicators)</b>	Output indicators describe the immediate effects of an activity, tangible products, goods and services, and other immediate changes that lead to the achievement of outcomes (e.g., number of WSPs, Check dams, WR, SBS, Solar TW, etc.).
<b>Activities</b>	The tangible goods and services delivered by the project (e.g., provision of material inputs, staff, etc.)	<b>Process indicators</b>	Process indicators describe the activities undertaken (e.g., process of WSPs, Check dams, WR, SBS, Solar TW, etc.), process of delivering these activities.

Log-frame objectives definitions		Objectively verifiable indicators that measure objectives	
Inputs	The financial, human, and material resources used for the development intervention	Input indicators	Indicators used to measure the utilization of inputs (e.g., utilization of budget, and services of project staff, labour by the communities)
<p>To minimize the complexities and make the MIS/GIS Database a useful tool for Input-output, process and result monitoring, the consultants adopt the following key principles and guidelines during the development and implementation of WCBAKP MIS/GIS Database:</p> <ul style="list-style-type: none"> <li>i) Information needs and indicators to capture such information are identified in a participatory manner involving all key stakeholders of the project at all levels;</li> <li>ii) The potential users of MIS/GIS Database are convinced and understand the usefulness of the MIS/GIS Database and their role in data collection, recording, transmission and use of information;</li> <li>iii) The system provides a two-way flow of information, such that those who collect and transmit the information receive the feedback;</li> <li>iv) The MIS/GIS Database does not impose a high work load at any level in PIU and other Implementing Agencies (IAs);</li> <li>v) There is no information/data 'overload' at any level;</li> <li>vi) The system is flexible enough to accommodate internal learning changes in future.</li> <li>vii) The system provides user friendly interfaces to interact with.</li> </ul>		<p>conducted to which the key partners would be invited in order to have real feedback on the proposals and achievements.</p>	

- i) Information needs and indicators to capture such information are identified in a participatory manner involving all key stakeholders of the project at all levels;
- ii) The potential users of MIS/GIS Database are convinced and understand the usefulness of the MIS/GIS Database and their role in data collection, recording, transmission and use of information;
- iii) The system provides a two-way flow of information, such that those who collect and transmit the information receive the feedback;
- iv) The MIS/GIS Database does not impose a high work load at any level in PIU and other Implementing Agencies (IAs);
- v) There is no information/data 'overload' at any level;
- vi) The system is flexible enough to accommodate internal learning changes in future.
- vii) The system provides user friendly interfaces to interact with.

The system's outputs are presented in formats that can be easily converted to other formats and data types without human intervention.

## 4.2 PARTICIPATORY DESIGN OF THE MIS/GIS ACTIVITIES

The proposed approach to design the MIS/GIS is fully participative. Great efforts are made to ensure that all key stakeholders are fully involved throughout the ME&IE design and implementation process.

Before launching the MIS/GIS database system, multiple feedback and validation sessions are in progress with all the stakeholders. Finally, a restitution / validation workshop will be

conducted to which the key partners would be invited in order to have real feedback on the proposals and achievements.

## 4.3 MONITORING, EVALUATION AND IMPACT EVALUATION PLAN

This section presents brief introduction about the ME&IE and Impact evaluation plan.

### 4.3.1 Introduction

The monitoring and evaluation functions are related but distinct. Monitoring is the provision of information, and the use of that information, to enable management to assess progress of implementation and take timely decisions to ensure that progress is maintained according to schedule. Monitoring assesses whether project inputs are being delivered, are being used as intended, and are having the initial effects as planned. It is an internal project activity, an essential part of good management practice and therefore an integral part of day-to-day management. Whereas, evaluation assesses the overall project effects, both intentional and unintentional and their impact. It involves comparisons requiring information from outside the project either in time, area, or population. The relative roles of monitoring and evaluation varies with the type of project.

### 4.3.2 Framework for ME&IE System

The initial steps for designing monitoring and evaluation system are:

- i) A review of the project objectives in order to systematize them in sequence.
- ii) Identification of the users of both the monitoring and evaluation information. For monitoring, the users will be the hierarchy of project management. The type of information transmittal will be geared to the needs of each level of project management. The users of evaluation analysis range from project

management through the responsible directorate/ ministry, to the national planners.

Evaluation will be drawn on the data generated by the monitoring system to help explain the trends in effects and impact of the project. Monitoring data may reveal significant departure from expectations which may warrant the undertaking of an on-going evaluation exercise to examine the assumptions and premises on which the project design was based. Such a review, as also in the case of ex-post evaluation, can be of great value to sectoral management in its policy formulation role.

Monitoring has to be integrated within the project management structure but evaluation, with its wider horizons requiring comparative information, is not necessarily such an integral component. A central evaluation facility may be justified on the grounds that:

- i) The demanding professional skills required to interpret evaluation data are either unavailable or uneconomic for each project individually;
- ii) The data needed extend from before a project is initiated to a period long past its completion.

Although the design and analytical facility for evaluation may be centralized, the data collection resources within a project will be used to provide much of the required data. If the same unit is collecting data both for eventual evaluation and for quick, timely monitoring, the latter must not suffer due to the greater demands of the former.

#### 4.3.3 Monitoring and Managing of Project Progress

The primary goal is to monitor project progress, given that the project has been carefully appraised; i.e., that there is a strong assumption towards certain stimuli and inputs will achieve specific outputs, effects and its impact. The role of management in the initial implementation phase is to create the conditions that allows this chain of events to be occurred.

In the early years of project implementation, the emphasis will be on monitoring of project progress and the delivery of the inputs to the intended recipients. The main source for this aspect of monitoring is properly organized in project

records. The other concern of management, at this stage is to use these inputs and reaction of the recipients.

Adoption rates give management a strong inference whether the project is succeeding or not. Information on the recipients' attitudes and perception is important in order to explain any departure in response behavior to that postulated in the project design. Such unpredicted behavior may determine the success or failure of the project.

The information required for monitoring of project implementation does not require complex data systems. A monitoring system exists even if it is merely a subjective accumulation of impressions by project staff. If common sense rules of good standard management practices are adhered to, the monitoring system can be limited to the minimum of parameters to be recorded regularly over time. The goal is to make the data collection as objective as possible, and to ensure, above all, that the means exist for fast collation, summarization and presentation of the information to the decision makers.

Once management has satisfied itself that the delivery system is working, its attention should shift to the outputs generated; i.e., are they materializing according to expectation. Focus on output measurements must not, however, be at the expense of monitoring the input delivery system. The measurement of outputs is more properly a function of evaluation, for identifying trends is not an easy task in view of the exogenous influences at work, and is often impossible without an extended time series.

The key to successful monitoring is the provision of regular, timely, decision-oriented information to the project management. This can be achieved if the necessary staffs are in place early, are seen to be part of the management team, and are given guidance on the priority information needs of the management.

#### 4.3.4 Project Progress Reporting Framework (PPRF)

The Project Progress Reporting Framework (PPRF) placed at **Annex-A**, is a format for reporting summary

of physical and financial progress achieved during the period for various interventions. A regular flow of this data is expected from Clients'. Field Teams/Project Consultants. However, detailed data on the processes and beneficiaries' feedback will be gathered / transmitted through Android based application using smart phones.

#### 4.3.5 Evaluation: An Assessment of Results

Evaluation aims to determine whether the project objectives set in the ME&IE of expected outputs, effects and impact are being, or will be, met. This leads to an assessment of the results achieved, and the lessons to be drawn for future improvements in a later phase or in similar projects elsewhere.

Output levels are a measure of the result of the input utilization by the beneficiaries. If the changes in outputs are considerable, they may be detected even during the implementation phase of a project. An evaluation system requires the development of a series of data commencing before the project is implemented and continuing well past the completion of the implementation period. Unlike a monitoring system with its emphasis on rapid assessment, an evaluation system requires a longer time span before even tentative conclusions can be drawn.

#### 4.3.6 Impact: Quantification of Tangible Benefits and Assessment on Intangible Benefits of Project Interventions/Investment

In the ME&IE process, tangible benefits of agricultural projects can arise either from an increased value of production or from reduced costs. The specific forms, in which tangible benefits appear, however, are not always obvious, and valuing them may be quite difficult.

Increased physical production is the most common benefit of the agricultural sector. To maintain better water control so that farmers can obtain higher yields. The project makes resources available for farmers to increase both their operating expenditures for current production-for fertilizers, seeds, or pesticides-and their investment-for water conservations techniques and solar water tube wells. The benefit is the increased production from

the farm. In a large proportion of agricultural projects, the increased production will be marketed through commercial channels. In many agricultural projects, however, the benefits may well include increased production consumed by the farm family itself. The home-consumed production from the projects increased the farm families' net benefit and the national income just as much as if it had been sold in the market. Indeed, we could think of the hypothetical case of a farmer selling his output and then buying it back. Since home-consumed production contributes to project objectives in the same way as marketed production, it is clearly part of the project benefits in both financial and economic analysis.

#### 4.3.7 Design and Development of ME&IE GIS Based Information System

Management Information System (MIS) is the tools and techniques used in project management to deliver information. Project managers use the techniques and tools to collect, combine and distribute information through electronic and manual means. It is used by upper and lower management to communicate with each other.

The monitoring and evaluation functions are related but distinct. Monitoring is the provision of information, and the use of that information, to enable management to assess progress of implementation and take timely decisions to ensure that progress is maintained according to schedule. Monitoring assesses whether project inputs are being delivered, are being used as intended, and are having the initial effects as planned. It is an internal project activity, an essential part of good management practice and therefore an integral part of day-to-day management. Whereas, evaluation assesses the overall project effects, both intentional and unintentional and their impacts. It involves comparisons requiring information from outside the project either in time, area, or population. The relative role of monitoring and evaluation varies with the type of projects.

Based on the participatory approach, the Information System proposed is being designed and developed as a permanent instrument for the planning, monitoring, evaluation, and adjustment of project management, based on common information tools made available to all stakeholders concerned by the implementation of

the project. This approach aims at strengthening the overall results of the project, increasing the sustainability of activities, and improving resource utilization and management of risks and difficulties of the project implementation.

Design & development of ME&IE GIS based Information Management System is based on Agile Methodology as Software Development Process. Under which requirements and solutions evolve through the collaborative effort of self-organizing and cross-functional teams and end user / field experiences. The adaptation of Agile development methodology ensured the early completion of task and keeps evaluating it for better results as per the project requirement. It would be helpful to strategize the design and development phase, successful implementation, on-going maintenance, and up-gradation of the GIS based Information System.

Our experience shows that data generated in the field by client, field staff and project consultant is not timely communicated to PMUs. As a result, the dashboard/ Information System remain behind the actual progress on the ground. Therefore, prompt and real time data communication are essential to the Information System. For this purpose, one focal person in each province/ area is required.

#### 4.3.8 Regular Routine Monitoring

We understand that the regular routine monitoring activities started with the ME&IE Consultants on board. This phase of the assignment includes (i) the monitoring of input-output and process as defined in the Annual Work Plan and Budget (AWPB) and (ii) the tracking of the outcome indicators. Regular routine monitoring will look at the extent to which the proposed

project activities are being implemented as planned. We also understand that the consultant are responsible for the regular routine monitoring and should work in close collaboration with FPMU-FWMC, PC, and respective KP Departments.

Direktorat General Soil & Water Conservation & Directorate of Agricultural Engineering KP through their district/sub-offices & farmers/ SWCA, etc.

In order to track the indicators' values and measure the project performance, the ME&IE Consultancy have to analyze the relevant ME&IE data and report every quarter, applying the agreed methodology, reporting format and content.

Periodic reports on routine monitoring shall contain, at least: (i) a brief analysis of the results; calculating achievement rates and establishing trends, (ii) a summary with any relevant findings that may help or constraint the future data collection activities in the established periods and, if appropriate (iv) propose specific solutions assessing the advantages and disadvantages of each.

As stated in the TOR, additional special reports are to be produced "as and when required." We propose that some of these special reports ought to be thematic studies and case studies that can be punctually required at different times of the project implementation as to create knowledge on the implementation and its results, to be shared and further implemented.

## 5 MONTHLY MONITORING REPORT

The following section deals with the introduction and activities of monthly progress report:

### 5.1 INTRODUCTION

Monthly Monitoring Report (MMR) explains the understanding towards the all activities to be carried out as per TORs of ME&IE assignment and their completion within stipulated time frame.

### 5.2 OBJECTIVE OF MONTHLY MONITORING REPORT

The main objective of Monthly Monitoring Reports is to update the Client about the activities carrying out by the ME&IE Consultants during the reporting period. Reporting is an integral part of monitoring and evaluation framework.

#### The consultants carry out ME&IE assignments in two parts:

First monitoring will be through field visits and surveys of water storage reservoirs, mincro-watersheds, check dams, tube-wells and agriculture tube-wells. The processes, timelines and physical progress against targets set in the Annual Work Plans (AWPs) will be marked. The monitoring activities include baseline, midline and end-line surveys. The water saving assessment will be simultaneously carried out with the improvement activities of construction of water storage tanks and installation of tube-wells. The economic benefits to the agriculture sector will also be estimated in addition to the impact evaluation on the stakeholders and economy as a whole. For each monitoring activity one or more checklist(s) will be developed based on planned SOPs (Modus Operandi) and timelines. The activities will be monitored according to the checklists.

All the checklists will get approved from the client before executing in the field. Additional checklists will be devised if required. The outcome of the monitoring activities is expected in three states, i.e., the progress is on track, lagging behind or faster than planned. Reasons for lagging progress will be identified with possible solutions. In case of faster progress, good practices will be identified to

replicate in the project. All the physical progress will be monitored for quality as well.

The second part of the ME&IE assignment will be the development, operation, maintenance and handing-over the Management Information System (MIS) to the client at the end of the project.

Main features of the MIS are briefly presented as under:

Planning and input-output process monitoring, as well as the tracking of results indicators, assume a critical role in the management of development projects. We propose to develop, set up and implement a Web Based Monitoring Information System (MIS) useful for:

- Monitor the progress of project implementation and provide timely feedback to all project stakeholders,
- Monitor, assess, and summarize achievements (outputs and outcomes),
- Analyze factors affecting the project's implementation and achievements.

b) The basic functions of the MIS are to:

- Enable the FPMU-FWMC and PC to track the outcome indicators and assess progress in implementation against timescales and targets, and resources used against budgets, based on agreed annual work plans.
- Describe the factors and reasons triggering variations,
- Record and reflect new targets, whenever it is required,
- Draw important lessons to guide the decision-making,
- Enable forecasting for project accomplishment in comparison to the currently reported progress,
- Enable the project management to generate reports to funding partners, project beneficiaries and other stakeholders on the status and progress of the project implementation,
- Integrate GIS components to the MIS to complement field-level surveys and measurements.

c) Potential users' profiles could be the following:

- Federal Ministries
- NPC FPMU-FWMC
- NWMC (NESPAK)
- ME&IE Consultants
- Provincial concerned departments / maintaining system administrators.

d) The MIS will allow the project to enter the Annual Work Plan and Budget (AWPB) to enable process monitoring. This interface should facilitate the user to create activities for the current year and go back in previous years.

e) The following project information will be accessible at all times:

- Project description
- Project's objectives
- Implementation partners
- Locations of implementation
- Timelines
- Project activities (and % of accomplishments)
- Budgets (% of spending)
- The dashboard is a “real-time” user interface showing graphical and tabular information of multiple data sets. Dashboards allow users to appreciate a situation at a glance and aids in making informed decisions. The way in which data are presented directly affects how they are understood and interpreted/consequently the decisions that are made because of the data.

f) The kind of data that can be represented in the dashboard includes:

- Activity/indicator completion rates
- Budget expenditures
- Information disaggregated by localities (map views)
- Timelines, etc.

g) Notifications/Alerts

For each type of events (e.g., incoming deadlines, new data input, requests, etc.) the user will receive notifications/alerts of said events within the MIS and via e-mail either:

- As the event is created
- Daily / Weekly/ Monthly/Quarterly updates.

When an alert generated and in what form and frequency will be decided in consultation with users/clients.

h) Change Tracking

The system records actions of users such as creating data, removing data, data entry, data validation, etc. (e.g., latest update to an open quarterly report). The system records the name of the user, the date and time of change, actions made, code of items altered. This function is crucial to monitor the ME&IE processes.

i) Key Principles

- The system provides Excel-like functionality including filtering/sorting columns (reducing data-entry and increasing ease-of-use).
- The data entry and validation of plans and different reports are linked to user profiles
- The system displays an error message when not able to save the data.
- For all operations, the system keeps an audit trail with the user, date and time of the operation.

### 5.3 REPORTING PERIOD

This 2<sup>nd</sup> Monthly Monitoring Report (MMR) covers the progress period from 1<sup>st</sup> February 2021 to 28 February.

Activities completed during the reporting period are discussed briefly.

#### 5.3.1 Establishment of ME&IE (Consultants) Office at Peshawar:

The building for the office is hired in University Town, Peshawar at House No. 358, Khyber Colony No. 2, Tahkal Payan, University Road, Peshawar. The office will be equipped with office furniture and equipment during the next reporting month.

### 5.4 MOBILIZATION OF ME&IE CONSULTANT:

Dr. Usman Mustafa, Team Leader (ME&IE Consultant) has already joined the project on December 15, 2020 at M&E&IE Consultants Office Peshawar. Team leader remained engaged in reviewing available project data.

## 5.5 DRAFT INCEPTION REPORT

Basic data related to project activities was collected and incorporated in draft Inception Report. Draft Inception was prepared and submitted to NPC office for review and comments. Final Inception will be submitted after incorporating the comments when received from client.

## 5.6 PREPARATION OF MONITORING TOOLS (Field Survey Questionnaires)

Preparation of Monitoring Tools started in reporting period and draft version will be shared with client for comments and finalization. These are also included in the draft inception report.

## 5.7 PREPARATION OF ANDROID BASED APPLICATION FOR FIELD SURVEY

Development of Android Based application for field survey is in progress. About 30% work has been completed on this task.

Android is a mobile operating system based on a modified version of the Linux kernel and other open source software, designed primarily for touch screen mobile devices such as smart phones and tablets.

Data collection android application would have following features:

- i) Well optimized application for better work in online/offline environment User friendly interface
- ii) Consume less internet bandwidth for better connectivity at low internet/remote areas
- iii) Data is automatically uploaded when a connection is detected
- iv) Data immediately available right after it's collected
- v) signatures, photos and much more
- vi) Strong safeguards against data loss
- vii) Synchronize data via SSL, ensures data can't be read by a third party
- viii) Encrypted data will be saved at device and server

Preparation and testing of android based application for field survey is in progress.

## 5.8 DEVELOPMENT OF MIS/GIS SYSTEM

Geographic Information System (GIS) is computer based system. The ICT team of the project is working on it.

## 5.9 DEVELOPMENT OF WEBSITE FOR THE PROJECT

Development of Project Website is in progress. A prototype version of this assignment will be shared with client and will be launched soon after approval of Client. The ICT team of the project is working on it.

A website is a collection of web pages and related content that is identified by a common domain name and published on at least one web server. All publicly accessible websites collectively constitute the World Wide Web. Nowadays, the website is the primary communication tool as well as the front face of organization. In development projects, the prime purpose of the website is to communicate the project activities, outcome, impact reports and the publication of the notices like; tenders and bid evaluation reports for the transparent procurement processes. To develop the project website, Content Management System (CMS) will be used. By the implementation of CMS based website it will ensure the interactivity at website and easy update page content, images, documents, and integration with analytical systems to track pages and site performance.

Website structure is the main content planning phase. To finalize the structure of website a close consultation with key stakeholders is required. A preliminary structure of the website will have the following pages:

- i) Homepage (Landing page)
- ii) Project Introduction
- iii) Project Components
- iv) Project activities
- v) Progress Reports
- vi) Monitoring Reports
- vii) Impact Reports
- viii) Project Progress
- ix) Procurement
- x) Procurement of Goods, Services & works
- xi) Evaluations and Results
- xii) Career
- xiii) Media Gallery
- xiv) Contact
- xv) FAQs (Frequently Asked Questions)

## 5.10 WORK SCHEDULE AND PLANNING FOR DELIVERABLE

The project working schedule and planning matrix for deliverables was finalized and is attached to the report as **Annex-C**.

## ANNEXES

## ANNEX-A: Project Progress Reporting Framework (PPRF)

Project Title.....

Report Name and Period.....

Area Name .....

Sr. No.	STRATEGY /ACTIVITIES	Reporting Quarter								Year to Quarter(Cumulative)							
		Physical Progress				Financial Progress				Physical Progress				Financial Progress			
		Unit of Measure	Target/Planned	Actual/Achievement	Variance%	Committed Liability of Previous Year	Budget	Allotted(PC-1)	Actual Expenditure	Unit of Measure	Target/Planned	Actual/Achievement	Variance%	Committed Liability of Previous Year	Budget/Allotted(PC-1)	Actual Expenditure	Variance%
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
<b>Area details.....?</b>																	
1	Activity details .....																
<b>Sub Totals</b>																	
<b>Area details.....?</b>																	
2	Activity details .....																
<b>Sub Totals</b>																	
<b>Total(s)</b>																	
<b>Note:1-Report Summary will be Prepared Separately from the data consolidated Area wise and Components Wise.....?</b>																	
<b>2- More columns will be added as per requirements....?</b>																	

## ANNEX-B: MONITORING LOG-FRAME

### ANNEX-B: Monitoring Log-frame

Project Sub-component	Target	Activities	Outputs	Outcome		Goal/ impact	Methodology for Measuring Results
				Baseline indicator	Target after completion of Project		
<b>Component A. Soil &amp; Water Conservation Component</b>							
1.	- Construction of 5,000 water ponds (WSPs)	<p>a) 5,000 small farmers mobilized to construct water ponds</p> <p>b) They agree to contribute 20% of the cost</p> <p>c) Agree to first construct the tank with his/her own funds and then received subsidy at 80% on issuance of FCR*</p>	Approximately 12,500 acres of agriculture land will be irrigated from these interventions.	2,000 water ponds	Crop production per unit area will increase by conserving runoff water/water from perennial springs. Livestock will be increased; ultimately farmer's living standards will improve.	Approximately 12,500 acres of the land will be changed into crop fields and fruits orchids, which will increase farmer's income. More than 25,000 farmers will permanently engage in agriculture sector. These will provide short term employment to approximately 40,000 labors during the construction period of the interventions.	<p>a) Adopting the Sampling formula/ sample of water ponds farmer will be surveyed</p> <p>b) A data collection form will be designed to measure water saving due to WSPs</p> <p>c) The survey will determine:           <ul style="list-style-type: none"> <li>• Cropping pattern before and after the improvement;</li> <li>• Cropping intensities before and after improvement;</li> <li>• Before and after crop yields;</li> <li>• Before and after employment;</li> </ul>           The difference between before and after will be considered the result of the intervention after netting out the contribution of the growth pattern of the crop sector otherwise.         </p> <p>d)</p>

Project Sub-component	Target	Activities	Outputs	Outcome		Goal/ impact	Methodology for Measuring Results
				Baseline indicator	Target after completion of Project		
2.	Construction of 3,000 Check dams (CD)	<p>a) In each Check dam village, (small farmers mobilized will be to construct check dams</p> <p>b) They agree to contribute 20% of the cost</p> <p>c) Agree to first construct the tank with his/her own funds and then received subsidy at 80% on issuance of FCR*</p>	Approximately 7,500 acres of the land will be reclaimed.	2,500 check dams	Approximately 7500 acres of the land will conserve; ground water table of the nearby wells will rise.	Land value of the project area will increase; more than 7,500 acres of the land will bring under cultivation. Climatic condition of the area will improve and livestock will be benefited. More than 15,000 people will permanently engage in agriculture activities in the project area. More than 24,000 labors will be provided with short term employment during the construction period of the intervention.	<p>a) Adopting the Sampling formula/ sample of water ponds farmer will be surveyed</p> <p>b) A data collection form will be designed to measure water saving due to check dams</p> <p>c) The forms used for baseline and impact surveys in case of WSP will also be used for Check dams</p> <p>d) Same data analysis will be carried out here as in WSPs (1)</p>
3.	Construction of 330 Water Reservoir (WR)	<p>a) In each Water Reservoir village, (small farmers will be mobilized will be to construct it.</p> <p>b) They agree to contribute 20% of the cost</p> <p>c) Agree to first construct the tank with his/her own funds and then received subsidy at 80% on issuance of</p>	Approximately 9,900 acres of land will be irrigated from this intervention.	250 mini dams	Ground water table will be improved; farmer's income will be increased. Livestock will be benefited.	Culturable wasteland will be developed by supplying stored water. Ground water table will rise up. Fish farming, livestock and forestry will be improved. Over all livelihood of the farmer community will improve. Approximately 19,800 people will permanently engage in agriculture, livestock and fish rearing etc. More than 2,640 labors will	<p>a) Adopting the Sampling formula/ sample of water ponds farmer will be surveyed</p> <p>b) A data collection form will be designed to measure water saving due to WRs</p> <p>c) The forms used for baseline and impact surveys in case of WSP will also be used for WRs</p> <p>d) Same data analysis will be carried out here as in WSPs (1)</p>

Project Sub-component	Target	Activities	Outputs	Outcome		Goal/ impact	Methodology for Measuring Results
				Baseline indicator	Target after completion of Project		
		FCR				be benefited from the scheme.	
4.	Construction of 2,500 Stream bank stabilization (SBS)	a) In each SBS village, small farmers will be mobilized b) They agree to contribute 20% of the cost c) Agree to first construct the tank with his/her own funds and then received subsidy at 80% on issuance of FCR*	Protecting/reclaiming about 6,250 acres of agricultural land from erosion with floods water.	15,000 stream bank stabilization structures.	Per unit area of crop production will be saved.	Approximately 6,250 acres of agriculture land will be saved directly from floods water. This will further enhance the life of precious dams and reservoirs. This may engage approximately 12,500 farmers for long time in agriculture sector. 20,000 labors will work during construction period of these intervention	a) Adopting the Sampling formula/ sample of water ponds farmer will be surveyed b) A data collection form will be designed to measure water saving due to SBSs c) The forms used for baseline and impact surveys in case of WSPs will also be used for SBSs d) Same data analysis will be carried out here as in WSPs (1)
5.	Construction of 1,000 Gated field Inlet Outlet/Spillway (GFIO/S)	a) In each GFIO/Spillway village, small farmers will be mobilized b) They agree to contribute 20% of the cost c) Agree to first construct the tank with his/her own funds and then received subsidy at	Sufficient amount of water will be provided to about 2,500 acres of land for irrigation in rod kohi areas of the province.	1,500 field inlets and spillways.	Farmer's income will increase; fertile land degradation will be minimized.	Approximately 2,500 acres of agriculture land will be benefited directly from this intervention. Approximately 5,000 farmers will permanently engage in agriculture sector for long period of time. These interventions will provide short term employment to about 5,000 labors.	a) Adopting the Sampling formula/ sample of water ponds farmer will be surveyed b) A data collection form will be designed to measure water saving due to GFIO/S c) The forms used for baseline and impact surveys in case of WSP will also be used for GFIO/s d) Same data analysis will be carried out here as in WSPs (1)

Project Sub-component	Target	Activities	Outputs	Outcome		Goal/ impact	Methodology for Measuring Results
				Baseline indicator	Target after completion of Project		
		80% on issuance of FCR*					
6.	Development of 370 acres land for terracing (LFT)	a) In each LT village, small farmers will be mobilized b) They agree to contribute 20% of the cost c) Agree to first construct the tank with his/her own funds and then received subsidy at 80% on issuance of FCR*	Farmer's income will be increased by increasing agricultural land due to terraces development.	500 acres	Per unit production of farmers will increase by converting approximately 370 acres of non-culturable waste land into culturable.	Crop production will increase; land sliding will reduce due to terraces formation; rainwater infiltration will increase. Approximately 740 farmers will permanently engage in agriculture. Approximately 1,850 labors will be benefited from these interventions.	a) Adopting the Sampling formula/ sample of water ponds farmer will be surveyed b) A data collection form will be designed to measure water saving due to WSPs c) The forms used for baseline and impact surveys in case of WSP will also be used for LFTs d) Same data analysis will be carried out here as in WSPs (1).
7.	Development of 70 numbers of micro-watershed areas (MWA)	a) In each MWA small farmers mobilized to construct MWA b) They agree to contribute 20% of the cost c) Agree to first construct the tank with his/her own funds and then received subsidy at 80% on issuance of FCR*	Approx. 7,000 acres of the area will be converted into agriculture/ forest land which will improve the aesthetic value of the area.	02 micro watershed developed	Culturable wasteland will be converted into an agricultural productive land. Farmer's income will be increased through agriculture, livestock, fisheries and forestry etc.	Developing micro-watersheds will improve climatic condition of the area; floods chances will be minimize by harvesting rainwater in water harvesting interventions; land sliding and soil erosion will be minimized. Moreover, aesthetic value of the land will be improved. Approximately 14,000 people will engage in	a) Adopting the Sampling formula/ sample of water ponds farmer will be surveyed b) A data collection form will be designed to measure water saving due to MWA s c) The forms used for baseline and impact surveys in case of WSP will also be used for WRs d) Same data analysis will be carried out here as in WSPs (1).

Project Sub-component	Target	Activities	Outputs	Outcome		Goal/ impact	Methodology for Measuring Results
				Baseline indicator	Target after completion of Project		
						agriculture sector permanently. Approximately 14,000 labors will be directly benefited during the process of micro-watersheds development.	
8.	Constructing 370 numbers of water Seepage harvesting Galleries (WSHG)	<ul style="list-style-type: none"> <li>a) In each WSHG farmers will be mobilized to construct water ponds</li> <li>b) They agree to contribute 20% of the cost</li> <li>c) Agree to first construct the tank with his/her own funds and then received subsidy at 80% on issuance of FCR*</li> </ul>	Approx. 925 acres of land will be irrigated from this intervention.	15 water seepage galleries	More area will bring under cultivation by establishing crop fields and fruits gardens in the project area. Livestock will increase and more people will engage in agriculture sector.	Continuous supply of clean water for agriculture, livestock and human beings will be ensured. Water crises will be minimized in the project area. More than 1,850 number of people will engage in agriculture activities for long period of time. About 1,850 labors will be directly benefited during the construction process.	<ul style="list-style-type: none"> <li>a) Adopting the Sampling formula/ sample of water ponds farmer will be surveyed</li> <li>b) A data collection form will be designed to measure water saving due to WSHG s</li> <li>c) The forms used for baseline and impact surveys in case of WSP will also be used for WRs</li> <li>d) Same data analysis will be carried out here as in WSPs (1)</li> </ul>
9.	800 numbers of Agronomic low-cost interventions (ALCI)	<ul style="list-style-type: none"> <li>a) In each ALCI village small farmers mobilized to ALCI</li> <li>b) They agree to contribute 20% of the cost</li> <li>c) Agree to first</li> </ul>	Approx. 2000 acres of land will be protected from erosion by these interventions.	2000 various low cost small interventions	More area will bring under cultivation; economic condition of the local community will be	Land will be protected from erosion; infiltration will be improved during rainfall; livestock will be benefited. Approximately 2400 farmers will permanently engage in agriculture. These will also	<ul style="list-style-type: none"> <li>a) Adopting the Sampling formula/ sample of water ponds farmer will be surveyed</li> <li>b) A data collection form will be designed to measure water saving due to ALCI s</li> <li>c) The forms used for baseline and</li> </ul>

Project Sub-component	Target	Activities	Outputs	Outcome		Goal/ impact	Methodology for Measuring Results
				Baseline indicator	Target after completion of Project		
		construct the tank with his/her own funds and then received subsidy at 80% on issuance of FCR*			improved.	provide short term employment to about 2400 labors.	impact surveys in case of WSP will also be used for ALCIs d) Same data analysis will be carried out here as in WSPs (1)
10.	230 acres of Sand Dunes Stabilization (SDS)	a) In each SDS locality small farmers mobilized to construct water ponds b) They agree to contribute 20% of the cost c) Agree to first construct the tank with his/her own funds and then received subsidy at 80% on issuance of FCR*	Approx. 230 acres land of sand dunes will be stabilized by growing kana plants.	200 acres Sand dunes effects stabilized.	Non-culturable sand dunes will be converted into an economically productive piece of land.	Sand dunes stabilization through plantation will be a direct source of income generation for the local community by making homemade items from the stems of the kana plants. These will also help in improving climatic condition of the project area. Meanwhile about 460 numbers of labor will be benefited.	a) Adopting the Sampling formula/ sample of water ponds farmer will be surveyed b) A data collection form will be designed to measure water saving due to SDS s c) The forms used for baseline and impact surveys in case of WSP will also be used for SDSs d) Same data analysis will be carried out here as in WSPs (1)
11.	500 Nos Capacity Building (CB)	500 small farmers capacity will be built on different traits.	An estimated 500 trainings will be conducted for stakeholders including farmers and departmental	2000 Capacity building trainings conducted.	Enhanced capacity for better management of soil and water resources.	Soil and water resources of the province will better be managed with better management practices. The capacity of the stake holder will be enhanced in better management of soil and water resources of the	a) Pre training and post training evaluation will be conducted from all farmers to estimate the enhancement in their knowledge and skill. b) In this connection same Performance will be used before the conduct of the training after the completion of

Project Sub-component	Target	Activities	Outputs	Outcome		Goal/ impact	Methodology for Measuring Results
				Baseline indicator	Target after completion of Project		
			staff.			country in general and Khyber Pakhtunkhwa in particular.	the training.
<b>Component B Agricultural Engineering Component</b>							
12	Procurement and installation of 700 Solar, pumping System and 300 Tube Wells (SPS&TW).	<p>a) Solar Pumping small farmers mobilized to install SPS&amp;TW</p> <p>b) They agree to contribute 20% of the cost</p> <p>c) Agree to first construct SPS&amp;TW with his/her own funds and then received subsidy at 80% on issuance of FCR*</p>	Irrigation of 17,500 hectares (43,225 acres) of land.	> 650 SPS&TW installed.	Conversion of rain fed land into irrigated land will add more value to the land and the enhance production from crops/Orchard will help in improving the socio-economic condition of the farming community.	Provision of irrigation water will lead to increase Agriculture production and self-sufficiency in food grain.	<p>a) Adopting the Sampling formula/ sample of SPS&amp;TW farmers will be surveyed</p> <p>b) A data collection form will be designed to measure water saving due to SPS&amp;TWs</p> <p>c) The forms used for baseline and impact surveys in case of WSP will also be used for SPS&amp;TWs. Same data analysis will be carried out here as in WSPs (1)</p>
13	700 on-site training of farmers in adaptation of new techniques for pumping sub-surface water.	<p>a) 5,000 small farmers mobilized to construct water ponds</p> <p>b) They agree to contribute 20% of the cost</p> <p>c) Agree to first</p>	Irrigation water Pumping cost will be reduced by adopting solar technology.	> 2,000 trainings conducted.	The cropping intensity will be enhanced.	Farmers of the project area will be educated in the modern techniques being adopted in Agriculture and therefore, pay more attention to increase crop yield and Farm income.	<p>d) Adopting the Sampling formula/ sample of trained farmer farmer will be surveyed</p> <p>e) A data collection form will be designed to measure water saving due to trainings</p> <p>f) The forms used for baseline and impact surveys in case of WSP will also be used for trainees</p>

Project Sub-component	Target	Activities	Outputs	Outcome		Goal/ impact	Methodology for Measuring Results
				Baseline indicator	Target after completion of Project		
		construct the tank with his/her own funds and then received subsidy at 80% on issuance of FCR*					Same data analysis will be carried out here as in WSPs (1

## ANNEX-C: Work Schedule and Planning for Deliverables