

iCARE Innovation Fund

Upscaling Irrigation and Climate Advisory Services through Citizen Science

Six Monthly Progress Report

Reporting period: Jan– June 2024

Prepared by: Bareerah Fatima, Director, PCRWR

Contents

1. Project Information.....	3
2. Summary of the Achievements	4
3. Summary of Project Beneficiaries	6
4. Performance Outcome Mapping.....	7
5. Partnership	10
6. Sustainability.....	11
7. Communication and Knowledge Management.....	12
8. Challenges and Risks	13
9. Lesson Learnt.....	14
Annex 1: Records of Events	15
Annex 2: Event reports/minutes, Learning documents, Knowledge products, Communication products or other documents	16
Annex 3: Results Framework.....	23

1. Project Information

Project Title:	Upscaling irrigation and climate advisory services through citizen science
Project Code:	WBCAR
Partner Organisation:	Inara Technologies (Pvt) Ltd and Pakistan Council of Research in Water Resources (PCRWR)
Reporting Period:	1 st January to 30 th June, 2024
Date of Submission:	30 th June 2024
Contact Name:	Bareerah Fatima
Contact Position:	Director
Contact Email Address:	breerahftm@gmail.com
Contact Telephone Number:	+92519101285, +923006757257
Contact Skype:	
Status of project progress in this reporting period	<input type="checkbox"/> Significant delay <input type="checkbox"/> Delay <input checked="" type="checkbox"/> On Track
Report sign Off	<input checked="" type="checkbox"/> I have reviewed all the information provided for each section including number of beneficiaries. The information provided for each section of the report is complete. Name: Faisal Waheed Designation: Director, Inara Technologies

2. Summary of the Achievements

Summary

The project achieved significant milestones through strategic site selection and farmer engagement across diverse provinces, focusing on areas with notable agricultural activity and climate vulnerability. This phase led to the selection of 144 farmers as citizen scientists, chosen based on education, gender, age, and willingness to participate. These farmers were organized into cohesive clusters and provided with smartphones and weather gadgets, including temperature and humidity sensors, rain gauges, anemometers, and barometers, to facilitate data collection.

Technological advancements were a cornerstone of the project, marked by the development of a cross-platform mobile application and a robust backend database using Flutter, Django, and PostgreSQL. This system emphasized security, scalability, and user-friendliness, ensuring efficient data management and real-time accessibility.

Training and empowerment efforts were robust, with 11 targeted training sessions conducted across locations such as Peshawar, Sargodha, Sheikhpura, Sahiwal, Toba Tek Singh, Tandojam, and Bahawalpur. These sessions equipped farmers with the necessary skills to use weather monitoring gadgets and the ICAS Data app, highlighting the project's commitment to participatory science and farmer empowerment. Pre-training feedback from farmers, covering farming practices and technological proficiency, was collected to tailor the training sessions to meet their specific needs.

The project also introduced improved and customized irrigation advisory services (irrigation scheduling information) accessible to both registered citizen scientists and non-registered citizens. These services included a 5-day climate forecast providing information on maximum and minimum temperatures, wind speed, and rainfall. An interactive irrigation advisory service allowed farmers to select their district and crops to generate customized advisory messages in Urdu, delivered through the app.

Collaborations with key stakeholder through engagement meetings was another key achievement, with two consultative meetings held to gather feedback on ICAS and explore further engagement and potential linkages with existing programs. The project engaged the Plant Disease Research Institute, Department of Agricultural Research in Tandojam, resulting in a letter of endorsement from the focal person nominated by the Government of Sindh.

Surveys and assessments were conducted, including post-training feedback surveys in seven out of nine project districts and a preliminary governance questionnaire. The project completed the improved ICAS access for farmers, making it available to general users as well. These accomplishments reflect the project's strategic planning, farmer empowerment, technological innovation, and effective stakeholder engagement, all aimed at enhancing agricultural productivity and climate resilience.

The project has made significant progress in integrating climate advisory services into the ICAS Data App, with representatives from five government agencies, two academic institutions, and one private sector organization gaining access to the solution. This access included a comprehensive walkthrough of the application and an overview of the data generated by the system. As a result,

farmers participating as citizen scientists across nine districts have begun receiving enhanced irrigation and climate advisory services, marking a significant advancement in the project's objectives.

Promotional materials have been developed and disseminated through the Agriculture Departments of Punjab and Khyber Pakhtunkhwa, leading to a focused impact assessment of the upgraded ICAS usage by farmers in seven targeted districts. This assessment reached out to 110 citizen scientists, providing valuable insights into the system's effectiveness. The development of an upscaling plan was initiated at the end of the pilot phase in August 2022. Two consultative workshops, held in August 2022 and May 2023, gathered public and private sector organizations to plan and discuss the upscaling concept. Additionally, a virtual meeting with nine professionals from provincial government organizations and academia was conducted on May 17, followed by an in-person meeting on June 12, attended by 18 participants from various sectors. These meetings helped shape the initial governance plan, supported by post-training feedback surveys conducted with 110 citizen scientists from several districts.

The project has conducted 11 training sessions, with more scheduled through the end of 2024. To date, 248 individuals have downloaded the app, including 144 citizen scientists, and a webpage for citizen scientist interaction has been established. Training has been provided to 144 citizen scientists, comprising 111 males and 33 females, and two meetings have been held with government agency representatives. Knowledge products and training materials have been distributed to these citizen scientists, who will also have access to short documentaries about the project.

Gender mainstreaming is a key focus, with approximately 25% of citizen scientists being female, and a dedicated site for women established in the Bahawalpur district. The innovation team is notably inclusive, with women comprising 46% of its members. The project emphasizes inclusive participation, adhering to cultural norms while promoting gender equity across activities.

Looking ahead, the project aims to launch a nationwide promotional campaign to encourage farmers and stakeholders to download and use the ICAS app. Strengthening stakeholder engagement is crucial to foster ownership and commitment to the solution. Comprehensive feedback sessions will be conducted with farmers, complemented by the development of instructional videos and interactive guides to enhance understanding and utilization of the app. The project will also complete and disseminate the remaining knowledge products and finalize a comprehensive governance framework to ensure the long-term sustainability, upscaling, and impact of the ICAS solution.

3. Summary of Project Beneficiaries

Direct Beneficiaries

The project involved a wide range of beneficiaries, including national and local government agencies, NGOs, private companies, universities, and international organizations. Nationally, it worked with the Pakistan Meteorological Department (PMD) and the Pakistan Agricultural Research Council (PARC). Locally, it included provincial departments like the Punjab Agriculture Department, Sindh Agriculture Extension Department, and KP Agriculture Extension Department. The project also partnered with private sector companies like Fauji Fertilizer Company (FFC) and educational institutions such as the National University of Science and Technology (NUST) and the University of Arid Agriculture Rawalpindi. Additionally, it involved international and regional organizations and individual farmers, including 144 citizen scientists, made up of 111 males and 33 females, from different communities.

The project provided several services and outputs to improve irrigation and climate advisory services. It engaged with these beneficiaries to build partnerships that could help expand and sustain the project. Consultative workshops and meetings were held to gather feedback on the innovation and governance plan, encouraging collaboration among stakeholders. The project aimed to integrate its irrigation and climate advisory services with existing extension services to reach more farmers. This integration enhanced current agricultural practices by offering advanced, automated advisory systems.

The project introduced the concept of citizen science to build trust and encourage interaction between farmers and scientists. This approach empowered farmers and ensured that the services provided were practical and relevant. The project also focused on inclusivity by providing opportunities for women and young people to participate in the science project. By involving a diverse group of stakeholders and focusing on community-based solutions, the project aimed to create a lasting impact on agricultural practices and improve resilience to climate change.

Indirect Beneficiaries

The project indirectly benefited various groups, including the Provincial Irrigation Departments, such as the Sindh Irrigation and Drainage Authority (SIDA). Other indirect users included general farmers connected to the participating citizen scientists or those located in the target districts. Development agencies interested in innovative solutions to enhance community services also benefited from the project. Additionally, consumers of Fauji Fertilizer Company products were impacted. The project reached a broader audience, with 248 downloads of its app from the Apple Store and Google Play Store, indicating widespread interest and engagement from general users.

4. Performance Outcome Mapping

Table 2: Implementation progress as of 30th June 2024

Budget Line Item Description	Approved budget (in US\$)	Actual expenditure in US\$	Target	Result/achievement
Outcome 1: Sustainability and Upscaling of Irrigation and Climate Advisory Services through Citizen Science				
Output 1.1 Number of platforms where promotion material is developed and disseminated.			2 platforms	Promotion material was developed and disseminated across two platforms of the Agriculture Departments of Punjab and Khyber Pakhtunkhwa provinces.
Activity 1.1.1: On the basis of citizen science data, refining the advisory services on the basis of target users (through advertisement, in-field sessions, and farmer days)	30,000	Nil	Improved advisory available for use	Improved advisory services based on farmers' feedback. The part of its promotion through advertisement remains.
Activity 1.1.2: Enlisting all the interested users including the citizen scientist in the advisory services	15,000	4500	144 users	144 citizen scientists using the advisory services. Engaged the technical team for longer period of time. 74 general public using the advisory services. This activity is linked to the increased number of users as per activity 1.1.1.
Activity 1.1.3: Identifying cost-effective means for disseminating the messages	15,000	2,000	1 platform (was due in July)	In-app interactive climate and irrigation advisory service is provided in ICAS Data App.
OUTPUT 1.2 Impact assessment of upgraded ICAS use by the farmers in the target districts.			90 farmers	Carried out an impact assessment of upgraded ICAS usage by farmers

				in the seven target districts out of nine reaching out to 110 farmers
Activity 1.2.1: Through feedback, determining how effectively farmers are using ICAS (through regular visits and communication with farmers)	20,000	3,000	A report due in October	Feedback survey completed in 7 districts out of 9 districts.
Activity 1.2.2: Determining the level of monetization to sustain the advisory services	10,000	Nil	A report due in November	Preliminary feedback is collected as part of Activity 1.2.1, detailed meetings with line agencies are planned for sustainability and upscaling of the advisory services.
Activity 1.2.3: Collecting “pitching impacts” from the users to scale out the advisory services	10,000	Nil	A report due in December	Developed a plan to conduct interviews in August
Output 1.3 Number of people participating in supported events (by participant category, sex, year, theme, country)			90 persons	30 participants in the 2 consultative meetings 110 farmers in post-training feedback (25 female)
Activity 1.3.1: Draft a governance plan for scaling up the citizen science concept and share its key elements with beneficiary farmers. After their feedback finalize the plan	20,000	Nil	1 report due in December	Work on governance plan has started, baseline question and answers were part of activity 1.2.1. More detailed information will be collected in the upcoming months.
OUTCOME 2: Popularizing the concept of “citizen science” for climate change adaptation				
Output 2.1: Number of citizens using citizen science data collection app			131 citizens	218 people have downloaded the app, including 144 citizen scientists
Activity 2.1.1: Upgradation of the citizen science App and its availability for the general public	20,000	10,000	Upgradation on App	Completed
Activity 2.1.2: Upgradation of citizen science database and development of a web dashboard allowing the interaction of citizens with data	20,000	10,000	Upgradation of database and web dashboard	Completed

Output 2.2: Number of people trained (in person) (by sex, country, topic, year, participant category)			131 persons	144 citizen scientists have been trained, comprising 110 males and 34 females
Activity 2.2.1: Development of training models for the citizen scientist	10,000	10,000	Training modules	Completed
Activity 2.2.2: Shortlisting the districts facilitators for guiding the citizens	10,000	5,000	Selection of facilitators	Completed
Activity 2.2.3: Training and gadget distribution to the citizens	40,000	40,000	Procurement of gadgets and training	Completed
Output 2.3: Number of (in-person) and virtual meetings held with the representatives of government agencies.			2 meetings	Completed
Activity 2.3.1: Consultative workshops involving provincial government organizations and explaining them the project concept	21,000	2,000	2 workshops	Completed
Activity 2.3.2: Developing collaborations with provincial government organizations as one of the beneficiaries	9,000	4500	Focal persons and meetings	Completed for the current half, 4 more meetings are planned during next six month.
Output 2.4a: Number of knowledge products developed			1 knowledge product	Developed 1 knowledge product on Training material
Output 2.4b: Number of people/organizations provided with knowledge products (by recipient category, type of knowledge product, country, theme)			131 persons	Provided to 144 persons
Total	250,000	91,000		

5. Partnership

The partnership is a key driver in achieving the anticipated outcomes of the project, which include the sustainable scaling of advisory services and the promotion of citizen science. Recognizing this, the project aimed to build robust partnerships with relevant stakeholders from both the public and private sectors.

In the first half of the project, the focus was on improving the ICAS (Irrigation and Climate Advisory Services) and building the capacity of citizen scientists. Despite this focus, the project successfully identified and engaged key partners from federal and provincial governments, the private sector, and academia.

During this period, stakeholders were introduced to the innovation by downloading the ICAS app on their mobile devices and exploring its features. They also interacted with citizen scientists involved in the project, gaining firsthand experience. Two stakeholder meetings were conducted, and some stakeholders visited project sites to gather feedback from citizen scientists. A significant endorsement came from a key stakeholder in Sindh, who provided a letter of support for the project.

The project aims to increase the frequency of stakeholder engagements in the remaining time period. Additionally, the ICAS is ready to be promoted through the existing platforms of the Agriculture Extension Departments of Punjab and Khyber Pakhtunkhwa (KP) provinces.

The overall aim of establishing these partnerships is to scale up and sustain the innovation. Through these efforts, we have strengthened partner capacities, improved mutual accountability, and enhanced communication. These partnerships are crucial for influencing and ensuring the sustainability of the initiative.

6. Sustainability

The primary objective of the project is to upscale the Irrigation and Climate Advisory Service (ICAS) in the region and establish workable options for its sustainability. To achieve this goal, the project team developed a comprehensive strategy that includes identifying key stakeholders and deploying a co-development approach through workshops and interviews.

A detailed questionnaire was created for both farming communities and other stakeholders. The questions focused on several key areas: Understanding Needs and Expectations, Leveraging Citizen Science, Enhancing Data Integration and Advisory Services, Exploring Financial Sustainability, and Fostering Partnerships and Collaborations.

Over the past six months, feedback was gathered from seven out of the nine targeted districts, involving over 100 citizen scientists and key stakeholders during two stakeholder meetings. This feedback provided valuable insights into the diverse needs and expectations of the various stakeholders.

Based on the collected feedback, the project team is in the process of drafting a Governance Plan. This plan will outline strategies for achieving financial sustainability and fostering partnerships while aligning with stakeholder expectations. Once the draft is complete, it will be shared with stakeholders for further refinement to ensure it is comprehensive and practical.

Key results achieved in the last six months include:

1. **Enhanced Stakeholder Engagement:** Successful engagement with key stakeholders from different sectors through structured workshops and meetings, fostering a sense of ownership and collaboration.
2. **Comprehensive Data Collection:** Collection of extensive feedback from a significant number of citizen scientists and stakeholders, providing a strong foundation for the governance plan.
3. **Development of a Governance Plan:** Progress towards a draft governance plan that will serve as a roadmap for achieving financial sustainability and strengthening partnerships.
4. **Promotion of ICAS:** Steps taken to promote ICAS through existing platforms of Agriculture Extension Departments in Punjab and KP provinces, ensuring broader reach and impact.

The overall aim is to co-develop a governance plan that not only ensures financial sustainability but also fosters long-term partnerships. This plan will be crucial in maintaining the momentum of the project and ensuring its benefits are sustained well into the future.

7. Communication and Knowledge Management

Table 3: Communication and Knowledge products activity and progress achieved

Related activity number	Communications Activity. Strategy/Tactic	Related communications or Knowledge product	Impact /Change perceived. Big or Small wins. Numbers (If any)
1.1.1, 1.1.2, 1.1.3, 2.1.1	Play store/App store	ICAS Application	248 downloads to date
1.2.1, 2.2.3	WhatsApp groups for each district and female citizen scientist	Use of ICAS, training, feedback, awareness, troubleshooting	Better communication
2.3.1	Leaflet	Concept note	Improved understanding
1.2.1, 2.1.1, 2.2.1, 2.2.3	YouTube channel (@Farmer-researcherLink)	ICAS video, ICAS training modules	Subscription, sharing, feedback, awareness

8. Challenges and Risks

During the reporting period, the implementation team faced several challenges and adopted various mitigation measures to address them:

1. **Site Relocation Due to External Factors:** The law and order situation in Quetta necessitated relocating the project site to Bahawalpur. This unforeseen change, while initially disruptive, resulted in the establishment of a dedicated site for women, thereby enhancing gender balance within the project. This instance demonstrates how unforeseen challenges can contribute positively to project outcomes.
2. **Network Connectivity Issues:** Network connectivity problems at training venues hindered the effectiveness of hands-on training sessions on the mobile app. To mitigate this, the team identified and prepared alternative venues with better connectivity for future training sessions. Additionally, they provided offline training materials to ensure participants could continue learning despite connectivity issues.
3. **Exclusion of Farmers Due to Selection Criteria:** Some farmers were initially not selected due to strict selection criteria. To address this, the project team reviewed and adjusted the criteria to be more inclusive, allowing additional farmers to participate in the program. This ensured broader community involvement and support for the project.
4. **Delayed Response from Provincial Governments:** Obtaining nominations of focal persons from relevant provincial government departments was delayed due to prolonged bureaucratic processes. To mitigate this, the project team engaged in continuous follow-up and maintained regular communication with government officials to expedite the process.
5. **Distrust in Existing Government Programs:** Farmers generally exhibited distrust towards existing provincial government programs. To build and maintain their trust, the project team established a continuous coordination mechanism, ensuring transparent communication and demonstrating the tangible benefits of the ICAS project. Regular meetings and updates helped to reinforce trust and commitment among the farming communities.

By addressing these challenges through proactive measures, the project team ensured the continuity and effectiveness of the project, turning potential obstacles into opportunities for improvement.

9. Lesson Learnt

Project Management

The project faced initial delays due to the lengthy approval process for the inception report and procurement plan. These bottlenecks affected subsequent activities, highlighting the need for streamlined and expedited approval channels to ensure timely project execution. Delays in procuring essential weather gadgets and mobile phones highlighted the importance of anticipatory planning and securing approvals ahead of time for critical procurement processes.

Project Execution

Scheduling conflicts with Ramadan affected training sessions. Future planning must consider cultural and religious calendars to avoid such overlaps, ensuring convenience for all participants. The introduction of pre-training feedback forms, while valuable, extended session durations and led to participant withdrawal. Simplifying the feedback process is essential to maintain engagement.

Development Team

Proactive engagement with stakeholders through comprehensive interviews and interactive workshops proved crucial for capturing diverse perspectives and building a strong foundation for requirement gathering and consensus building. Transitioning to an agile development methodology with iterative cycles and continuous feedback mechanisms improved adaptability to evolving project needs, enabling effective prioritization based on user insights. Emphasizing continuous learning and iterative improvement through systematic reflection on processes and outcomes enhanced our approach to future projects. Additionally, collaborative finalization of UI changes with the project team pre-emptively mitigated unforeseen alterations, keeping development timelines on track.

Leveraging Flutter for its cross-platform capabilities significantly reduced development and maintenance efforts, ensuring a unified user experience across platforms. Implementing scalable system architecture with distributed computing principles effectively supported expanding user demands and data management needs. Mastery in Flutter allowed for rapid development cycles, strategic management of app state, and resource utilization, while sophisticated location-aware functionalities enriched the user experience. Thorough proofreading of Urdu translations ensured cultural and linguistic integrity, and intuitive UI design for satellite-based information added significant value to the application. Prioritizing data security with advanced protocols protected sensitive information throughout the development lifecycle, and extensive testing and quality assurance processes enhanced code quality and reliability. Open communication and teamwork facilitated efficient project delivery, and continuous post-deployment support ensured enduring success and ongoing improvement based on user feedback.

Annex 1: Records of Events

- Training of citizen scientists and gadget distribution in Peshawar region, 28th February 2024.
- Training of citizen scientists and gadget distribution in District Sargodha, 4th March 2024.
- Training of citizen scientists and gadget distribution in District Sheikhpura 5th March 2024.
- Training of citizen scientists and gadget distribution in District Sahiwal on 6th March 2024.
- Training of citizen scientists and gadget distribution in District Sahiwal on 7th March 2024.
- Training of citizen scientists (females only) and gadget distribution in District Tandojam and Sanghar on 9th March 2024.
- Training of citizen scientists (males only) and gadget distribution in District Tandojam on 10th March 2024.
- Training of citizen scientists (males only) and gadget distribution in District Mirpurkhas on 10th March 2024.
- Training of citizen scientists (males only) and gadget distribution in District Sanghar on 11th March 2024.
- Training of citizen scientists (females only) and gadget distribution in District Bahawalpur on 17th March 2024
- Training of citizen scientists (male only) and gadget distribution in District Bahawalpur on 18th March 2024
- Collaborations/stakeholder engagement meeting (virtual) on 17th May 2024
- Collaborations/stakeholder engagement meetings (in person) on 12th June 2024
- Farmer/citizen engagement meetings in all target districts during 19th May to 10th June 2024 (9 meetings held)

Annex 2: Event reports/minutes, Learning documents, Knowledge products, Communication products or other documents

Knowledge products are due during the next half year of the project, following is the list of knowledge products;

- Report on the upscaling plan for the governance of the solution withing the country and across the region (4th Quarter 2024)
- Publication on the case studies/stories of change by the citizen scientists (4th Quarter of 2024)
- Training manual to become a climate champion in person of a citizen scientist (3rd quarter of 2024)
- Short videos on the webpage for guiding citizen scientists for using the web resources (4th Quarter of 2024)
- Report on narrative journey on “irrigation and climate advisory services” (4th Quarter of 2024)

Communication material generated so far;

- Training modules and gadgets developed for the farmers and handed over to them.
- Concept note/project brief prepared and shared with stakeholders during the collaboration meetings
- Farmer-research link you tube channel is created to share and publish the videos related to the innovation

Workshop meetings/reports highlights

Two collaboration and stakeholder meetings were held with the objective to engage the stakeholder organizations regarding the innovation and jointly work towards its upscaling. Following were the highlights of the first virtual meeting held on 17th May 2024;

Introduction to the Innovation: Detailed presentations on Irrigation and Climate Advisory Services (ICAS) were delivered, outlining the project's goals, methodology, and the role of citizen scientists.

Objectives of the Stakeholder Consultation: The objectives were briefed to stakeholders, emphasizing their participation in consultative meetings and local scale coordination.

Discussion on Sustainability: A detailed deliberation on the sustainability of ICAS, highlighting the need for a robust governance and financial model.

All the key focal persons joined during the first virtual meeting held on 17th May 2024 and welcomed the initiative. All of the potential stakeholders ensured necessary support required for the initiatives. Glimpses of the post consultation collaborative activities are following;

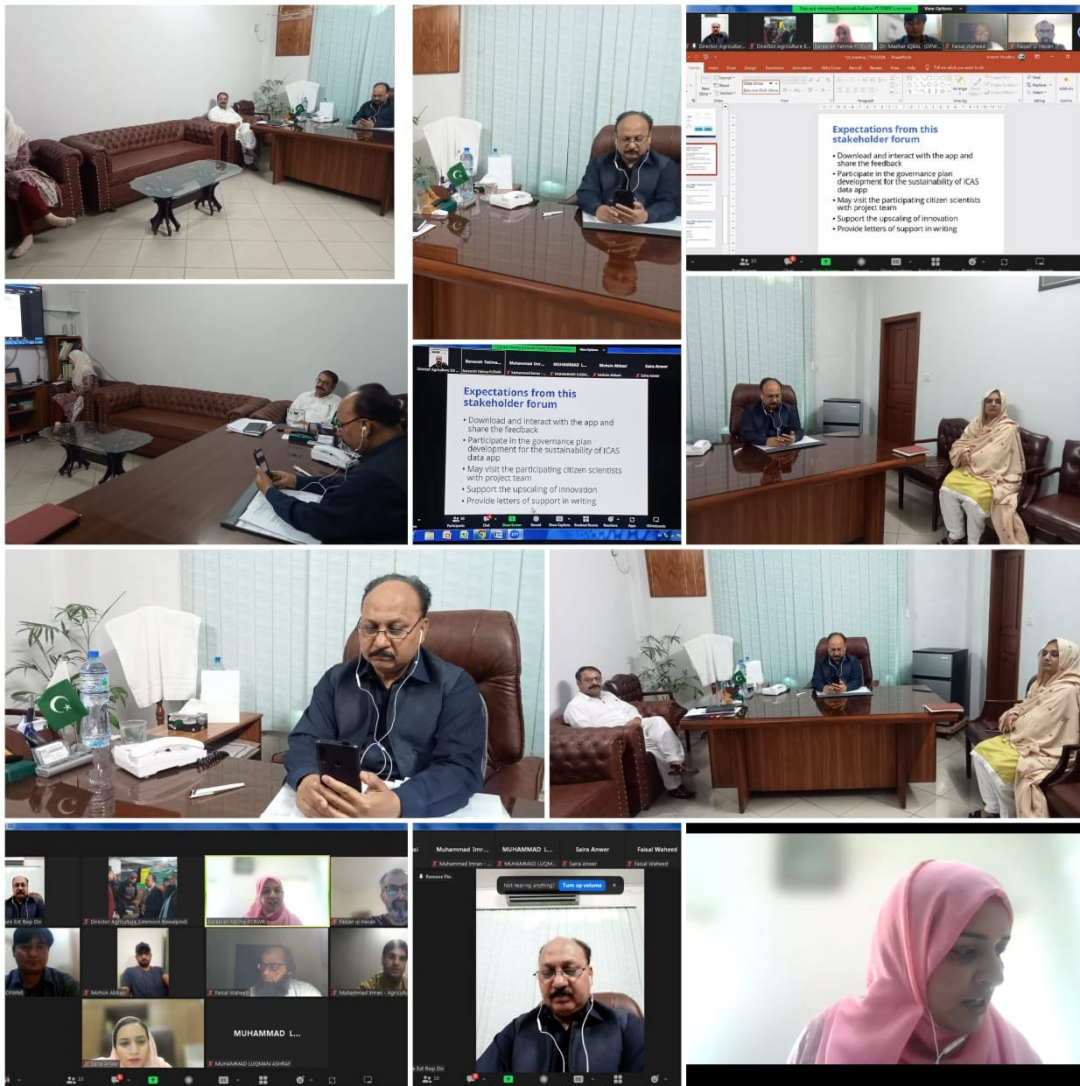


Figure 1. Feedback shared by Punjab Agriculture Extension Department

[As reported by Punjab Agriculture Extension Department] Today on 17th May, 2024 as Focal Person of the Govt of the Punjab Agriculture Deptt, attended consultative session regarding upscaling of customized irrigation and climate advisory services through citizen Science via Zoom Link meeting organized by PCRWR, Islamabad. Representative of Extension & Water Management wings from all provinces and private sector stakeholders participated in the meeting.

Ms. Bareerah, Director PCRWR briefed the participants that PCRWR launched the ICAS data app regarding the weather conditions and climatic changes data which is available on play store.

She requested all the participants to download the app and give their feedback for the improvements in app. She also requested Agri Ext Department for dissemination of app information among farming community.

While addressing all stakeholders she requested the support from Government department for the sustainability of ICAS data app for the betterment of Farming community.

Myself suggested that app must be simple, easy to understand and operate for its effective utilization. I also suggested that all departments should work in collaboration, to formulate and strengthen the climate resilient policy under contemporary climatic conditions.

Joint field activity with government stakeholders in Sindh

As per written request to the government institutions, the focal persons were also requested to engage with the field teams during the activities to provide a feedback and offer suggestions for the improvement in the implementation process. In this regard, focal person from the Department of Agricultural Research, Tandojam accompanied the project team during the post training feedback survey collection and initial consultation with farmers on the upscaling of the solution. This joint visit was made in all three sites of Sindh, i.e. Mirpurkhas, Sanghar and Tandojam.



Figure 2. Field team and stakeholder's joint survey to Mirpurkhas Citizen Scientists on 19th May 2024.

As a follow-up to the field visit, the Department of Agricultural Research, Sindh shared its feedback through a letter of endorsement to the on-going field activities.



**DIRECTORATE
PLANT DISEASE RESEARCH INSTITUTE
TANDO JAM**



Email: plantpathologyvari@gmail.com
No.PDRI/ADMN/ 60 /2024

Contact: 022-3405128

Mob: 0301-3515299
Dated: 23-05-24

To,

Engr. Bareerah Fatima
Director, PCRWR
Islamabad

Subject: **LETTER OF ENDORSEMENT: ACCESS OF ICAS DATA SOLUTION TO PARTICIPATING FARMERS**

Dear Madam,

I am writing about your official request for the nomination of a focal person from my organization. As the nominated individual, I attended the first stakeholder consultation held virtually on 17th May 2024. Additionally, at your request during this consultative forum, I accompanied your field team to visit the project sites located in Sindh province.

Firstly, I would like to congratulate you on providing the innovative ICAS solution to the small and medium landholders in the districts of Sindh that are central to agricultural activities in the province, specifically Tandojam, Mirpurkhas, and Sanghar.

It is important to note that farmers in this social setting in Sindh face numerous challenges to their agricultural livelihood, with climate change being the most severe. Most of the participating farmers and citizen scientists cultivate vegetable crops alongside major crops such as Cotton, Sugarcane, Wheat, and Maize. The training provided under this project on the weather gadgets and advisory solution is significantly helping them in two key ways:

- i. Planning the cultivation of vegetable crops based on climate forecasts offered by the ICAS data app.
- ii. Directly interacting with the weather gadget and learning about their climate, such as the actual depth of rainfall, to better plan their agricultural decisions.

We believe that such scientific knowledge and training for farmers is instrumental in developing their resilience to climate change. I am directed to convey the full support of my office for additional services, such as soil testing, water testing to the participating farmers and to popularize this solution among other farmers.

Looking forward to further collaboration on the ICAS solution.

MOHSIN ZULQARNAIN HUSSAIN ABBASI
Scientific Officer
Plant Disease Research Institute
Tandojam

Figure 3. Feedback/letter of endorsement from Department of Agriculture Research, Sindh

As a part of collaboration activities, second stakeholder consultation was arranged on 12th June. In addition to the focal persons from the key organizations, some participating farmers/citizen scientists also joined to shared their feedback regarding the on-going activities under the projects.



Figure 4. Group photo of the second stakeholder meeting participants

Feedback from the Participants

During the meeting, extensive feedback was gathered from stakeholders, which highlighted several key points:

Innovation and Utility: The citizen science component is seen as a highly innovative approach that could significantly improve the accuracy of climate data collected remotely. This enhancement can lead to better-informed irrigation practices.

Integration with Existing Services: Provincial governments provide crop calendars and promote high-efficiency irrigation systems. ICAS can play a critical role in developing more accurate and effective crop calendars, benefiting farmers.

Feedback Mechanisms: The importance of establishing a feedback mechanism was emphasized to ensure farmers have confidence in the technology. This can lead to higher adoption rates and more effective use of advisory services. This system should include:

1. Real-time feedback mechanisms.
2. Instant response capabilities for farmer inquiries.
3. A dedicated support team to assist farmers with technical issues and provide tailored advice.

Data Specificity: While the PMD provides climate data, it is not sufficiently specific. ICAS, with its citizen science approach, can provide more granular and actionable data.

Adaptation to Climate Change: Climate change is causing shifts in crop schedules, making timely and accurate advisory services more crucial than ever. ICAS can help farmers adapt to these changes effectively.

Collaboration and API Integration: Collaboration with the Inara development team is crucial to ensure API compatibility and enhance system integration. Likewise, connecting APIs of the PMD with the ICAS app may be looked upon to share weather data and other relevant information.

Real-time Data Sharing and Feedback: The participants suggested to incorporate features allowing farmers to view data from peers and provide real-time feedback. The possibility may be explored to enable farmers to upload crop condition pictures as part of the feedback process.

Soil and Crop Mapping Tools: A soil and crop mapping tool should be developed to allow farmers to input soil details and receive crop suitability recommendations. This tool should be integrated into the ICAS app and consider the following:

1. Electric conductivity.
2. Soil pH.
3. Crop segmentation based on climate data and sowing/irrigation schedules.

Education and Capacity Building: Workshops and media campaigns should be planned to educate farmers on modern farming techniques and climate adaptability. Key points include:

1. Training model farmers who will then train other community farmers.
2. Building the capacity of citizen scientists in water management practices.
3. Utilizing social media platforms for outreach and education.

Water Management and Climate Data: Participants highlighted the importance of incorporating detailed water management and climate data into planning tools. Specific suggestions include:

1. Timing and patterns of rainfall, including the amount, start, and end times.
2. Differentiating between weather (short-term) and climate (long-term).
3. Addressing changes in rainfall patterns and their impact on crops.
4. Evaluating heat flux models for crop management.
5. Implementing two-source energy balance channels to determine crop water requirements.
6. Discussing alternative irrigation methods and the potential ban on groundwater pumping.

Crop Advisory Enhancements: Enhancing the crop advisory section of the ICAS app was a major focus. Participants suggested:

1. Including detailed crop data as per Agricultural Extension Department recommendations.
2. Displaying sowing and harvesting times, crop distribution, and market rates.
3. Categorizing crop advisory into Rabi and Kharif crops.
4. Linking sowing/harvesting times and crop rotation to specific regions.
5. Providing information on the number of irrigations per crop for better scheduling.

6. Incorporating a climate-shifting mechanism to address changing climate conditions.

Discussion on the Governance Plan

KP Extension Department:

Current Efforts: Sends crop advisories to 0.7 million farmers using text messages, call centers, and robocalls.

Challenges: Sustainability is a major issue due to the increasing financial cost of text messages and robocalls. Negotiations are ongoing with mobile service providers to utilize WhatsApp for messaging, which may reduce costs.

Sindh Extension Department:

Current Efforts: Provides daily climate advisories via SMS, but not on a regular basis.

Challenges: Faces significant sustainability issues that hinder consistent service delivery.

Punjab Extension Department:

Current Efforts: Existing advisory services are not functioning effectively due to financial constraints.

Recommendations from Stakeholders:

Collaborative Efforts: All stakeholders should collaborate to educate policymakers on the realities and challenges faced by farmers.

Utilization of ICT: Emphasized the potential of ICT technologies in enhancing advisory services.

Financial Model: There is a consensus on the need to develop a financial model to ensure the sustainability of ICAS.

Insurance Linkages: Exploring linkages with private insurance companies to integrate ICAS into their existing services was suggested.

Next Steps and Recommendations

Finalize the Governance Plan: Ensuring a comprehensive governance framework that supports the long-term sustainability and impact of ICAS.

Promote the ICAS App: Wide promotion across Pakistan, encouraging farmers and stakeholders to download and interact with the app.

Training and Capacity Building: Conduct training sessions for farmers to effectively use the ICAS app. This includes developing short videos and interactive guides to aid in understanding and usage.

Feedback and Continuous Improvement: Establish a robust feedback mechanism to continuously gather insights from stakeholders and participating farmers, allowing for ongoing refinement and improvement of services.

Stakeholder Engagement: Encourage stakeholders to participate in the governance plan development and to support the upscaling of the innovation by providing letters of support and participating in field visits to citizen scientists.

Annex 3: Results Framework

PDO Indicator Description: Government agencies and Citizens who have access to climate-resilient solutions tested under the project (Number)		
	Current Value	End Target
Government Agencies	5	5
Male Citizen	111	117
Female Citizen	33	33
Date	30 th June 2024	30 th October 2024
Comments	So far 144 number of citizens are included who are engaged with the project.	It is anticipated that with interaction of other stakeholders this target is likely to be achieved.
Outcome 1 Indicator Description: Dissemination of Irrigation and climate advisory service to more crop zones (districts)		
Value	11	11
Date	30 th June 2024	30 th October 2024
Comments	So far, the ICAS is being provided to 11 target districts	There is an anticipation that the number of target districts will increase.
Output 1.1 Indicator Description: Number of platforms where promotion material is developed and disseminated.		
Value	2	5
Date	30 th June 2024	31 st December 2024
Comments	Citizen scientists and the collaborating agencies have the material relate to the innovation.	Most of the promotional activities are planned during the next half of the project.
OUTPUT 1.2 Impact assessment of upgraded ICAS use by the farmers in the target districts.		

Value	144	150
Date	30 th June 2024	30 th October 2024
Comments	Number of participating citizen scientists	Number anticipated to be increased by the inclusion of mirror sites.
Output 1.3 Number of people participating in supported events (by participant category, sex, year, theme, country)		
Value	171	200
Date	30 th June 2024	30 th December 2024
Comments	132 males and 39 female participations in citizen scientist trainings, collaborative meetings	
OUTCOME 2 Popularizing the concept of "citizen science" for climate change adaptation Indicator description: Number of events supported by type, year, theme and country.		
Value	13	18
Date	30 th June 2024	30 th November 2024
Comments		
Output 2.1: Number of citizens using citizen science data collection app		
Value	218	200
Date	30 th June 2024	30 th December 2024
Comments		
Output 2.2: Number of people trained (in person) (by sex, country, topic, year, participant category)		
Value	144	150

Date	30 th June 2024	30 th October 2024
Comments	111 male farmers and 33 female farmers, in person training activities to become the citizen scientists.	
Output 2.3: Number of (in-person) and virtual meetings held with the representatives of government agencies.		
Value	2	6
Date	30 th June 2024	30 th December 2024
Comments		
Output 2.4a: Number of knowledge products developed		
Value	1	5
Date	30 th June 2024	30 th December 2024
Comments	Training manuals have been developed and available on the solution website.	
Output 2.4b: Number of people/organizations provided with knowledge products (by recipient category, type of knowledge product, country, theme)		
Value	144	200
Date	30 th June 2024	30 th December 2024
Comments	Training material provided to all the citizen scientists. Additionally, the material related to ICAS solution is also provided to the representatives of 5 government agencies, 2 universities and 1 private agency.	



Asian Disaster Preparedness Center

SM Tower, 24th Floor, 979/66-70 Paholyothin Road,
Phayathai, Bangkok 10400 Thailand

Tel: +66 2 298 0681-92

Fax: +66 2 298 0012

Email: adpc@adpc.net



www.adpc.net



Asian Disaster Preparedness Center - ADPC



@ADPCnet



Asian Disaster Preparedness Center (ADPC)