

# Muhammad Agi Wardhana

*Technician of climatological equipment at Meteorology, Climatology  
and Geophysics Agency of Indonesia*

agi.wardhana@bmkg.go.id  
Linkedin : Muhammad Agi Wardhana  
(+62) 895-1479-5574

## Professional Profil

---

Technician with over three years of experience maintaining climatological instruments at Aceh Climatological Station, which operates under the Indonesian Agency for Meteorology, Climatology, and Geophysics (BMKG).

Deeply interested in full-stack web development, mobile application development, Python programming, and artificial intelligence. Currently exploring the use of real-time rainfall data for monitoring systems, and aspiring to become an expert in AI for time-series data prediction.

## Work experience

---

### Climatological Instruments Technician

*Apr 2022 -present*

**Institution:** The Meteorology, Climatology, and Geophysics Agency (BMKG)

**City:** Aceh Besar

**Country:** Indonesia

**Employment Type:** Full-time – Government Civil Servant

Specifically working at Aceh Climatological Station:

- Installed, maintained, and repaired climatological instruments including:  
Automatic Weather Stations (AWS),  
Automatic Rain Gauges (ARG),  
Agroclimate Automatic Weather Systems,  
Microclimate instruments,  
Particulate Matter 2.5 (PM2.5),  
High Volume Air Samplers (HVAS),  
Automatic Rain Water Sampler (ARWS), and  
Automatic Solar Radiation Systems (ASRS).
- Developed and maintained web-and mobile based system.

**Achievement:** Maintained 100% online status of all climatological instruments and achieved 99% data availability on the server throughout 2024.

### Geophysical Instruments Technician

*Oct 2021 -Des 2021*

**Institution:** The Meteorology, Climatology, and Geophysics Agency (BMKG)

**City:** Lampung Utara

**Country:** Indonesia

**Employment Type:** Internship

Specifically working at Lampung Utara Geophysical Station:

- Maintained geophysics instruments including Seismograph, Accelerograph, and lightning detector.

### Meteorological Instruments Technician

*Jan 2020 - Feb 2020*

**Institution:** The Meteorology, Climatology, and Geophysics Agency (BMKG)

**City:** Curug, Banten

**Country:** Indonesia

**Employment Type:** Internship

Specifically working at Budiarto Meteorological Station:

- Maintained meteorological instruments for aviation including Automatic Weather Station (AWS) and Automatic Weather Observing System (AWOS).

## Project Portofolio

---

### Official Website for Aceh Climatology Station - [Website]

Developed the office's main website to provide accessible public information on climate services, announcements, and activity updates, supporting better community outreach and transparency.

### Monitoring Manual Rain Gauge Condition Based Matrix Risk - [Website]

Built a centralized web platform to monitor and display the condition of rain gauge stations managed in collaboration with the River Basin Organization (BWS), improving site management to ensure accurate and reliable data.

### Aklima – Android Rainfall Monitoring App - [Mobile Application]

Created a mobile application that displays real-time rainfall data from AWS and ARG stations, supporting daily rainfall data for internal monitoring at the Aceh Climatology Station.

### Real-Time Data API Development - [API]

Designed and implemented a API that delivers real-time rainfall data to internal systems allows integration with other platforms.

### Automated Rainfall Data Processing for Dry Day Analysis - [Python Automation]

Developed a Python-based tool to automate the download and processing of daily rainfall data, enabling faster and more efficient analysis of Hari Tanpa Hujan (HTH) / Dry Day Analysis to support drought disaster monitoring and prediction.

## Education

---

### Bachelor of Applied Science in Instrumentation for Meteorology, Climatology, and Geophysics (B.A.Sc.) - (2017 - 2022)

*State College of Meteorology, Climatology, and Geophysics*

City: Tangerang Selatan

Country: Indonesia

Field(s) of Study:

- Meteorological, climatological, and geophysical equipment.
- Microcontrollers.
- Geophysics and weather sensor
- Electricity.
- Communication networks.
- IoT System.

GPA: 3.3 / 4.0 | Predicate: Very Satisfactory

Type of Credits: Semester Credit System – Number of credits: 156

## Publication

---

### Designing and Building an Air Humidity Data Processing and Crowdsourcing System Utilizing Artificial Neural Networks and Genetic Algorithms with Android Smartphone Integration - (2021)

*Undergraduate thesis published on the STMKG library website.*

This research explores how artificial intelligence—specifically artificial neural networks (ANN) and genetic algorithms—can enable Android smartphones to function as measurement tools for air humidity.

## Awards

---

### Diploma-IV Government Scholarship Award - (2017)

Awarded full scholarship by The Agency for Meteorology, Climatology, and Geophysics (BMKG)

As one of 250 diploma-IV scholarship recipients from BMKG for 4 years, selected from over 12,000 applicants.

## Mentoring and Supervision

---

**Supervised internship projects of undergraduate students from Syiah Kuala University**

**(1 July 2024 – 1 August 2024)**

**Location:** The Aceh Climatological Station

**City:** Aceh besar

**Affiliated University:** Department of Informatics, Syiah Kuala University

**Project Title:** *Design and Development of a Web-Based Leave Request System Using React JS and Express JS*

**Supervised internship projects of undergraduate students from Ar-Raniry State Islamic University**

**(5 August 2024 – 15 September 2024)**

**Location:** Aceh Climatology Station

**City:** Aceh Besar

**Affiliated University:** Faculty of Science and Technology, Ar-Raniry State Islamic University, Banda Aceh

**Project Title:** *Analysis of Pyranometer Instruments in the Automatic Solar Radiation Station (ASRS)*

## Certification and Training

---

**Learning Machine Learning for Beginners – Dicoding Academy**

**2021**

Introduced to core concepts of machine learning including supervised and unsupervised learning methods.

**Learn Basic Data Visualization using Python – Dicoding Academy**

**2021**

Studied basic plotting techniques and data presentation using libraries such as Matplotlib and Seaborn.

**Getting Started Programming With Python – Dicoding Academy**

**2021**

Learned fundamental programming concepts using Python, including syntax, functions, loops, and basic file handling.

**Calibration Uncertainty - Center for Agro-Based Industry, Ministry of Industry**

**2021**

Attended on understanding and calculating uncertainty in calibration processes, with a “Very Good” grade.

**Technical Workshop for Climatology Technicians and Observers – Deputy of Climatology, BMKG**

**2023**

Joined a national workshop on operational and technical aspects of climatological observations and instrumentation.

**Mobile Application Programming Technical Training – BMKG Communication Network Center**

**2023**

Completed intensive hands-on training in Android mobile app development, focusing on real-time data applications.

**OGD #208: Weather & Climate Model Verification – BMKG Training Center**

**2023**

Participated in a 90-minute online group discussion on evaluating the accuracy of numerical weather and climate models.

**OGD #213: Cybersecurity in Meteorological Systems – BMKG Training Center**

**2024**

Engaged in a 135-minute training session covering cybersecurity principles relevant to environmental data systems.

**Logger DataTaker for AAWS Equipment Training – BMKG Instrumentation, Calibration, and Engineering Center**

**2024**

Learned configuration, troubleshooting, and data extraction techniques for DataTaker loggers and Automatic Agroclimate Weather Stations.

**CS50's Introduction to Databases with SQL - Harvard University in edX - (In progress)**

Currently studying foundational machine learning concepts such as regression, classification, and model evaluation.

## Community Services

---

### Climate School for Farmers (Sekolah Lapang Iklim) – Sabang (2023)

Served as a facilitator introducing climate monitoring instruments to cacao farmers during a national outreach program focused on agricultural climate adaptation.

### Climate Literacy Outreach – (2024)

Delivered hands-on introductions to climatological instruments for various educational groups visiting the Aceh Climatology Station. Acted as field officer guiding climate instrument demonstrations during site visits, including:

- SMA Indrapuri (20 students, Jan 18 and 70 students, Feb 7, 2024)
- SMP Al-Athiyah (85 students, Feb 20, 2024)
- SMA Laboratorium Unsyiah (150 students, Feb 22, 2024)
- SMP Masaud Sigli (Feb 27, 2024)
- TK Arrabwah (93 children, Mar 3, 2024)
- SD Unggulan Sigli (Apr 30, 2024)
- Universitas Samudera (May 3 and Dec 13, 2024)
- SMA IT Nurul Fikri (Sep 11, 2024)
- Universitas Serambi Mekkah (Oct 30, 2024)

### Climate Literacy for Youth - (2024)

Delivered a climate instrument introduction session to university students from the Faculty of Mathematics and Natural Sciences, Syiah Kuala University, as part of a youth-focused climate awareness initiative.

## Technical Skills

---

### Telemetry & Remote Sensing Systems

- Weather sensor integration with Campbell Scientific and DataTaker data loggers.
- GSM modem configuration for data communication.
- Installation of power supply systems using solar panels.
- IoT data communication using MQTT, HTTP, and FTP protocols.

### Website and Mobile Development

- HTML, CSS, PHP, Bootstrap and Python for Web Development
- Mobile app development using Ionic React

### Task Automation

- Python scripting for automation.

### Database & Integration System

- Data services for API using python flaskAPI.
- MySQL database design, query handling, and data storage management.