

iCARE Innovation Fund

High Throughput Crop Monitoring using Computer Vision for Climate Smart Agriculture

Monthly Progress Report

Reporting Period (06, 2024)

Prepared by:

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1. Project Information

Project Title:	High Throughput Crop Monitoring using Computer Vision for Climate Smart Agriculture
Project Code:	WBCAR
Partner Organisation:	Centre for Advanced Studies - Agriculture and Food Security, University of Agriculture Faisalabad, Pakistan Guangzhou Institute of Software Application Technology, P.R. China
Reporting Period:	June 01, 2024 to June 30, 2024
Date of Submission:	Jun 04, 2024
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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 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: _____ Designation: _____

2. Key Achievements

- **Re-Tender of the remaining two items.**
- **Testing and Configuration of Water Quality Sensor.**
- **Integration of Sentinel-2 satellite data with portal.**
- **Basic Graphical User Interface (GUI, Front-end) design with features (Date Range Selection, Area of Interest Mapping, Displaying Satellite Images).**

3. Implementation Progress

Activity Title	Last Month Progress	Current Month Progress	Activities, and Events, planned for the subsequent month
Activity 1.1.1: Preparation of clear job description and advertisement (Dec-2023)	<ul style="list-style-type: none"> • Completed 	<ul style="list-style-type: none"> • Completed 	N/A
Activity 1.1.2: Interview, Selection, and orientation of candidates (Dec-2023)	<ul style="list-style-type: none"> • Completed 	<ul style="list-style-type: none"> • Completed 	N/A
Activity 1.2.1: Preparation of tenders and advertisement for bidding (Jan-Feb-2024)	<ul style="list-style-type: none"> • Completed 	<ul style="list-style-type: none"> • Completed 	N/A
1.2.2: Screening of bidding documents and preparation of supply orders (Feb-Mar-2024)	<ul style="list-style-type: none"> • Completed <ul style="list-style-type: none"> ○ Weather Stations ○ Water Quality Sensor • In-Progress <ul style="list-style-type: none"> ○ Soil Sensor ○ Computer with GPU 	<p>Re-tender of remaining two items (Soil Sensor and Computer)</p> <ul style="list-style-type: none"> • Completed <ul style="list-style-type: none"> ○ Bids Opening ○ Evaluation ○ Technical and Financial Comparative • In-Progress <ul style="list-style-type: none"> ○ Bids Acceptance Issuance ○ Supply Orders Issuance 	Bids Acceptance and Supply Orders for Soil Sensors and Computers will be issued.

<p>Activity 1.3.1: Install and configure the equipment at relevant locations</p> <p>(April-2024)</p>	<ul style="list-style-type: none"> ● Completed <ul style="list-style-type: none"> ○ 3 x Weather Stations successfully installed and configured at UAF main campus, Burewala and Okara sub-campuses. ● In-Progress <ul style="list-style-type: none"> ○ 1 x Weather Station (pending delivery) ○ Soil Sensor (Pending Procurement) 	<ul style="list-style-type: none"> ● Completed <ul style="list-style-type: none"> ○ Water Quality Sensor testing and configuration. ● In-Progress <ul style="list-style-type: none"> ○ 1 x Weather Station (pending delivery) ○ Soil Sensors (Pending Procurement) 	<p>Remaining Weather Station, if delivered will be installed.</p>
<p>Activity 1.3.2: Data acquisition</p> <p>(May - 2024)</p>	<ul style="list-style-type: none"> ● Completed <ul style="list-style-type: none"> ○ 3 x Weather Stations are successfully transmitting data. ● In-Progress <ul style="list-style-type: none"> ○ Data from one Weather Station to be installed at Toba sub-campus (pending delivery) 	<ul style="list-style-type: none"> ● In-Progress <ul style="list-style-type: none"> ○ Data from Weather Station to be installed at Toba sub-campus (pending delivery) 	<p>If remaining Weather Station is delivered, we plan to complete the installation and initiate data acquisition.</p>
<p>Activity 1.3.3: Data validation</p> <p>(June-2024)</p>	<ul style="list-style-type: none"> ● Completed <ul style="list-style-type: none"> ○ 3 x Weather Stations are successfully transmitting data and the data has been validated. ● In-Progress <ul style="list-style-type: none"> ○ Data validation from one Weather Station to be installed at Toba sub-campus (pending delivery) 	<ul style="list-style-type: none"> ● In-Progress <ul style="list-style-type: none"> ○ Data validation from one Weather Station to be installed at Toba sub-campus (pending delivery) 	<p>If 4th weather station is delivered, we'll complete installation and validate its data.</p>
<p>Activity 1.4.1: Design and development of online portal and mobile app</p> <p>(Feb-Aug-2024)</p>	<ul style="list-style-type: none"> ● Completed <ul style="list-style-type: none"> ○ Backend Design has been completed. Satellite data is successfully being fetched for required dates and Area of Interest. ● In-Progress <ul style="list-style-type: none"> ○ Basic User Interface is being designed to test the Web Portal. 	<ul style="list-style-type: none"> ● Completed <ul style="list-style-type: none"> ○ Basic User Interface (Front-End) has been developed. ○ Functionalities added: <ul style="list-style-type: none"> ▪ Date Range Selection ▪ Draw Area of Interest ▪ Display satellite image ● In-Progress <ul style="list-style-type: none"> ○ Functionalities: <ul style="list-style-type: none"> ▪ Vegetation Indices Layers ▪ GUI Optimization 	<p>Vegetation Indices will be added to GUI to display Crop Health Maps. GUI Optimization will be done as required.</p>

<p>Activity 1.4.2: Data integration (Jun-Sept-2024)</p>	<p>In-Progress</p>	<ul style="list-style-type: none"> ● Completed <ul style="list-style-type: none"> ○ Integration of Sentinel-2 satellite data with the web portal for real-time crop health and stress mapping. ● In-Progress <ul style="list-style-type: none"> ○ Developing and refining algorithms to enhance data accuracy and processing efficiency. 	<p>Algorithm optimization to enhance Web Portal's speed and efficiency.</p>
<p>Activity 1.4.3: Testing (Aug-Nov-2024)</p>	<p>In-Progress</p>	<ul style="list-style-type: none"> ● In-Progress <ul style="list-style-type: none"> ○ Collaborating with Agri. Extension department to organize an event with local farmers to test the pilot Web Portal. ○ Development of Pilot testing protocols for the portal. 	<p>Testing of the Web Portal will be done with Government Organizations and local farmers.</p>
<p>Activity 1.5.1: Development of training materials and resources (Aug-Nov-2024)</p>	<p>In-Progress</p>	<ul style="list-style-type: none"> ● In-Progress <ul style="list-style-type: none"> ○ Initiating collaboration with the Agricultural Extension Department and the Pakistan Agricultural Research Council to develop training materials for farmers. ○ Conducting initial meetings to outline training content and resource requirements. 	<p>Meetings with the government organizations will be organized to start work on development of helpful and easy to understand material for the local farmers.</p>
<p>Activity 1.5.2: Training of stakeholder on using the online portal and mobile app for crop monitoring (Nov- 2024-Jan-2025)</p>	<p>In-Progress</p>	<p>In-Progress</p>	<p>Once the app and portal are ready, progress will start on this activity</p>

<p>Activity 1.5.3: Organize awareness seminars, workshops and conferences</p> <p>(Nov- 2024-Jan-2025)</p>	<p>In-Progress</p>	<p>In-Progress</p>	<p>Once the app and portal are ready, progress will start on this activity</p>
<p>Activity 1.5.4: Policy for the potential of scaling up of technology for the South Asian region</p> <p>(Feb-2025)</p>	<p>In-Progress</p>	<p>In-Progress</p>	<p>Once the app and portal are ready, progress will start on this activity</p>

4. Results Framework Indicators Progress

PDO Indicator Description: Government agencies and Citizens who have access to climate-resilient solutions tested under the project (Number)				
	Baseline	Actual (Previous)	Actual (Current)	End Target
Value	Govt: 1 Citizens: 200 (M:100, F:100)	0	0	Govt: 2 Citizens: 1000 (M:500, F:500)
Date		31 May 2024	30 June 2024	15 Jan 2025
Comments				
Output Indicator Description: Number of people trained (in person) (by sex, country, topic, year, participant category)				
Value	Citizens: 200 (M:100, F:100)	0	0	Citizens: 400 (M:200, F:200)
Date		31 May 2024	30 June 2024	15 Jan 2025
Comments				
Output Indicator Description: Number of people trained (online) (by sex, country, topic, year, participant category)				
Value	Citizens: 200 (M:100, F:100)	0	0	Citizens: 600 (M:300, F:300)
Date		31 May 2024	30 June 2024	15 Jan 2025
Comments				
Output Indicator Description: Number of knowledge products provided (by type of product, theme, country)				
Value	3	0	0	6
Date		31 May 2024	30 June 2024	15 Jan 2025

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Comments				
Output Indicator Description: Number of people / organizations provided with knowledge products (by recipient category, type of knowledge product, country, theme)				
Value	Citizens: 200 (M:100, F:100)	0	0	Citizens: 1000 (M:500, F:500)
Date		31 May 2024	30 June 2024	15 Jan 2025
Comments				
Output Indicator Description: Number of events supported (by type, year, theme, country)				
Value	Online: 1 Field: 1	0	0	Online: 2 Field: 2
Date		31 May 2024	30 June 2024	15 Jan 2025
Comments				
Output Indicator Description: Number of people participating in supported events (by participant category, sex, year, theme, country)				
Value	Citizens: 200 (M:100, F:100)	0	0	Citizens: 500 (M:250, F:250)
Date		31 May 2024	30 June 2024	15 Jan 2025
Comments				

54. Challenges, Lessons Learned and Way Forward

During our procurement process, we initially faced higher than expected bidding prices, limiting our ability to procure all intended items. This experience highlighted the importance of understanding market price fluctuations and maintaining a flexible budget.

Update:

- The re-tendering process has been completed, and bidders have quoted prices.
- For the computers, we are procuring one with a GPU and one without, but with a motherboard that supports future GPU upgrades.
- For the Soil Scan 360, we requested separate quotes for the pH and Nitrate sensors. At this stage, we are only issuing acceptance to purchase the Nitrate sensor as the pH sensor is beyond our budget.

Moving forward, these decisions ensure alignment with our financial parameters and overall project goals.

Annexures:

- **Tender Notice for remaining items to be procured.**



UNIVERSITY OF AGRICULTURE, FAISALABAD (TENDER NOTICE No.80/2024)

The prospective bidders having Income Tax, General Sales Tax, Provincial Sales Tax (if applicable) registered with relevant authority/department are invited to submit sealed tenders on the basis of Single Stage (two envelop procedure) for Purchase of Equipment and Consumables under budget head "High Throughput Crop Monitoring using Computer Vision for Climate Smart Agriculture" (in accordance with the bidding document) at Institute of Horticultural Sciences, University of Agriculture, Faisalabad.

Date of Receiving and Opening	26.06.2024	Receiving Time	10:30 a.m.
		Opening Time	11:00 a.m.
		Bid Security	2% of the Estimated Price
		Tender Fee	Rs.1000/- (Free, if Download)

* **Link for free Download:** http://uaf.edu.pk/directorates/dpiv/dpiv_tenders.html

1. The prospective bidder may download the bidding document carrying all details free of cost at the *link mentioned above or may have bidding document from the **Directorate of Procurement & Inventory Control (DPIC), University of Agriculture, Faisalabad (UAF)** subject to production of deposit receipt of Rs. 1000/- in the University Income Account (No.11-9/NBP, UAF Branch). The bidders shall drop the bids in the Tender Box or sent through Courier as per schedule. The bids will be opened at **DPIC** as per date & time mentioned above.
2. The UAF will not be responsible for any cost or expense incurred by the bidder in connection with the preparation or delivery of bids. In case of official holiday on the day of submission, the next day will be treated as closing date.

Note: The bid must be dropped in the Tender Box available in Director Room and not to be handed over to any person of the Directorate if the bid is sent by in person or through post, the same instructions be passed on to the Courier.

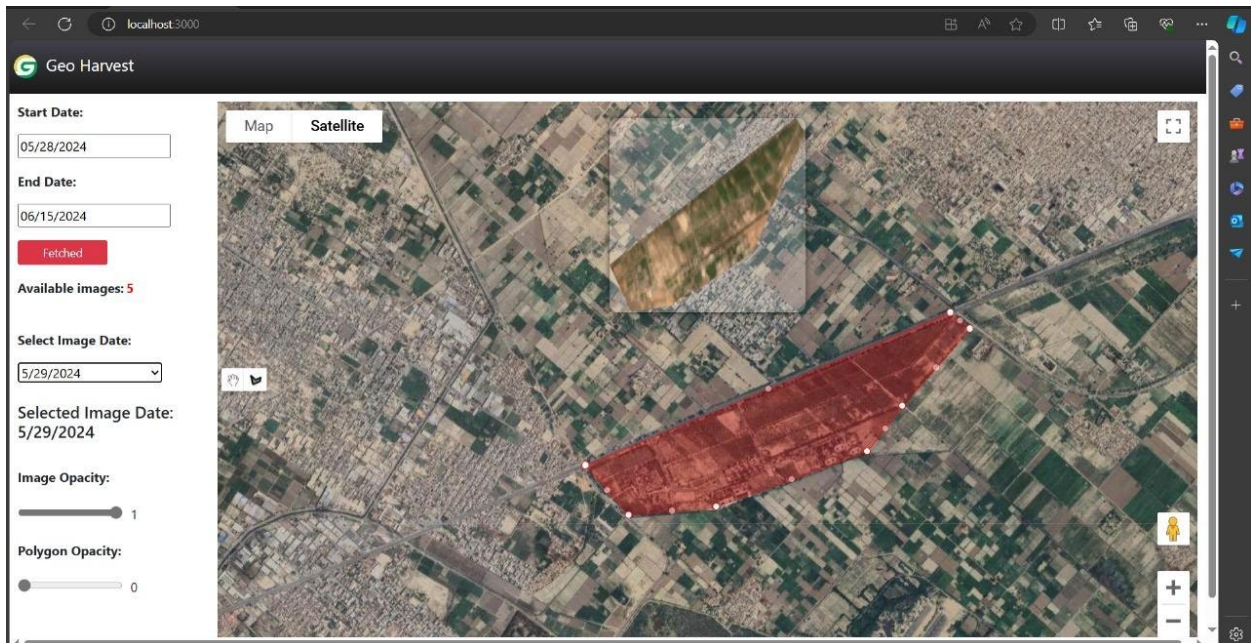
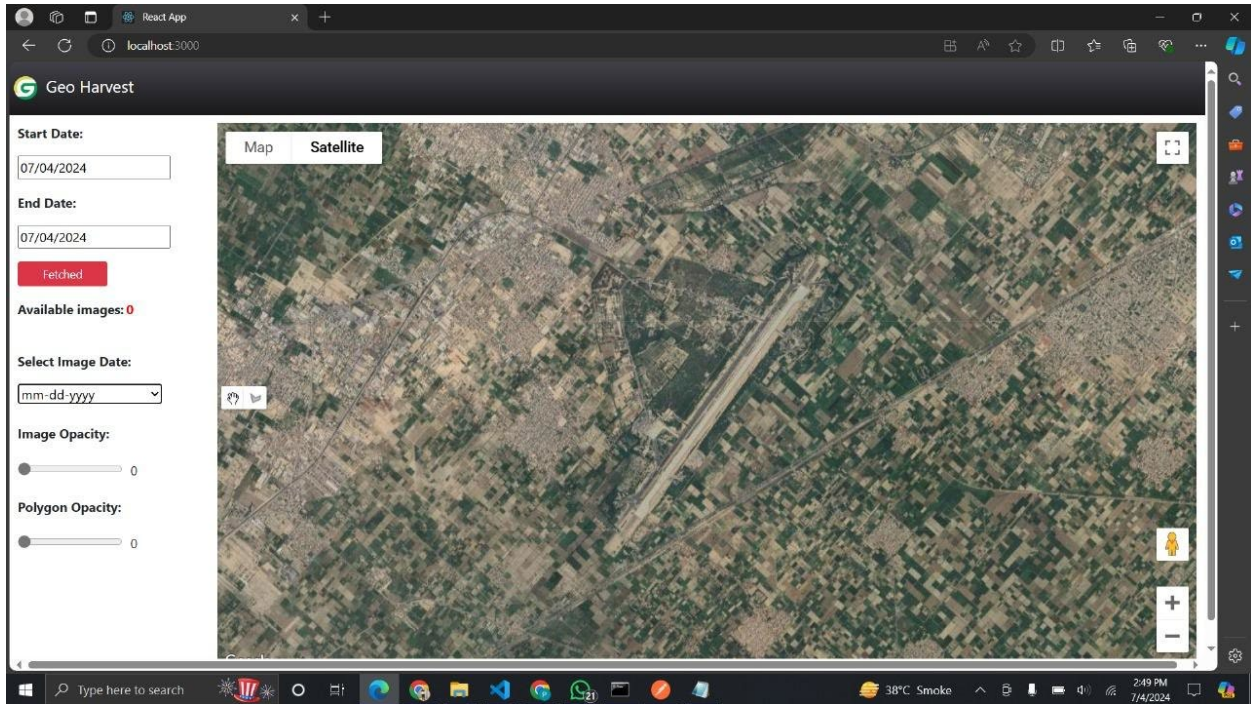
DIRECTOR (DPIC)
(For & On behalf of the Committee)
Phone#041-9200898,920016/ Extn.3503/3504/3505/3506/3507
E.Mail: dpic@uaf.edu.pk
store_officer@uaf.edu.pk

CC:

✓ Dr. Saqib Ali Assistant Professor/PI
CAS-AFS, UAF with the request to kindly make it
convenient to attend the tender opening meeting
as per schedule avoiding/postponing other engagements,
if any please.



- **Basic Graphical User Interface (GUI) for users to interact with portal. (Front-End Design)**



Glossary

Project Title	means	Exact and full name of the project as defined in the Sub Grant Agreement
Project Code	means	A five-digit code assigned by ADPC
Partner Organization	means	The lead agency(ies) responsible for the implementation of the project
Key Achievements	means	The actual outcome or impact of your work, such as reaching a PDO, or outcome or output defined in the final and agreed Results Framework.
Implementation Progress	means	Implementation progress means the steps or actions taken to achieve the PDO or outcomes or outputs. In this case it would be the list of activities defined in the final and approved work plan
Challenges	means	The most significant and persistent areas of risk that affect the project's ability to achieve its objectives. Challenges could be related to managing the Sub Grant, sustaining development gains, coordinating with stakeholders, and implementing core management functions. Please also discuss the solutions to mitigate these risks.
Lessons Learned	means	Lessons learned are contextual or operational information that may affect planning and future performance. They highlight the insights gained from the activity's implementation practices and progress, such as staff feedback, stakeholder interviews, data analysis, and success stories. They also include any changes required by or support requested from ADPC or partners.



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