

## **TERMS OF REFERENCE (TOR)**

### **MULTI-HAZARD IMPACT-BASED MONITORING AND EARLY WARNING SYSTEM**

#### **I. RATIONALE**

The Republic Act No. 10121 known as the Philippine Disaster Risk Reduction and Management Act of 2010 defines Early Warning System (EWS) as the set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organizations threatened by a hazard to prepare and to act appropriately and in sufficient time to reduce the possibility of harm or loss.

A people-centered early warning system necessarily comprises four (4) key elements: (1) knowledge of the risks; (2) monitoring, analysis and forecasting of the hazards; (3) communication or dissemination of alerts and warnings; (4) and local capabilities to respond to the warnings received. The expression "end-to-end warning system" is also used to emphasize that warning systems need to span all steps from hazard detection to community response.

Given that Quezon City is highly susceptible to evolving disaster risks due to multiple hazards, it is therefore a must to continuously improve on this matter and invest on modern technologies that will promote knowledge building, awareness raising, and disaster preparedness not just for the CDRMO but to the citizens of Quezon City. A multi-hazard localized early warning system that provides readily available information to the public would indeed further capacitate disaster preparedness of the city.

## II. PROJECT DESCRIPTION

The project aims to extend the service for the existing multi-hazard impact-based monitoring and early warning system which was procured by Quezon City Disaster Risk Management Office (QCDRMO-22-IT-473)

Below are the components of the project that require extension of service to ensure system availability and achieve excellent service level to its stakeholders.

- **Six (6) months internet connectivity, device maintenance, and data plan** of fifty (50) smart weather cameras that take local weather information and image snapshots every 5-min.
- **Six (6) months data processing and display license** that displays fifty (50) smart weather cameras, local supporting data such as weather, severe weather, air quality and mosquito activity data and one million (1,000,000) SMS/Viber notification credits for early warning dissemination.
- **Six (6) months data processing and display license** of fifty (50) smart weather cameras, environmental data
- **Five (5) days training** of five (5) Emergency Operations Center (EOC) personnel for sensor maintenance, system admin, and end user training.

The system has become vital for making critical decisions related to disaster risk reduction and response. It is critical to extend the services to further mitigate the impacts of climate change to continue to protect the lives of our citizens and help businesses and communities adapt to our rapidly changing environment.

III. TECHNICAL SPECIFICATIONS

Lot	Description	Delivery Time
I Lot	<b>3.1 Internet Connectivity Devices</b> <ul style="list-style-type: none"><li>• Six (6) months maintenance and data plan (20GB/month) of fifty (50) Internet Connectivity Devices</li><li>• Redundancy of internet/data connection for all sensors, rain gauges, and equipment under iRISE-UP, ensuring transmission of data despite power loss or significant signal loss</li></ul>	30 Calendar Days
	<b>3.2 Data Processing and Display License</b> <ul style="list-style-type: none"><li>• Data processing and storage of all fifty (50) Smart Weather Cameras including additional supporting datasets will be in a cloud-based data management system that uses Amazon Web Services' (AWS) Security Information and Event Management</li></ul>	30 Calendar Days

	<ul style="list-style-type: none"> <li>• Integration of additional datasets such as Weather Observations, Weather Forecast, Typhoons (PAGASA, JTWC, JMA), PAGASA CAP Alerts, Earthquakes, and Air Quality, Lightning Strikes (at least 95% lightning detection efficiency of CG lightning), Dangerous Thunderstorms (up to 45min early detection of Dangerous Thunderstorms), historical weather data and indices such as mosquito activity analysis data</li> <li>• Data display web application for command center use</li> <li>• Data display website for community/public use</li> <li>• Data processing and module for automated dissemination of early warning via for SMS, Viber (1,000,000 notification credits)</li> <li>• Integration ready to native mobile app and smart glasses</li> </ul>	
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	<ul style="list-style-type: none"> <li>• Automated weather animations with English and Filipino subtitles two (2) times daily containing processed data for local weather observations, weather forecast, PAGASA Radar, PAGASA GFA &amp; TC Advisories, Mosquito Activity and Air Quality</li> <li>• All related data should be already available/existing and integrated to the Data Display system and available for Testing or POC immediately</li> <li>• Upgrades and maintenance of all fifty (50) Smart Weather Cameras, Rain Gauges, Flood Sensors, Earthquake Sensors, Hydrometeorological Sensors and other Early Warning Systems integrated in the data display web application</li> <li>• Supporting weather &amp; natural disaster data licenses for one (1) year</li> <li>• Knowledge transfer on processing of data</li> </ul>	
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	<p><b>3.3 Training</b></p> <ul style="list-style-type: none"><li>• 1 Day Sensor Maintenance Training</li><li>• 1 Days System Admin Training</li><li>• 3 Days End User</li><li>• All trainings will have eight (8) hours per day with five (5) attendees</li><li>• Review and updating of Manual of Operations/Documentation</li></ul>	5 calendar days
	<p><b>3.4 Data Backup/Redundancy</b></p> <ul style="list-style-type: none"><li>• Backup all datasets in Komindad's cloud-based database to QCRRMO cloud-based database. Data dumps are to be performed every 15 minutes. All details pertaining to access to the QCRRMO database such as address or URL to a management console, userid and password are to again be given to QCRRMO.</li><li>• Perform redundant data writes to an ITDD database. When the ITDD database is set-up, there will be a</li></ul>	

	<p>one-time data dump so that it contains historical data. Then the redundant data writes can then be done after the data dump. The whole idea for the redundant writes to an ITDD database is to ensure that QCDDRRMO/ITDD has access to near real-time data similar to Komunidad's cloud based database. ITDD will provide Komunidad with IP address to the database server and dbuserid and password so that they can perform redundant writes to the ITDD database.</p>	
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#### IV. PROJECT STANDARDS AND REQUIREMENTS

Bidders should have completed, a single contract that is similar to this Project or related to Supply, Installation and Maintenance of Internet-connected devices, equivalent to at least fifty percent (50%) of the ABC five (5) years from the date of submission and receipt of bids, a contract similar to the Project.

Bidders should have at least five (5) field staff for the maintenance of smart weather cameras & internet, one (1) Meteorologist and one (1) Data Scientist for continuous consultation related to the service level and quality of environmental data that are used in the system.

Bidders should have demonstrated experience and capacity to manage internet-based devices in a highly urbanized city (HUC) in Metro Manila:

- Backup data connection and power;
- 24/7 technical support, with problem resolutions accomplished within 4 hours;
- Preventive maintenance and replacement of defective parts;
- Importation and access to raw data;
- Provision of manual workarounds to process said data in case of power or data loss; AND
- Generate reports such as, but not limited to Daily Weather Reports, Pre-Disaster Risk Assessments, sensor alerts, updates, and advisories, etc.

#### V. APPROVED BUDGET FOR THE CONTRACT

The approved budget for the contract is five million and five hundred fifty thousand pesos (P5,550,000).

ITEM	BUDGET (PHP)
<b>1. Maintenance and Data Plan of Internet Connectivity Devices</b>	<b>500,000</b>
• Maintenance of Internet Connectivity Devices	450,000
• Data Plan of Internet Connectivity Devices	50,000
<b>2. Data Processing and Display License</b>	<b>4,000,000</b>
• Data Processing and Display License	500,000
• Environmental Data License	4,500,000
<b>3. Training</b>	<b>50,000</b>
<b>TOTAL</b>	<b>5,550,000</b>

#### VI. PROJECT DURATION

The delivery period of the Project shall be within thirty (30) calendar days upon issuance of Notice to Proceed. License, warranty, and technical support are valid for six (6) months upon delivery of the Project.



## **VII. TERMS OF PAYMENT**

Below are the deliverables that will be used as the basis for full payment.

Item	Deliverables	Payment Percentage
<b>1. Maintenance and Data Plan of Internet Connectivity Devices</b>	Project Acceptance Document & License Certificate	15%
<b>2. Data Processing and Display License</b>	Project Acceptance Document & License Certificate	75%
<b>3. Training</b>	Training certificate and documentation	5%
<b>4. Manual of Operations/Documentation</b>	Manual of Operations or Project Documentation	5%

## **VIII. PENALTIES FOR BREACH OF CONTRACT**

Incomplete and delayed delivery will result in penalties based on standard Government implementing rules and regulations.

## **IX. CANCELLATION FOR OR TERMINATION OF CONTRACT**

Incomplete and delayed delivery and non-performance of services will result in penalties and termination of contract based on standard Government implementing rules and regulations.

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 04-07-2024  
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