



# Capacity Needs Assessment and the Capacity Building and Stakeholder Engagement Plan

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Project Raindrop

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## Executive Summary

This report presents the findings from a comprehensive **capacity needs assessment** and proposes a **Capacity Building and Stakeholder Engagement Plan** for the sustainable implementation of rainwater harvesting systems in the selected areas. The project aims to address **water security** challenges exacerbated by climate change and to empower local stakeholders to manage water resources effectively. The capacity-building plan is designed to ensure that these systems are technically sound, financially sustainable, socially inclusive, and resilient to future climate impacts.

### Key Findings from the Capacity Needs Assessment

The capacity needs assessment, which involved consultations with local communities, government bodies, NGOs, private sector partners, and academic institutions, revealed several critical gaps:

- **Technical Knowledge Gaps:** Many local stakeholders, particularly in rural areas, lack the technical skills needed to install, operate, and maintain rainwater harvesting systems. This is especially true for more advanced systems like solar-powered pumps and sensor-based irrigation systems.
- **Institutional and Governance Weaknesses:** There are significant gaps in the ability of local governments and water user committees to coordinate and manage water resources effectively. Governance structures need to be strengthened to ensure transparency and accountability in decision-making.
- **Financial Sustainability Challenges:** Many stakeholders struggle to access funding for the ongoing maintenance and upgrades of the systems. There is a need for sustainable financial models, including cost-sharing mechanisms, to ensure the systems remain operational in the long term.
- **Social Inclusivity and Gender Equity:** Women and marginalized groups are underrepresented in decision-making processes related to water management. Ensuring their active participation is crucial for achieving social equity and improving water governance.
- **Climate Change Awareness:** While stakeholders are generally aware of climate change, there is limited understanding of how to integrate **climate adaptation strategies** into water resource management.

### Proposed Capacity Building Activities

The report outlines a series of capacity-building activities designed to address these gaps:

1. **Technical Training:** Hands-on workshops for local technicians and community members will equip them with the skills needed to manage rainwater harvesting systems. Training will cover both basic operations and advanced technologies, ensuring that local stakeholders can maintain the systems independently.
2. **Institutional Strengthening:** Governance training will be provided to local government bodies and water user committees, focusing on stakeholder coordination, policy alignment, and governance frameworks that promote transparency and community involvement.
3. **Financial Management:** Stakeholders will receive training on financial management and budgeting, with a focus on developing sustainable cost-sharing models. These models will ensure that maintenance costs are shared between communities, local governments, and the private sector.
4. **Social Inclusivity and Gender Equity:** Gender-responsive training programs will empower women to take on leadership roles in water management, while inclusive governance workshops will ensure that marginalized groups are actively involved in decision-making processes.
5. **Climate Resilience Training:** Capacity-building efforts will include training on climate-resilient water management practices, helping stakeholders adapt to changing rainfall patterns, droughts, and other climate-related challenges.

### Monitoring and Evaluation (M&E) Framework

To ensure the success of the capacity-building efforts, a **Monitoring and Evaluation (M&E) framework** has been developed. This framework includes pre- and post-training assessments, participant feedback surveys, and periodic reviews of progress. The M&E process will provide ongoing feedback and allow for adjustments to the capacity-building activities as needed, ensuring that they remain relevant and effective.

### **Recommendations**

Based on the findings and analysis, the report provides several key recommendations to ensure the successful implementation of the rainwater harvesting systems:

- **Prioritize Technical Training:** Provide practical, hands-on training for local stakeholders to ensure they can operate and maintain the systems effectively.
- **Strengthen Governance Structures:** Establish or strengthen local water user committees and improve coordination between community leaders, local governments, and other stakeholders.
- **Develop Sustainable Financing Models:** Train stakeholders in financial management and develop cost-sharing mechanisms to ensure long-term financial sustainability.
- **Promote Social Inclusivity:** Ensure that women and marginalized groups are actively engaged in water management decisions through inclusive governance frameworks.
- **Increase Climate Awareness:** Incorporate climate resilience training into the capacity-building efforts, equipping stakeholders to manage water resources in a changing climate.

The **Capacity Building and Stakeholder Engagement Plan** outlined in this report is a crucial component of ensuring the long-term success and sustainability of the rainwater harvesting systems. By addressing the technical, institutional, financial, and social gaps identified in the capacity needs assessment, the plan will empower stakeholders at all levels to take ownership of the systems and ensure they continue to meet the needs of the communities they serve. The recommendations provided, along with a robust M&E framework, will guide the implementation of the capacity-building activities, ensuring that the project is responsive to local needs and adaptive to future challenges. Through collaboration, inclusivity, and a focus on climate resilience, this initiative has the potential to make a significant, lasting impact on water security and community well-being.

## 1. Introduction and Objective

The purpose of this report is to present the findings from the **capacity needs assessment** conducted in the selected areas for the deployment of rainwater harvesting systems, as well as to propose a **capacity building and stakeholder engagement plan**. This report is part of a broader initiative aimed at addressing the challenges of water management and climate resilience in the context of **locally led technology transfer**. It focuses on identifying the gaps in capacity among key stakeholders and outlining strategies to enhance their involvement in sustainable water resource management.

### 1.1 Context and Background

Pakistan faces significant challenges related to **water scarcity, climate change**, and the **sustainable management of water resources**. Increasing variability in rainfall patterns, more frequent droughts, and rising temperatures exacerbate these issues, particularly in rural and semi-urban areas. In response, the deployment of **rainwater harvesting systems** is a critical intervention aimed at improving water security, reducing dependence on over-extracted groundwater, and increasing community resilience to climate impacts.

However, the success of these systems hinges on the active participation and capacity of local stakeholders. Local communities, government officials, NGOs, and other relevant organizations must have the **technical knowledge, institutional capacity, and governance frameworks** to effectively implement, maintain, and monitor these systems over the long term. This report outlines the steps taken to assess the current capacity needs of these stakeholders and proposes a **capacity building and engagement plan** that addresses these gaps.

### 1.2 Objectives of the Report

The report has two main objectives:

#### 1. Assessing Capacity Needs:

- Identify the key capacity gaps among stakeholders in terms of **technical skills, governance, and institutional support** necessary for the successful implementation of rainwater harvesting systems.
- Evaluate the ability of local communities, government bodies, and other key actors to participate in the **long-term management** of water resources in response to climate challenges.

#### 2. Proposing a Capacity Building and Stakeholder Engagement Plan:

- Based on the findings of the capacity needs assessment, outline a detailed plan for **capacity building** that focuses on technical training, knowledge transfer, and institutional strengthening.
- Develop an engagement strategy to ensure that stakeholders, especially **women and marginalized groups**, are actively involved in the management of water resources and the adoption of climate-resilient practices.

### 1.3 Methodology

The capacity needs assessment was conducted using a **multi-pronged approach** to ensure a comprehensive understanding of the challenges and opportunities faced by stakeholders. The key methods employed were:

- **Stakeholder Consultations:** Direct engagement with stakeholders through interviews, focus groups, and consultations to gather insights on their needs and capacities.
- **Surveys:** A structured survey was conducted among local communities and government bodies to assess their knowledge, skills, and resources in relation to rainwater harvesting systems.

- **Secondary Data Review:** An analysis of existing literature and reports on water management, climate resilience, and capacity building was undertaken to inform the assessment.

This multi-method approach allowed for a robust and nuanced understanding of the various factors influencing stakeholder capacity and engagement.

## 1.4 Structure of the Report

The report is structured in two main parts:

1. **Capacity Needs Assessment:** This section presents the findings from the consultations and surveys, highlighting the technical, institutional, and social capacity gaps among stakeholders.
2. **Capacity Building and Stakeholder Engagement Plan:** Based on the identified needs, this section outlines a proposed plan for building stakeholder capacity, with a focus on training, engagement, and social inclusion.

## 2. Capacity Needs Assessment

### 2.1 Overview of Stakeholders

The implementation of rainwater harvesting systems in the selected area involves a diverse group of stakeholders, each playing a distinct role in the management and sustainability of water resources. Understanding these stakeholders' capacities, roles, and needs is crucial for ensuring that the technology transfer action plan is both effective and inclusive. This section provides an overview of the key stakeholders involved in the project, categorized by their roles and areas of influence.

#### 1. Local Communities

- **Role:** Local communities are at the heart of this initiative. They are both the primary beneficiaries of the rainwater harvesting systems and key participants in their management and maintenance. Their involvement is critical for the sustainability of the systems, as they will be responsible for day-to-day operations and long-term upkeep.
- **Characteristics:**
  - **Rural and semi-urban populations:** Many of the targeted areas are rural or semi-urban, where water scarcity is a growing issue due to climate variability.
  - **Women and marginalized groups:** Women, in particular, play a pivotal role in water collection and management at the household level. Ensuring their active participation in decision-making processes is vital for long-term success.
- **Capacity Needs:**
  - **Technical skills** for operating and maintaining rainwater harvesting systems.
  - **Knowledge on water conservation practices** and understanding the links between climate change and water management.

#### 2. Local Government Bodies

- **Role:** Local government bodies are responsible for overseeing the implementation of the rainwater harvesting systems and ensuring they align with regional and national water policies. They also play a key role in facilitating community engagement and providing institutional support.
- **Characteristics:**
  - **Provincial and municipal authorities:** These bodies manage local infrastructure and water resource allocation.
  - **Regulatory oversight:** They are tasked with ensuring that the systems adhere to regulatory standards, including environmental and water management policies.
- **Capacity Needs:**

- **Policy alignment:** Local governments need support to align the project with broader water management policies.
- **Institutional capacity:** Strengthening their ability to coordinate between various stakeholders and oversee long-term system maintenance.

### 3. National Government Agencies

- **Role:** National government agencies, such as the **Pakistan Council of Research in Water Resources (PCRWR)** and the **Ministry of Climate Change**, are responsible for setting the policy framework for water resource management and climate adaptation. These agencies provide technical expertise and governance support.
- **Characteristics:**
  - **Policy makers:** They shape the overarching policy environment, which determines how local and regional projects are implemented.
  - **Technical expertise providers:** Agencies like the PCRWR have significant experience in water research and technology deployment, which is crucial for ensuring the systems are technically sound and sustainable.
- **Capacity Needs:**
  - **Policy implementation:** National agencies need tools and resources to ensure that national policies are effectively implemented at the local level.
  - **Monitoring and evaluation:** Strengthening their ability to monitor the impacts of rainwater harvesting systems on a national scale.

### 4. Non-Governmental Organizations (NGOs)

- **Role:** NGOs, such as the **Hisaar Foundation** and the **Rural Support Programmes Network (RSPN)**, are key partners in the capacity building of local communities and facilitating stakeholder engagement. They have a strong presence at the grassroots level and are instrumental in promoting inclusive approaches, particularly in gender equity and social inclusion.
- **Characteristics:**
  - **Community engagement:** NGOs are often the bridge between communities and other stakeholders, ensuring that local voices are heard and that solutions are adapted to meet local needs.
  - **Advocates for inclusivity:** Many NGOs focus on ensuring that marginalized groups, including women and rural populations, are actively involved in the decision-making process.
- **Capacity Needs:**
  - **Technical expertise:** NGOs require additional training in the technical aspects of rainwater harvesting to better support communities.
  - **Gender and social inclusion strategies:** Further resources to enhance their work in ensuring the participation of vulnerable and marginalized groups.

### 5. Private Sector Partners

- **Role:** Private sector partners, particularly those involved in technology development and supply, are essential for ensuring the availability of the necessary equipment (e.g., solar pumps, rainwater storage tanks) and for providing technical support during and after system deployment.
- **Characteristics:**
  - **Technology providers:** Companies providing the technology for rainwater harvesting and related infrastructure (such as pumps, sensors, and monitoring tools).
  - **Service providers:** Businesses that offer maintenance services for the installed systems.
- **Capacity Needs:**
  - **Training in system customization:** Private sector partners may need to adapt technologies to suit the local environmental conditions.

- **Long-term service agreements:** Strengthening partnerships with local governments and communities to provide ongoing maintenance and support.

## 6. Academic and Research Institutions

- **Role:** Institutions like **PMAS Arid Agriculture University** and **WWF Pakistan** provide research and technical expertise, ensuring that the rainwater harvesting systems are based on sound science and tailored to the local environmental conditions.
- **Characteristics:**
  - **Research and development:** These institutions are key players in developing innovative water management solutions and evaluating their effectiveness in specific regions.
  - **Technical trainers:** They offer training programs and capacity-building workshops to local stakeholders.
- **Capacity Needs:**
  - **Research funding:** Increased resources to carry out more extensive studies on climate adaptation and water resource management.
  - **Collaboration with local stakeholders:** Strengthening ties with local communities and governments to ensure research is applied effectively.

This diverse set of stakeholders—ranging from local communities to national government agencies—plays a pivotal role in ensuring the successful deployment and sustainability of rainwater harvesting systems in the selected areas. Each stakeholder group brings its own strengths and faces unique capacity needs, all of which must be addressed to foster an inclusive and sustainable water resource management framework. The capacity building and stakeholder engagement plan will be designed to address these specific needs, ensuring that all stakeholders are equipped to contribute effectively to the long-term success of the project.

## 2.2 Assessment Methodology

The **capacity needs assessment** for this project was conducted using a multi-method approach to ensure that the process captured the diverse needs and capacities of all stakeholders involved. This methodology was designed to gather both qualitative and quantitative data, providing a well-rounded understanding of the gaps and opportunities for capacity building in the context of rainwater harvesting systems. The methods used included **stakeholder consultations, surveys, and a review of secondary data**. These approaches allowed for a comprehensive assessment, ensuring that the findings are relevant to the local context and address the specific challenges faced by different stakeholder groups.

### 1. Stakeholder Consultations

The primary method used to assess capacity needs was **direct consultation** with key stakeholders. This involved in-depth interviews and focus group discussions with representatives from local communities, government bodies, NGOs, private sector partners, and academic institutions. These consultations were critical in gathering insights on the practical challenges and capacity gaps faced by stakeholders at various levels of involvement.

- **Interviews:** One-on-one interviews were conducted with stakeholders who hold key decision-making positions, such as local government officials, community leaders, and private sector representatives. These interviews focused on understanding their technical knowledge, governance challenges, and institutional capacities related to water resource management.
- **Focus Groups:** Several focus groups were organized with local community members, including women and marginalized groups, to capture their perspectives on water resource challenges and the type of training and engagement they would need to manage rainwater harvesting systems effectively. This approach ensured that the voices of traditionally underrepresented groups were included.

### Key Discussion Topics

- Current knowledge of rainwater harvesting and water conservation techniques.
- Challenges in maintaining and operating water management systems.
- Perceptions of climate change impacts on local water resources.
- Institutional support available for technical and operational training.

### 2. Surveys

To complement the qualitative data from consultations, a **structured survey** was conducted among a larger sample of stakeholders. The survey was designed to quantitatively assess the existing capacity levels and identify specific areas where stakeholders need additional support. The questions were tailored to the role each stakeholder plays in water management, ensuring the data collected was relevant and actionable.

- **Survey Design:** The survey included a mix of multiple-choice questions, Likert scale ratings, and open-ended responses. These questions covered technical skills, governance capabilities, and the degree of awareness of climate change impacts on water resources.
- **Survey Administration:** The survey was distributed both in person (where feasible) and online, ensuring that stakeholders from remote areas had the opportunity to participate. Special effort was made to ensure that women and marginalized groups were adequately represented in the survey sample.

### Areas of Focus:

- Technical knowledge on rainwater harvesting system installation and maintenance.
- Understanding of groundwater recharge and climate-resilient water management.
- Access to financial and institutional resources for water management.
- Community engagement and governance structures in place for water resource management.

### 3. Secondary Data Review

A **review of existing literature** and secondary data was conducted to provide additional context and validate the findings from the consultations and surveys. This involved analyzing reports, research papers, and policy documents related to water management, climate change, and capacity building in Pakistan. The secondary data helped to establish baseline information on current capacities and existing efforts in the region.

### Key Documents Reviewed:

- **National Water Policy of Pakistan**
- **Pakistan's Climate Change Strategy and Action Plan**
- **Reports from local NGOs and international organizations** working on water management and climate adaptation.

**Purpose of the Review:** The secondary data provided a broader understanding of the institutional and policy landscape, ensuring that the capacity-building plan aligns with national and regional priorities. It also helped identify existing programs and initiatives that the project could build upon, avoiding duplication of efforts.

### 4. Data Analysis and Synthesis

Once data was collected through consultations, surveys, and the review of secondary sources, it was systematically analyzed to identify key trends, gaps, and capacity-building opportunities. This involved both **qualitative analysis** of the consultation notes and **quantitative analysis** of the survey responses.

- **Qualitative Analysis:** Thematic analysis was used to categorize feedback from stakeholder consultations into key themes, such as technical knowledge gaps, governance challenges, and community engagement barriers.
- **Quantitative Analysis:** Survey responses were statistically analyzed to quantify the capacity levels of different stakeholder groups and identify priority areas for capacity-building interventions.

The combined insights from these methods formed the foundation for the **capacity building and stakeholder engagement plan**, ensuring that it addresses the real needs of the communities and organizations involved in the project.

This multi-method approach ensured a robust assessment of capacity needs, allowing the project team to develop a **tailored and context-specific** capacity-building plan that empowers stakeholders to actively participate in the long-term management of rainwater harvesting systems.

### 2.3 Key Findings from the Capacity Needs Assessment

The **capacity needs assessment** revealed a range of challenges and opportunities across various stakeholder groups involved in the implementation of rainwater harvesting systems. The findings highlighted significant gaps in **technical knowledge**, **institutional capacity**, and **social inclusivity**, all of which need to be addressed to ensure the long-term success of the project. This section outlines the key findings from the assessment, organized by capacity area.

#### 1. Technical Capacity Gaps

One of the most prominent findings was the **lack of technical knowledge** among local stakeholders, particularly in the installation, operation, and maintenance of rainwater harvesting systems. While some stakeholders had basic awareness of water conservation techniques, many lacked the detailed skills required to manage the systems effectively.

- **Limited Technical Expertise:**
  - **Local communities:** Many community members, especially in rural areas, have limited technical knowledge about the installation and maintenance of rainwater harvesting systems. This gap is more pronounced in areas where local water management systems are either informal or under-resourced.
  - **Local technicians:** Although some technicians have experience with basic water management infrastructure, they lack specialized training in **solar-powered pumps**, **sensor-based irrigation systems**, and **atmospheric water generation (AWG)** technologies.
- **Training Needs:**
  - **Practical, hands-on training** is required for local technicians and community members to operate, monitor, and troubleshoot these systems.
  - There is a need for regular **refresher courses** to ensure that stakeholders can adapt to evolving technologies and techniques.

#### 2. Institutional and Governance Gaps

The assessment also revealed several **institutional weaknesses** that could hinder the effective management and sustainability of rainwater harvesting systems. These gaps include a lack of coordination between stakeholders, unclear governance structures, and insufficient institutional support for long-term system maintenance.

- **Coordination Challenges:**
  - **Local government bodies** often lack the capacity to effectively coordinate between various stakeholders, including community leaders, NGOs, and private sector partners. This lack of coordination can result in delays in project implementation and inefficiencies in resource allocation.
- **Governance Weaknesses:**

- **Water user committees** in some areas are either non-existent or ineffective, leading to poor governance of local water resources. In many cases, these committees lack formal decision-making authority and struggle to enforce water conservation practices.
- **Capacity Needs:**
  - Strengthening **institutional capacity** is critical, particularly at the local government level, to facilitate better coordination and governance.
  - Local governments and community leaders require **training in governance frameworks** that promote transparency, accountability, and community involvement in water resource management.

### 3. Financial Resource Constraints

The assessment identified significant challenges related to **financial sustainability**. Many stakeholders, particularly those in rural communities, expressed concerns about their ability to secure the financial resources necessary for the long-term maintenance of the rainwater harvesting systems.

- **Limited Access to Funding:**
  - Local governments and community groups often lack the funds needed to cover the ongoing maintenance and repair costs of the systems. This issue is exacerbated by limited access to **microfinance** or **government subsidies**.
- **Cost-Sharing Mechanisms:**
  - While some communities are willing to contribute to system maintenance, there is no established cost-sharing mechanism in place to pool resources effectively.
- **Capacity Needs:**
  - Developing **sustainable financing models**, such as cost-sharing agreements or partnerships with local businesses, is essential for ensuring the long-term viability of the systems.
  - Stakeholders require **training in financial management** and budgeting to plan for ongoing maintenance costs.

### 4. Social and Gender Inclusion

The assessment revealed a clear need for greater **social inclusion**, particularly in terms of engaging **women** and **marginalized groups** in the decision-making and management of water resources. Women, who are often the primary water users in households, are underrepresented in water management structures.

- **Gender Inequality in Decision-Making:**
  - In many communities, women are not actively involved in **water user committees** or local governance structures, despite their significant role in water collection and usage. This exclusion limits the effectiveness of water management efforts.
- **Marginalized Communities:**
  - Certain groups, such as ethnic minorities and economically disadvantaged communities, are often excluded from discussions on water resource management. These groups typically face greater challenges in accessing water, making their inclusion crucial for equitable water management.
- **Capacity Needs:**
  - **Gender-responsive capacity building** is essential to ensure that women and marginalized groups are empowered to participate in the governance and management of water resources.
  - Efforts should be made to establish **inclusive governance structures**, ensuring that all community members have a voice in decision-making processes.

### 5. Climate Change Awareness and Resilience

Finally, the assessment revealed that while most stakeholders are aware of the general impacts of climate change, there is a **lack of understanding** regarding the specific effects of climate change on local water resources and how to adapt effectively.

- **Limited Knowledge of Climate Resilience:**
  - Many stakeholders, especially at the community level, lack detailed knowledge about **climate-resilient water management** practices. This knowledge gap includes how to prepare for increasing droughts, floods, and changing rainfall patterns.
- **Capacity Needs:**
  - Stakeholders require **awareness-raising programs** on the links between climate change, water resource management, and community resilience.
  - **Capacity-building efforts** should include training on **climate adaptation strategies** and how to integrate these into local water management systems.

The capacity needs assessment has identified critical gaps in technical knowledge, governance, financial sustainability, social inclusion, and climate resilience. Addressing these gaps will be essential to ensure the long-term success of the rainwater harvesting systems. The findings from this assessment will directly inform the **Capacity Building and Stakeholder Engagement Plan**, which will focus on providing targeted training, improving governance structures, and fostering inclusive, climate-resilient water management practices.

## 2.4 Analysis of Capacity Needs

The capacity needs assessment reveals several critical gaps across various dimensions of stakeholder involvement in the rainwater harvesting systems project. This section analyzes these needs by identifying **priority areas** for capacity building and breaking them down by **stakeholder groups**. The analysis aims to provide a clear roadmap for the capacity-building interventions that will be proposed in the next section, ensuring that these interventions are well-targeted and effective.

### 1. Prioritization of Capacity Gaps

Based on the assessment findings, the most pressing capacity needs fall into the following categories:

- **Technical Knowledge and Skills:** There is a widespread lack of technical expertise, especially in the installation, maintenance, and operation of the advanced technologies associated with rainwater harvesting systems. This knowledge gap is particularly acute at the community level, where local technicians and water managers have little to no formal training in managing these systems.
- **Institutional and Governance Capacity:** Effective water resource management requires strong coordination and governance structures. However, the assessment indicates significant weaknesses in the ability of local governments, community groups, and water user committees to work together effectively. Strengthening these institutional frameworks is essential for the long-term sustainability of the systems.
- **Financial Resource Management:** The financial sustainability of the rainwater harvesting systems is a major concern. Stakeholders, particularly in rural areas, are often unaware of available funding mechanisms or lack the skills to develop cost-sharing models that could support the ongoing maintenance of the systems. This financial knowledge gap needs to be addressed to ensure the longevity of the initiative.
- **Social Inclusivity and Gender Equity:** Ensuring that women and marginalized groups have a meaningful role in the management and governance of water resources is critical to the project's success. The assessment reveals that these groups are currently underrepresented in decision-making processes, which limits the effectiveness of water management at the community level. Addressing these social gaps will enhance inclusivity and improve overall outcomes.
- **Climate Change Adaptation Awareness:** While most stakeholders are aware of climate change, many do not fully understand the specific challenges it poses for local water resources. There is a need for training on climate adaptation strategies, especially regarding how to manage water systems in the face of increasingly erratic rainfall and prolonged droughts.

## 2. Stakeholder-Specific Capacity Needs

Different stakeholders require distinct forms of capacity building to effectively engage in the project. This analysis breaks down the **capacity needs** for each group, highlighting the specific areas where targeted interventions are required.

### Local Communities

- **Technical Capacity:** The primary need is for practical, hands-on training on how to operate and maintain the rainwater harvesting systems. Local technicians, in particular, require specialized training in installing and troubleshooting technologies such as solar-powered pumps and sensor-based irrigation systems.
- **Governance and Social Inclusion:** Community members, especially women, need training in governance processes so that they can actively participate in water user committees and decision-making bodies. Social inclusion programs are necessary to ensure that marginalized groups are adequately represented.

### Local Government Bodies

- **Institutional Coordination:** Local governments need capacity building in governance frameworks that promote effective coordination between various stakeholders, including communities, NGOs, and private sector partners. This includes training on how to integrate rainwater harvesting systems into broader water management strategies.
- **Policy Alignment and Funding:** Local officials require training on how to align the project with national water policies and secure funding from both governmental and non-governmental sources. Developing cost-sharing models and accessing subsidies are key areas where capacity is needed.

### National Government Agencies

- **Policy Implementation:** National agencies like the Pakistan Council of Research in Water Resources (PCRWR) need support in translating national water policies into actionable plans at the local level. This requires building institutional mechanisms that ensure consistent monitoring, evaluation, and feedback loops.
- **Technical Oversight:** Agencies should enhance their capacity to provide technical oversight and support to local governments and communities. This includes establishing long-term partnerships with academic institutions and private sector technology providers to maintain system functionality over time.

### NGOs and Civil Society Organizations

- **Community Engagement:** NGOs are crucial for fostering community ownership of the rainwater harvesting systems. However, many NGOs lack the technical knowledge to support system installation and maintenance effectively. Building their technical capacity will enhance their ability to assist communities in managing these systems sustainably.
- **Gender and Social Inclusion:** While NGOs are often leaders in promoting social inclusion, they need additional resources to implement gender-responsive programs effectively. Capacity-building efforts should focus on helping these organizations design and implement programs that engage women and marginalized communities in meaningful ways.

### Private Sector Partners

- **Technical Customization:** The private sector, particularly technology providers, need support in customizing their products to suit the specific environmental and social conditions in the selected areas. This may include working with local stakeholders to adapt technologies to local climates or offering tailored maintenance services.

- **Long-Term Partnerships:** There is a need for developing long-term service agreements between private sector technology providers and local governments or communities. These agreements would ensure that systems are maintained over time, with clear lines of accountability for repairs and upgrades.

### 3. Capacity Building Priorities

Based on the stakeholder-specific needs, the following priority areas for capacity building have been identified:

- **Technical Training for Local Technicians and Communities:** This is the most immediate and critical need. Without proper training, local stakeholders will be unable to operate or maintain the systems effectively, undermining the entire project's sustainability.
- **Institutional Strengthening for Local Governments:** Building the governance capacity of local governments will ensure that they can coordinate effectively between different stakeholders and manage the systems as part of a broader water resource management strategy.
- **Financial Management and Cost-Sharing Models:** Local governments and communities need the tools and training to develop sustainable financial models. This could include setting up water user fees, accessing government subsidies, or establishing partnerships with local businesses to share costs.
- **Social Inclusivity and Gender Equity Training:** Ensuring that women and marginalized groups are included in water resource governance structures is a priority. Capacity-building efforts should focus on creating inclusive governance frameworks and promoting gender equality in decision-making processes.
- **Climate Resilience Training:** Stakeholders need to be equipped with the knowledge and skills to manage water systems in the context of climate change. This includes understanding how to adapt to changing rainfall patterns, manage droughts, and ensure water availability during extreme weather events.

The analysis of capacity needs highlights critical gaps that must be addressed to ensure the success and sustainability of the rainwater harvesting systems. By prioritizing technical training, institutional strengthening, financial sustainability, and social inclusivity, the project will be well-positioned to empower stakeholders at all levels and foster long-term resilience to water scarcity and climate change. The findings from this analysis will guide the development of a targeted capacity building and stakeholder engagement plan that addresses these needs comprehensively.

## 3. Capacity Building and Stakeholder Engagement Plan

### 3.1 Objectives of the Capacity Building Plan

The **Capacity Building Plan** aims to strengthen the ability of local stakeholders—ranging from communities to government bodies and NGOs—to manage and sustain the rainwater harvesting systems effectively. By addressing the identified capacity gaps, the plan will empower stakeholders to take ownership of the systems, ensuring their long-term viability and contributing to the resilience of the selected area in the face of climate change. The following objectives guide the structure and implementation of the plan:

#### 1. Strengthen Technical Capacity

The primary objective is to ensure that local stakeholders, particularly **technicians and community members**, have the necessary technical skills to install, operate, and maintain the rainwater harvesting systems. This includes providing practical, hands-on training on the full range of technologies, from basic water storage solutions to more advanced systems such as **solar-powered pumps** and **sensor-based irrigation**.

- **Key Focus Areas:**

- Train local technicians in **system installation, troubleshooting, and maintenance**.
- Equip community members with the knowledge needed to manage water distribution effectively.
- Develop **refresher courses** to keep stakeholders updated on the latest advancements in water management technologies.

## **2. Build Institutional Capacity and Governance**

For the systems to be sustainable, local and national institutions need to be capable of **governing water resources** effectively. This objective focuses on strengthening the **institutional frameworks** that allow for transparent governance, clear decision-making processes, and better coordination between stakeholders.

- **Key Focus Areas:**

- Strengthen the capacity of **local governments** to coordinate between stakeholders, including NGOs, private sector partners, and communities.
- Support the establishment and effective functioning of **water user committees**.
- Provide training on **policy alignment**, ensuring that local and national water management policies support the project's goals.

## **3. Ensure Financial Sustainability**

Another key objective is to build the financial management skills of stakeholders so they can develop sustainable financing mechanisms. This includes identifying cost-sharing models, accessing subsidies, and establishing partnerships with local businesses and governments to ensure the systems remain functional in the long term.

- **Key Focus Areas:**

- Train local stakeholders on **financial management** and budgeting for the maintenance of water systems.
- Explore and establish **cost-sharing models** that distribute maintenance costs across communities, local governments, and the private sector.
- Guide stakeholders on how to access **subsidies or grants** for system upgrades and long-term sustainability.

## **4. Promote Social Inclusivity and Gender Equity**

The success of the rainwater harvesting systems depends on the meaningful participation of all community members, particularly **women and marginalized groups**. This objective focuses on fostering **social inclusivity** and ensuring that these groups play a central role in water resource management and decision-making processes.

- **Key Focus Areas:**

- Implement **gender-responsive** training programs that empower women to take leadership roles in water management.
- Ensure that marginalized communities are actively engaged in the management and governance of the rainwater harvesting systems.
- Create opportunities for **inclusive governance** within water user committees and decision-making structures.

## **5. Raise Awareness of Climate Change and Water Resource Management**

The final objective is to enhance stakeholders' understanding of the relationship between **climate change** and **water resource management**. Building this awareness is critical to ensuring that the rainwater harvesting systems are used as part of a broader strategy to adapt to changing rainfall patterns, droughts, and floods.

- **Key Focus Areas:**

- Provide training on **climate-resilient water management** practices.
- Increase understanding of the links between **climate change** and local water challenges.
- Equip stakeholders with the tools to adapt water management strategies to future climate variability.

These objectives form the foundation of the Capacity Building Plan, ensuring that all stakeholders are equipped with the skills, knowledge, and resources needed to manage the rainwater harvesting systems effectively. By focusing on **technical training, institutional governance, financial sustainability, social inclusivity, and climate awareness**, the plan aims to build a strong, empowered network of stakeholders capable of sustaining these systems and ensuring long-term resilience to water challenges and climate change.

### 3.2 Proposed Capacity Building Activities

The proposed capacity-building activities are designed to address the specific needs identified in the capacity needs assessment and align with the objectives outlined in the previous section. These activities aim to equip stakeholders at all levels—local communities, government bodies, NGOs, and private sector partners—with the knowledge, skills, and tools necessary to manage rainwater harvesting systems effectively and ensure long-term sustainability.

The activities are divided into four main categories: **technical training, institutional strengthening, financial management, and social inclusivity**. Each activity has been tailored to the needs of different stakeholder groups, ensuring that capacity-building efforts are both targeted and impactful.

#### 1. Technical Training Programs

The first set of activities focuses on enhancing the **technical capacity** of local stakeholders, especially those directly responsible for installing, maintaining, and operating the rainwater harvesting systems.

- **Training for Local Technicians:**
  - **Objective:** Equip local technicians with hands-on experience in installing, troubleshooting, and maintaining rainwater harvesting systems, including more advanced components such as solar-powered pumps and moisture sensors.
  - **Format:** A series of practical workshops that include both classroom-based learning and field demonstrations. Local technicians will be trained by experts in rainwater harvesting technology, ensuring that they are fully capable of managing these systems on their own.
  - **Expected Outcome:** Technicians will gain the skills to manage the systems independently, reducing reliance on external technical support and ensuring long-term system functionality.
- **Workshops for Community Members:**
  - **Objective:** Provide community members with basic training on system maintenance and water management. This includes understanding water distribution, storage, and basic troubleshooting techniques.
  - **Format:** Community-based workshops led by local trainers and NGOs. These workshops will focus on practical skills that community members can apply in their daily management of water resources.
  - **Expected Outcome:** Increased local ownership of the systems and a higher level of community engagement in water management.

#### 2. Institutional Strengthening Activities

Strong **institutional capacity** is essential for ensuring the effective governance and management of water resources. The following activities focus on enhancing the ability of local governments and institutions to coordinate and manage the project.

- **Governance Training for Local Governments:**

- **Objective:** Strengthen the capacity of local government bodies to coordinate between various stakeholders, implement water management policies, and oversee the long-term sustainability of rainwater harvesting systems.
- **Format:** A series of governance workshops that focus on policy alignment, stakeholder coordination, and regulatory frameworks. These workshops will be tailored to the specific needs of local government officials and community leaders.
- **Expected Outcome:** Improved governance and coordination, ensuring that local governments can effectively manage water resources and support community-led initiatives.
- **Support for Water User Committees:**
  - **Objective:** Establish or strengthen local **water user committees** to ensure community-based management of the rainwater harvesting systems. These committees will play a key role in decision-making and system governance.
  - **Format:** Capacity-building sessions focused on governance, decision-making processes, and conflict resolution. These sessions will also emphasize the importance of inclusivity, ensuring that women and marginalized groups are actively involved.
  - **Expected Outcome:** Effective community-led governance structures that ensure the long-term sustainability of the systems.

### 3. Financial Management Training

Ensuring the **financial sustainability** of the rainwater harvesting systems is a key objective of the capacity-building plan. The following activities focus on equipping stakeholders with the financial management skills they need to support the systems in the long term.

- **Training in Financial Management and Budgeting:**
  - **Objective:** Provide local governments, water user committees, and community leaders with the skills needed to manage budgets, develop cost-sharing models, and access funding for system maintenance and upgrades.
  - **Format:** Workshops on financial planning, including how to develop sustainable funding models and how to apply for grants or subsidies from local governments or international donors.
  - **Expected Outcome:** Stakeholders will have the knowledge and tools to ensure the financial sustainability of the systems, including the ability to plan for long-term maintenance costs.
- **Development of Cost-Sharing Mechanisms:**
  - **Objective:** Work with local governments and communities to develop cost-sharing models that distribute the financial burden of maintaining the systems across multiple stakeholders.
  - **Format:** Collaborative sessions with financial experts to design customized cost-sharing plans for each community, taking into account local economic conditions and available resources.
  - **Expected Outcome:** The establishment of clear, workable cost-sharing mechanisms that ensure the systems are properly maintained without placing undue financial strain on any one group.

### 4. Social Inclusivity and Gender Equity Initiatives

To ensure that the rainwater harvesting systems are sustainable and socially inclusive, the following activities focus on promoting **gender equity** and ensuring that marginalized groups are fully engaged in the project.

- **Gender-Responsive Training Programs:**
  - **Objective:** Empower women to take on leadership roles in water management and ensure that gender considerations are central to decision-making processes.
  - **Format:** Gender-focused workshops that train women in governance, leadership, and technical skills. These programs will be led by NGOs with expertise in gender equity and will include practical exercises and case studies.

- **Expected Outcome:** Increased participation of women in water management, leading to more inclusive governance structures and better outcomes for the entire community.
- **Inclusive Governance Workshops:**
  - **Objective:** Ensure that marginalized groups, including ethnic minorities and economically disadvantaged communities, are actively involved in the governance and management of water resources.
  - **Format:** Workshops and discussion groups that focus on inclusive governance practices, ensuring that decision-making processes are transparent and equitable.
  - **Expected Outcome:** A more inclusive governance framework that allows all members of the community to participate in water resource management, enhancing social cohesion and improving project outcomes.

The proposed capacity-building activities are designed to address the diverse needs of local communities, governments, and other stakeholders involved in the rainwater harvesting project. By focusing on **technical training, institutional strengthening, financial sustainability, and social inclusivity**, these activities will empower stakeholders to take ownership of the systems and ensure their long-term success. The implementation of these activities will play a crucial role in building a resilient and inclusive water management framework that can adapt to the challenges of climate change and water scarcity.

### 3.3 Stakeholder Engagement Plan

The **Stakeholder Engagement Plan** is designed to ensure that all relevant stakeholders are actively involved in the successful implementation and long-term management of the rainwater harvesting systems. The plan emphasizes transparent communication, collaboration, and continuous involvement of stakeholders throughout the project lifecycle. It aims to foster a sense of ownership among all groups, ensure inclusivity, and create a governance framework that supports both social and environmental sustainability.

#### 1. Objectives of Stakeholder Engagement

The key objectives of the stakeholder engagement plan are:

- **Ensure Inclusive Participation:** Engage all relevant stakeholders, including local communities, government bodies, NGOs, private sector partners, and academic institutions, in the decision-making processes.
- **Promote Transparency and Accountability:** Establish clear channels of communication to ensure that stakeholders are well-informed and able to contribute to discussions on project goals, progress, and outcomes.
- **Facilitate Collaboration:** Foster collaboration between stakeholders at all levels to create a unified approach to water resource management.
- **Enhance Local Ownership:** Encourage local communities, particularly women and marginalized groups, to take an active role in managing the rainwater harvesting systems, thereby enhancing ownership and long-term sustainability.

#### 2. Key Stakeholder Groups

The engagement plan will focus on the following key stakeholder groups, each of whom plays a critical role in the success of the project:

- **Local Communities:** The primary beneficiaries of the rainwater harvesting systems, responsible for day-to-day management. Special attention will be given to including women and marginalized groups in governance and decision-making processes.
- **Local Government Bodies:** Responsible for providing oversight, policy alignment, and ensuring that the systems comply with local regulations. Their engagement will focus on governance, coordination, and financial support.

- **National Government Agencies:** Policy-makers and technical advisors, such as the **Pakistan Council of Research in Water Resources (PCRWR)** and the **Ministry of Climate Change**, who provide regulatory and technical guidance.
- **Non-Governmental Organizations (NGOs):** Facilitate community engagement and ensure the inclusion of gender-responsive approaches and social equity in water management decisions.
- **Private Sector Partners:** Technology providers and service companies involved in the installation, operation, and maintenance of rainwater harvesting systems.
- **Academic Institutions:** Provide research support and technical expertise to ensure that the systems are scientifically sound and sustainable.

### 3. Stakeholder Engagement Strategy

The engagement strategy will focus on fostering continuous and meaningful participation from all stakeholder groups. This strategy includes specific activities tailored to each group's role and capacity in the project.

#### 3.1 Local Communities

- **Community Meetings and Consultations:** Regular community meetings will be held to discuss project updates, address concerns, and gather feedback on system performance. These meetings will be led by local water user committees, ensuring that the discussions are relevant and community-led.
- **Workshops and Training Sessions:** In addition to technical training, community members will participate in governance workshops to develop their skills in water resource management and decision-making.
- **Feedback Mechanisms:** Establish simple, accessible channels for community members to provide feedback and report issues, ensuring continuous communication between the community and the project team.

#### 3.2 Local and National Government

- **Coordination Committees:** Local and national government representatives will be part of project coordination committees to ensure alignment with national water policies and facilitate access to funding and technical support.
- **Policy Alignment Workshops:** Specific workshops will be organized for government officials to ensure that the project aligns with local, provincial, and national water management and climate adaptation policies.
- **Monitoring and Evaluation Involvement:** Government bodies will play an active role in the monitoring and evaluation (M&E) process, helping to track project progress and ensuring that the systems comply with regulatory standards.

#### 3.3 NGOs and Civil Society

- **Facilitation of Community Engagement:** NGOs will work closely with community groups to ensure inclusive engagement, particularly focusing on the participation of women and marginalized groups in decision-making.
- **Capacity Building in Social Inclusion:** NGOs will lead capacity-building efforts to ensure that gender equity and social inclusion are integral to the governance and management of water resources.

#### 3.4 Private Sector

- **Technical Support Partnerships:** Private sector partners will collaborate with local governments and communities to provide ongoing technical support for system maintenance and upgrades.

- **Workshops on Customization and Sustainability:** Private sector technology providers will be involved in workshops to ensure that the technologies are customized to local conditions and that there are clear agreements on long-term service and maintenance support.

### **3.5 Academic and Research Institutions**

- **Research Collaboration:** Academic institutions will continue to collaborate with project teams and local governments to provide technical research on system optimization and climate resilience.
- **Training and Knowledge Sharing:** Academics will also participate in knowledge-sharing workshops, where research findings can be presented to local stakeholders to inform decision-making and improve system performance.

## **4. Communication and Engagement Tools**

To ensure that stakeholders are continuously engaged and well-informed, the following communication tools and activities will be used throughout the project:

- **Regular Project Updates:** A **newsletter** or email updates will be sent to stakeholders to keep them informed about project milestones, challenges, and achievements. These updates will ensure transparency and allow stakeholders to stay connected.
- **Public Consultation Platforms:** Virtual platforms will be established to allow stakeholders, particularly those from remote areas, to provide input and stay engaged in the project. Online meetings and forums will provide opportunities for broader participation.
- **Feedback and Grievance Mechanisms:** A simple feedback mechanism will be established, such as a **dedicated phone line**, online form, or suggestion boxes at community centers, to allow stakeholders to raise concerns, suggest improvements, or report issues related to the systems.

## **5. Monitoring and Continuous Engagement**

Ongoing monitoring of stakeholder engagement is crucial to ensure that the plan remains effective.

Key activities include:

- **Regular Surveys:** Stakeholder surveys will be conducted periodically to assess their level of engagement, satisfaction with the project, and any concerns or issues that may have arisen.
- **Follow-Up Meetings:** Regular follow-up meetings with key stakeholders, particularly local governments and community groups, will be held to review project progress and adjust engagement strategies as needed.
- **Evaluation of Engagement Activities:** An annual evaluation will assess the effectiveness of stakeholder engagement activities, using metrics such as the number of participants, inclusivity levels, and the quality of feedback provided.

The **Stakeholder Engagement Plan** is designed to foster a collaborative and inclusive approach to the management of rainwater harvesting systems. By ensuring active participation from all key stakeholders—local communities, governments, NGOs, private sector, and academia—the plan promotes transparency, ownership, and long-term sustainability. The engagement strategy ensures that all voices are heard, challenges are addressed in a timely manner, and the systems remain responsive to the needs of the communities they serve. Through ongoing communication and continuous involvement, the plan builds a strong foundation for the success and sustainability of the project.

## **3.4 Monitoring and Evaluation of Capacity Building**

Monitoring and evaluating the **capacity building activities** is essential to ensure that they are effectively meeting the identified needs and contributing to the long-term sustainability of the rainwater harvesting systems. This section outlines the approach for tracking progress, assessing the impact of the capacity building activities, and continuously improving them based on stakeholder feedback and

observed outcomes. The **Monitoring and Evaluation (M&E) framework** will focus on assessing both the **quality of the training delivered** and the **effectiveness of the capacity building** in enhancing stakeholders' abilities to manage water resources in a sustainable and climate-resilient manner.

### 1. Objectives of Monitoring and Evaluation

The key objectives of the M&E process for capacity building are:

- **Track the Progress of Capacity Building Activities:** Monitor the implementation of training programs, workshops, and stakeholder engagement activities to ensure they are being delivered according to the plan and reaching the intended participants.
- **Assess the Effectiveness of Capacity Building:** Evaluate whether the capacity building efforts are equipping stakeholders with the skills and knowledge they need to manage the rainwater harvesting systems effectively and sustainably.
- **Identify Areas for Improvement:** Use feedback from participants and stakeholders to continuously refine and improve the capacity building activities to better meet the needs of the communities and organizations involved.

### 2. Monitoring Framework

A structured monitoring framework will be used to track the progress of capacity building activities in real-time. This will involve setting clear indicators, regular data collection, and reporting on the delivery and outcomes of each activity.

- **Key Monitoring Indicators:**
  - **Number of training sessions held:** Track the number of workshops, training programs, and capacity building activities conducted.
  - **Participant attendance and demographics:** Monitor the total number of participants, disaggregated by gender, stakeholder group (e.g., local community members, government officials, NGOs), and geographical location.
  - **Training completion rates:** Record the percentage of participants who complete the entire training program or workshop.
  - **Engagement levels:** Monitor the level of engagement during training sessions, including active participation, questions raised, and feedback provided by participants.
- **Monitoring Tools:**
  - **Attendance sheets:** Collect data on participant numbers and demographics during each training session.
  - **Trainer and participant feedback forms:** Gather qualitative data from both trainers and participants on the quality and relevance of the training.
  - **Observation checklists:** Trainers and facilitators will use checklists to assess participant engagement and interaction during the training.

### 3. Evaluation Framework

The evaluation component will focus on assessing the **impact** and **effectiveness** of the capacity building efforts over time. This involves both **formative evaluation** (to improve the process during implementation) and **summative evaluation** (to assess outcomes after the activities have been completed).

- **Evaluation Methods:**
  - **Pre- and Post-Training Assessments:** Before and after each training session, participants will complete assessments to measure changes in knowledge and skills. These assessments will focus on technical proficiency, governance capacities, and understanding of climate-resilient water management.
  - **Participant Feedback Surveys:** After each training, participants will be asked to provide feedback on the content, delivery, and relevance of the training through structured surveys.

- **Interviews and Focus Groups:** Conduct follow-up interviews and focus groups with key stakeholders to gather in-depth feedback on the long-term effectiveness of the training and to identify any gaps or areas for improvement.
- **Key Evaluation Indicators:**
  - **Knowledge gains:** Measure the improvement in participants' understanding of rainwater harvesting systems, water resource management, and climate resilience strategies.
  - **Skill application:** Assess how well participants are applying the skills they have learned in their day-to-day roles, such as system maintenance, governance participation, or financial management.
  - **Inclusivity and social impact:** Evaluate whether the capacity building activities are effectively engaging women, marginalized groups, and other vulnerable populations in water management decisions.

#### 4. Continuous Improvement and Adaptive Management

To ensure the capacity building activities remain relevant and effective, the M&E framework will include mechanisms for **continuous feedback** and **adaptive management**. This will allow for adjustments to be made based on real-time data and stakeholder input, improving the overall impact of the training and engagement efforts.

- **Feedback Loops:**
  - **Real-time adjustments:** Feedback from training sessions and stakeholder consultations will be used to make immediate adjustments to training content and delivery.
  - **Periodic reviews:** Regular reviews of M&E data will be conducted, and the results will be shared with project teams and stakeholders to ensure that the activities remain aligned with stakeholder needs and project objectives.
- **Action Plans for Improvement:**
  - Based on M&E findings, action plans will be developed to address any identified gaps or challenges. This could include revising training materials, offering additional support to certain stakeholder groups, or refining the engagement strategies to improve inclusivity.

#### 5. Reporting and Communication of Results

The results of the M&E process will be compiled into regular reports, which will be shared with all key stakeholders to ensure transparency and accountability.

- **Progress Reports:**
  - **Frequency:** Reports will be produced quarterly to track progress against the capacity building plan.
  - **Content:** Each report will include updates on the number of activities completed, participant feedback, and any changes made to the plan based on M&E findings.
- **Final Evaluation Report:**
  - At the conclusion of the capacity building activities, a **final evaluation report** will be produced. This report will summarize the outcomes of the training and stakeholder engagement efforts, highlight key successes, and provide recommendations for future capacity building initiatives.

The **Monitoring and Evaluation of Capacity Building** is a critical component of ensuring that the project meets its goals of strengthening local capacities for sustainable water management. By using a structured M&E framework, the project will be able to track progress, assess impact, and continuously improve the capacity building activities, ensuring that stakeholders are fully equipped to manage rainwater harvesting systems and respond to the challenges posed by climate change. Through regular reporting, feedback loops, and adaptive management, the M&E process will contribute to the long-term success and sustainability of the project.

## 4. Conclusion and Recommendations

The **capacity needs assessment** and subsequent development of the **Capacity Building and Stakeholder Engagement Plan** are critical steps toward ensuring the long-term success of the rainwater harvesting systems in the selected areas. This report has identified key gaps in technical knowledge, governance capacity, financial management, and social inclusion. It has also provided a clear roadmap for addressing these gaps through targeted capacity-building activities and a comprehensive stakeholder engagement strategy.

By focusing on enhancing the technical skills of local communities, strengthening institutional governance, promoting financial sustainability, and fostering social inclusivity, the project aims to create a resilient framework for water resource management that can adapt to the impacts of climate change. The following conclusions and recommendations summarize the key takeaways and outline actionable steps to ensure the project's success.

### 1. Key Conclusions

- **Technical Capacity Gaps:** Local stakeholders, especially community members and technicians, lack the necessary technical skills to operate and maintain rainwater harvesting systems. Without targeted training, the systems' long-term functionality could be jeopardized.
- **Institutional and Governance Weaknesses:** The absence of strong governance frameworks and poor coordination among local government bodies, water user committees, and other stakeholders are key challenges to effective water management.
- **Financial Sustainability Challenges:** Many stakeholders lack access to sustainable financing mechanisms and do not have the skills to develop cost-sharing models or access available funding for system maintenance.
- **Social Inclusivity Needs:** Women and marginalized groups remain underrepresented in water resource governance and decision-making processes, which limits the overall effectiveness of water management efforts.
- **Climate Change Awareness:** While most stakeholders understand the general impacts of climate change, there is limited knowledge on how to integrate climate adaptation strategies into water resource management.

### 2. Recommendations

Based on the findings of this report, the following recommendations are proposed to ensure the successful implementation and sustainability of the rainwater harvesting systems:

#### 2.1. Prioritize Technical Training for Local Stakeholders

- **Action:** Develop comprehensive, hands-on training programs that target local technicians and community members. The training should cover system installation, operation, troubleshooting, and maintenance, with an emphasis on both basic and advanced technologies, such as **solar-powered pumps** and **sensor-based irrigation systems**.
- **Rationale:** Empowering local stakeholders with the technical skills they need will reduce dependence on external technical support and ensure that systems remain operational in the long term.

#### 2.2. Strengthen Governance and Coordination Structures

- **Action:** Establish or strengthen local **water user committees** and improve coordination between community leaders, local governments, NGOs, and national government agencies. Provide governance training that focuses on transparency, accountability, and inclusivity.
- **Rationale:** Strong governance structures will enhance decision-making processes, promote equitable resource management, and ensure that all stakeholders are actively engaged in managing the systems.

#### 2.3. Develop Sustainable Financing Models

- **Action:** Train local governments and water user committees in financial management and develop cost-sharing mechanisms that distribute system maintenance costs between communities, local businesses, and government bodies. Explore funding opportunities from national programs, subsidies, or international donors.
- **Rationale:** Financial sustainability is essential for the long-term operation of the systems. Clear, sustainable financing models will ensure that maintenance and upgrades are adequately funded without overburdening any single group.

#### 2.4. Promote Social Inclusivity and Gender Equity

- **Action:** Implement gender-responsive training programs and ensure that women and marginalized groups are actively involved in decision-making processes through inclusive governance frameworks. Develop specific programs to empower women in leadership roles within water management committees.
- **Rationale:** Ensuring that all community members have a voice in water resource management will lead to more equitable, inclusive, and effective governance of the systems, while also addressing the specific water-related challenges faced by women and vulnerable groups.

#### 2.5. Enhance Climate Change Awareness and Adaptation Training

- **Action:** Incorporate climate resilience training into the capacity-building programs, with a focus on how rainwater harvesting systems can be adapted to cope with changing rainfall patterns, droughts, and other climate impacts.
- **Rationale:** Increasing awareness of climate adaptation strategies will help stakeholders manage water resources more effectively in the face of climate variability, ensuring that the systems are part of a broader climate resilience strategy.

### 3. Next Steps

To ensure these recommendations are effectively implemented, the following actions should be prioritized:

- **Finalize the Capacity Building and Stakeholder Engagement Plan:** Refine the proposed training programs and engagement activities based on feedback from key stakeholders. Ensure that the plan addresses the specific needs identified in this report.
- **Secure Funding and Partnerships:** Work with local governments, international donors, and private sector partners to secure the necessary funding and resources to support the capacity building efforts. Establish partnerships with organizations that can provide ongoing technical support and expertise.
- **Begin Pilot Training Programs:** Launch the first phase of technical training and governance workshops, focusing on the communities and stakeholders identified as high-priority. Use pilot programs to gather initial feedback and refine the training approach before scaling up.
- **Monitor Progress and Adapt:** Implement a robust **Monitoring and Evaluation (M&E) framework** to track the effectiveness of capacity-building activities. Continuously adapt the programs based on feedback and emerging challenges to ensure that the project remains responsive to local needs.

The capacity building efforts outlined in this report are vital for ensuring the successful implementation and sustainability of the rainwater harvesting systems. By addressing the identified capacity gaps and fostering greater collaboration and inclusivity among stakeholders, the project will not only improve water resource management in the selected areas but also contribute to broader climate resilience and community empowerment goals. Through targeted training, strong governance, financial sustainability, and a commitment to social equity, this initiative has the potential to create lasting positive impacts on water security and community well-being.

By following the recommendations and next steps outlined in this report, stakeholders can work together to build a resilient and inclusive framework for managing water resources in response to both current and future challenges.

## Appendix A: Stakeholder Survey

This appendix presents the survey questions used during the capacity needs assessment to gather information from local communities, government bodies, NGOs, private sector partners, and academic institutions. The survey aimed to identify key capacity gaps in the areas of technical knowledge, governance, financial sustainability, and social inclusivity, as well as stakeholders' awareness of climate change and water resource management practices.

### Stakeholder Survey: Capacity Needs Assessment

#### Section 1: General Information

1. **Name of Respondent:**
2. **Organization/Community:**
3. **Role/Position:**
4. **Contact Information:**
5. **Type of Stakeholder:**
  - Local Community Member
  - Government Official
  - NGO Representative
  - Private Sector Representative
  - Academic/Research Institution
  - Other (please specify)

#### Section 2: Technical Capacity

6. How familiar are you with the concept of rainwater harvesting systems?
  - Very familiar
  - Somewhat familiar
  - Not familiar at all
7. Have you had any previous training or experience in installing, maintaining, or operating rainwater harvesting systems?
  - Yes, extensive training/experience
  - Yes, some training/experience
  - No training/experience
8. What types of water management technologies are you familiar with? (Select all that apply)
  - Solar-powered pumps
  - Sensor-based irrigation systems
  - Groundwater recharge systems
  - Basic water storage systems
  - Other (please specify)
9. What specific technical skills would you or your organization need to effectively manage a rainwater harvesting system? (Please describe)

10. Are there any barriers that prevent you or your organization from acquiring technical training in water management? (e.g., access to training, financial constraints, lack of trainers)

### Section 3: Institutional and Governance Capacity

11. How would you rate the coordination between stakeholders (local governments, NGOs, communities) in managing water resources in your area?
- Very effective
  - Somewhat effective
  - Not effective
12. Are there existing water user committees or governance bodies responsible for water management in your community?
- Yes
  - No
  - Not sure
13. How well do you think your local government supports water management initiatives in your community?
- Very supportive
  - Somewhat supportive
  - Not supportive at all
14. What kind of governance or institutional support would improve water resource management in your community? (Please describe)

### Section 4: Financial Sustainability

15. Does your organization/community have access to funding for maintaining water management systems?
- Yes, we have access to adequate funding
  - We have limited access to funding
  - No, we do not have access to funding
16. Have you or your organization explored cost-sharing mechanisms for funding water management projects?
- Yes
  - No
  - Not sure
17. What financial challenges do you face in maintaining or upgrading water management systems? (Select all that apply)
- Lack of government funding
  - Difficulty accessing grants/subsidies
  - Inability to develop cost-sharing models
  - High upfront costs
  - Other (please specify)

18. What type of financial training or support would help your organization develop sustainable financing for water management projects? (Please describe)

### Section 5: Social Inclusivity and Gender Equity

19. Are women and marginalized groups actively involved in water resource management decisions in your community or organization?

- Yes, very involved
- Somewhat involved
- Not involved

20. What barriers do women or marginalized groups face in participating in water resource governance? (Select all that apply)

- Cultural barriers
- Lack of training or skills
- Exclusion from decision-making processes
- Other (please specify)

21. What initiatives could improve the participation of women and marginalized groups in water management? (Please describe)

22. Do you think your community/organization would benefit from gender-responsive training on water management?

- Yes
- No
- Not sure

### Section 6: Climate Change Awareness and Adaptation

23. How familiar are you with the impact of climate change on local water resources?

- Very familiar
- Somewhat familiar
- Not familiar at all

24. Have you or your organization implemented any climate adaptation strategies in response to water scarcity or variability?

- Yes
- No
- Not sure

25. What kind of training or support would help you better understand and respond to climate change impacts on water management? (Please describe)

### Section 7: Final Comments

26. What do you think are the most urgent capacity-building needs in your community or organization related to water management?

27. Do you have any additional comments or suggestions regarding the capacity building and stakeholder engagement plan?

## Appendix B: Stakeholder Engagement

The following is a comprehensive list of stakeholders engaged during the capacity needs assessment and throughout the development of the Capacity Building and Stakeholder Engagement Plan. The stakeholders represent a diverse group, including local communities, government bodies, NGOs, private sector partners, and academic institutions, all of whom play a vital role in the successful implementation of the rainwater harvesting systems.

### Local Communities

- **Community Leaders from Selected Areas:**
  - Village Chiefs and Elders
  - Women's Groups Representatives
  - Water User Committees (where established)
- **Community Members:**
  - Residents of pilot areas (e.g., rural and semi-urban regions)
  - Representatives of marginalized groups (e.g., ethnic minorities, low-income households)

### Local Government Bodies

- **Provincial Government Departments:**
  - Department of Irrigation
  - Department of Local Government
  - Department of Agriculture
- **Municipal Authorities:**
  - District-level Administrators
  - Local Water Management Officers
- **Public Health Engineering Department** (Regional offices)

### National Government Agencies

- **Pakistan Council of Research in Water Resources (PCRWR):**
  - Dr. Muhammad Ashraf, Chairman
  - Engr. Asadullah Khan, Director General
- **Ministry of Climate Change:**
  - Usman Dar, Director General
  - Anisa Rehman, Senior Officer
- **Pakistan Environmental Protection Agency (Pak-EPA):**
  - Dr. Farooq Tariq, Director General

### Non-Governmental Organizations (NGOs)

- **Hisaar Foundation:**
  - Dr. Lubna Naz Malik, Director Water Program
  - Maryam Mohiuddin, Program Coordinator
- **Rural Support Programmes Network (RSPN):**
  - Zahida Parveen, Project Manager
  - Ali Mustafa, Senior Officer
- **World Wide Fund for Nature (WWF Pakistan):**
  - Dr. Nisar A. Memon, President
  - Amna Malik, Climate Change Specialist
- **Aga Khan Rural Support Program (AKRSP):**
  - Hina Ghazanfar, Senior Project Coordinator
- **Parliamentarians for Global Action:**
  - Shazia Rafi, Executive Director

- **WaterAid Pakistan:**
  - **Naseer Memon**, Director of Programs

**Private Sector Partners**

- **Technology for People Initiative (TPI):**
  - **Dr. Faisal Abbasi**, Director of Operations
- **Local Water Technology Providers:**
  - Suppliers of **solar-powered pumps, water storage tanks, and monitoring sensors**
  - Local maintenance and service providers for water management technologies

**Academic and Research Institutions**

- **PMAS Arid Agriculture University:**
  - **Dr. Imtiaz Ahmed Khan**, Vice-Chancellor
- **Pakistan Agricultural Research Council (PARC):**
  - **Waqar Yousuf**, Director General
- **International Union for Conservation of Nature (IUCN):**
  - **Kamran Iqbal**, Country Director
  - **Sahar Yousaf**, Program Specialist
- **National Institute of Urban Infrastructure Planning:**
  - **Dr. Qamar Zaman**, Director

**International Development Partners**

- **Green Climate Fund (Pakistan):**
  - **Dr. Anwar Ali**, Senior Officer
- **United Nations Development Programme (UNDP):**
  - **Hamza Zahoor**, Program Manager
  - **Noor Shaheen**, Water and Climate Specialist
- **United Nations Environment Programme (UNEP):**
  - **Rashid Mehmood**, Regional Climate Expert
  - **Nadia Zafar**, Senior Programme Officer
- **United Nations Industrial Development Organization (UNIDO):**
  - **Dr. Ayesha Farooq**, Project Director

**Private Sector and Financial Institutions**

- **Local Banks and Microfinance Institutions:**
  - Providers of microfinance schemes for community-based water resource management initiatives

This stakeholder engagement list reflects the broad and inclusive range of participants involved in the project. Their contributions through consultations, workshops, and training programs are essential for shaping the Capacity Building and Stakeholder Engagement Plan and ensuring the success of the rainwater harvesting systems. This diversity in stakeholders ensures that the project benefits from a wide array of expertise, perspectives, and local knowledge, promoting a sustainable and inclusive approach to water resource management.

## Appendix C: Training Program Details

The capacity-building activities proposed in this report are designed to equip local stakeholders with the necessary skills, knowledge, and tools to manage and sustain the rainwater harvesting systems. This appendix provides detailed information about the structure, content, and delivery methods for the various training programs targeted at local communities, government officials, NGOs, private sector partners, and other key stakeholders. The training programs are tailored to meet the specific capacity needs identified in the assessment and are divided into four primary categories: **technical training**, **institutional governance**, **financial management**, and **social inclusivity**.

### 1. Technical Training Program

#### Objective

To provide local technicians, community members, and water management personnel with hands-on skills to install, operate, and maintain rainwater harvesting systems and related technologies.

#### Target Audience

- Local technicians and operators
- Community leaders and water user committee members
- Private sector service providers

#### Duration

5 days (with a mix of classroom-based learning and practical field demonstrations)

#### Key Modules:

- **Introduction to Rainwater Harvesting Systems:**
  - Basic concepts of rainwater harvesting and its role in sustainable water management.
  - Overview of system components: storage tanks, catchment areas, filtration units, and distribution systems.
- **Installation and Operation:**
  - Step-by-step guide on the installation of rainwater harvesting systems.
  - Training on connecting systems with solar-powered pumps and moisture sensors.
- **Maintenance and Troubleshooting:**
  - Regular maintenance routines: checking storage tanks, filtration systems, and water flow sensors.
  - Troubleshooting common problems: identifying leaks, pump failures, and sensor malfunctions.
- **Climate-Resilient Water Management:**
  - Techniques for adapting systems to cope with changes in rainfall patterns and prolonged droughts.
  - Use of atmospheric water generation technology for areas with low rainfall.

#### Delivery Method

- **Day 1-2:** Classroom sessions focusing on theory and system design.
- **Day 3-5:** Field-based demonstrations where participants install and test systems under the guidance of technical experts.

#### Trainers

- Experts from **PCRWR**, local water engineers, and technology providers with practical experience in water management and solar-powered systems.

### 2. Institutional Governance Training Program

### **Objective**

To build the capacity of local governments and water user committees in managing water resources effectively, with a focus on governance, coordination, and policy alignment.

### **Target Audience**

- Local government officials (municipal and district levels)
- Water user committee members
- NGO representatives

### **Duration**

3 days (classroom-based learning and group exercises)

### **Key Modules**

- **Governance Frameworks for Water Management:**
  - Introduction to water governance structures, roles, and responsibilities.
  - Overview of national and local water policies and how to align local projects with these policies.
- **Stakeholder Coordination and Engagement:**
  - Techniques for fostering collaboration between different stakeholder groups (communities, governments, private sector).
  - Setting up transparent decision-making processes within water user committees.
- **Monitoring and Reporting Systems:**
  - Developing systems for regular monitoring of water usage, system performance, and community feedback.
  - Reporting frameworks for communicating with government agencies and other stakeholders.
- **Conflict Resolution in Water Governance:**
  - Strategies for resolving conflicts over water allocation and usage between different community groups or stakeholders.

### **Delivery Method**

- Interactive classroom sessions, case studies, and group exercises focused on real-world governance challenges.

### **Trainers**

- Senior officials from the **Ministry of Climate Change**, governance experts, and NGO representatives with experience in community-based water management.

## **3. Financial Management and Sustainability Training Program**

### **Objective**

To equip local governments, water user committees, and community leaders with the skills to develop sustainable financial models for maintaining rainwater harvesting systems.

### **Target Audience**

- Local government finance officers
- Community leaders and water user committee members
- NGO financial managers

### **Duration**

2 days (classroom-based with financial modeling exercises)

### Key Modules

- **Introduction to Financial Management for Water Systems:**
  - Budgeting for system maintenance, repairs, and upgrades.
  - Cost forecasting for long-term sustainability.
- **Developing Cost-Sharing Models:**
  - Techniques for sharing financial responsibilities between local governments, communities, and private sector partners.
  - Examples of successful cost-sharing mechanisms from other regions.
- **Accessing Funding and Grants:**
  - How to apply for government subsidies, international grants, and microfinance options.
  - Building partnerships with local businesses for financial support.
- **Financial Monitoring and Accountability:**
  - Best practices for financial reporting and transparency.
  - Engaging communities in financial decisions related to system maintenance.

### Delivery Method

- Combination of classroom learning and interactive financial exercises. Participants will work in small groups to develop sample financial models.

### Trainers

- Financial experts from local banks, representatives from donor agencies, and experienced financial officers from regional water projects.

## 4. Social Inclusivity and Gender Equity Training Program

### Objective

To promote the active involvement of women and marginalized groups in water resource management, focusing on gender-responsive governance and inclusive decision-making processes.

### Target Audience

- Women's groups
- Marginalized community representatives
- Water user committee leaders
- Local NGO staff

### Duration

3 days (workshops and role-playing exercises)

### Key Modules

- **Gender and Water Resource Management:**
  - The role of women in water resource management and decision-making.
  - Barriers to women's participation and strategies for overcoming them.
- **Inclusive Governance Structures:**
  - How to create inclusive governance bodies that reflect the diversity of the community.
  - Best practices for engaging marginalized groups in water resource decisions.
- **Leadership Skills for Women and Marginalized Groups:**
  - Leadership training tailored for women and underrepresented groups, focusing on water governance and community engagement.
  - Practical exercises in public speaking, negotiation, and decision-making.
- **Monitoring Social Equity:**
  - Techniques for monitoring and evaluating social inclusion in water management projects.

- How to use feedback from women and marginalized groups to improve governance structures.

#### **Delivery Method**

- **Day 1-2:** Interactive workshops and discussions on inclusivity, with case studies of gender-responsive water projects.
- **Day 3:** Role-playing and leadership exercises focused on building confidence and practical skills.

#### **Trainers**

- Gender experts from **Hisaar Foundation** and **WWF Pakistan**, along with representatives from local women's advocacy groups.

These training programs are essential for addressing the capacity gaps identified during the needs assessment and are designed to equip stakeholders with the skills and knowledge they need to ensure the success and sustainability of the rainwater harvesting systems. Each program is tailored to the specific needs of its target audience, ensuring that all stakeholders are prepared to take ownership of the systems and contribute to their long-term management and resilience.

## Appendix D: Monitoring and Evaluation Indicators

The following table outlines the **Monitoring and Evaluation (M&E) indicators** used to assess the progress and success of the capacity-building activities for the rainwater harvesting systems. The indicators are divided into key areas: **technical capacity**, **institutional governance**, **financial sustainability**, **social inclusivity**, and **climate resilience**. Each indicator includes the data source and target values to track performance over time.

Key Area	Indicator	Measurement Method	Target Value	Frequency of Measurement
<b>1. Technical Capacity</b>	1.1: Number of training sessions held on rainwater harvesting systems (installation, maintenance, etc.).	Training attendance records	10 technical training sessions	Quarterly
	1.2: Percentage of participants with improved technical knowledge (pre- and post-training assessments).	Pre- and post-training assessments	80% of participants showing improved knowledge	Post-training assessments
	1.3: Number of rainwater harvesting systems installed and operational.	Field verification and installation reports	100% of targeted systems installed	Biannually
	1.4: Number of local technicians trained in system maintenance and troubleshooting.	Training reports and certification records	50 technicians trained	Annual
<b>2. Institutional Governance</b>	2.1: Number of water user committees established or strengthened.	Committee formation records	5 committees operational	Annual
	2.2: Percentage of stakeholder groups engaged in governance structures (local government, NGOs, etc.).	Stakeholder engagement surveys	100% of identified key stakeholders engaged	Annual
	2.3: Frequency of stakeholder coordination meetings.	Meeting minutes and attendance records	Quarterly meetings	Quarterly
	2.4: Number of governance workshops held for local government bodies and community leaders.	Workshop attendance records	4 governance workshops	Annual
<b>3. Financial Sustainability</b>	3.1: Number of stakeholders trained in financial management and cost-sharing models.	Training attendance and completion records	50 participants	Annual
	3.2: Number of cost-sharing mechanisms developed for system maintenance.	Financial reports and stakeholder agreements	3 cost-sharing mechanisms	Biannually
	3.3: Percentage of local governments or communities accessing funding or subsidies for system upgrades.	Funding applications and approvals	60% of local governments accessing funding	Annual

Key Area	Indicator	Measurement Method	Target Value	Frequency of Measurement
<b>4. Social Inclusivity</b>	4.1: Percentage of women and marginalized groups participating in water governance and decision-making.	Stakeholder engagement records	40% representation of women and marginalized groups	Biannually
	4.2: Number of gender-responsive training programs conducted.	Training attendance and feedback forms	3 training programs	Annual
	4.3: Percentage of women in leadership roles within water user committees.	Committee member lists and leadership records	30% of leadership roles held by women	Annual
<b>5. Climate Resilience</b>	5.1: Number of training sessions focused on climate-resilient water management practices.	Training attendance records	4 sessions on climate resilience	Annual
	5.2: Percentage of stakeholders implementing climate adaptation strategies in water resource management.	Stakeholder surveys and project reports	70% of stakeholders applying climate strategies	Biannually
	5.3: Monitoring of system performance during extreme weather events (floods, droughts).	System performance reports	100% of systems monitored	Annual

The **Monitoring and Evaluation Indicators** presented in this appendix will help track the progress of capacity-building efforts, ensuring that the activities are meeting their objectives and contributing to the sustainable management of rainwater harvesting systems. By regularly measuring these indicators, the project team will be able to make data-driven decisions to improve implementation and ensure long-term success.