

SMART WEATHER REPORTING SYSTEM USING IOT FOR FISHERMAN

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Abstract -

Fishermen often face hazardous conditions due to unpredictable weather patterns. Traditional forecasting methods are often inadequate, leaving them vulnerable to sudden environmental changes. This paper proposes a Fisherman Safety Device, a real-time environmental monitoring system designed to enhance their safety by providing timely alerts about changing weather conditions. The system utilizes sensors to collect data on key parameters like temperature, humidity, atmospheric pressure, and rainfall. This data is transmitted to the ThingSpeak platform for analysis and remote access. Critically, the system incorporates RF communication to deliver alerts directly to fishermen in the event of abnormal conditions, even in areas with limited communication infrastructure. This allows for proactive measures, such as returning to shore, significantly improving their safety and reducing the risk of accidents.

Keyword – Internet Of Things (IOT)

I.INTRODUCTION

This project, Fisherman Safety Device, aims to address this gap by developing a system that continuously monitors key environmental parameters—temperature, humidity, atmospheric pressure, and rainfall. By integrating these parameters into a real-time monitoring system, fishermen can receive timely alerts when hazardous conditions are detected. The device collects data from various sensors, processes it, and uploads the information to the cloud for

further analysis and visualization. Using platforms like ThingSpeak, the system not only stores the data but also allows for helping to track the environmental conditions over time.

One of the key features of this system is the RF communication module, which plays a pivotal role in ensuring the safety of fishermen at sea. In case of a dangerous situation—such as a rapidly approaching storm or a sudden drop in atmospheric pressure—the system sends an alert to the fishermen in real-time. The RF module transmits this alert, warning the fishermen to take

appropriate action, such as returning to shore or preparing for adverse weather conditions. This immediate communication can significantly reduce the risk of accidents and improve response times in critical situations.

The Fisherman Safety Device is designed to be cost-effective, easy to deploy, and capable of providing real-time updates to users who may not have access to advanced weather forecasting systems. By combining traditional environmental monitoring with modern wireless communication technologies, the system empowers fishermen with the knowledge they need to ensure their safety, ultimately improving their working conditions and reducing the dangers associated with unpredictable weather.

The following sections will delve into the specific components, design, and implementation of this system, highlighting its practical applications and potential to enhance the safety and well-being of fishermen at sea. This project envisions a future where technology bridges the gap between fishermen and accurate, timely weather information, helping them navigate more safely and confidently in their daily work.

Fishermen have long been an essential part of the global food supply chain, providing a significant portion of the world's seafood. However, they work in an environment where safety risks are omnipresent. Many fishermen, particularly those working in remote or offshore areas, face the

constant challenge of unpredictable weather conditions such as storms, heavy rainfall, or sudden changes in temperature and atmospheric pressure. The ability to predict and respond to these hazards in real-time is crucial for their safety. Unfortunately, the lack of reliable, real-time weather information makes it difficult for fishermen to take appropriate precautions in advance.

In this context, Fisherman Safety Device is proposed as a solution to mitigate the risks faced by fishermen at sea. The system is designed to monitor critical environmental parameters such as temperature, humidity, atmospheric pressure, and rainfall.

II. LITERATURE SURVEY

1. Title: Fishermen and Fishing Boat Monitoring System using MIMO Technology and Database Management

Authors: Reshmaja K Ramesh, S Ramesh,

Publication: 2023 5th International Conference on Smart Systems and Inventive Technology (ICSSIT)

Identifying the boundary tends to be a serious issue for the fishermen that leads them into various troubles. In India, around 40-60 boats are seized and 250 + fishermen are getting arrested every year for being requested for crossing the boundary. The main cause of the problem is the communication gap between the coastal guards

and fishermen. The proposed solution consists of four modules namely; the transceiver module, communication module, decision control module, and the database unit. The transceiver module is attached in fishing boats that consist of a QR code scanner, GPS module, RFID tag, and reader. Every fisherman is provided with a fisherman ID that has an RFID and unique QR code. The communication module consists of sea buoys with buoy repeaters, RFID tags, and readers. The fisherman ID and the transceiver module interact with the sea buoys present in the coastal region and, maintains the history of the arrival and departure of fishermen and the fishing boat and the same is recorded in the base station unit. Once the fishing boat crosses the warning limit, the alert message will be sent to the coastal guards through repeaters and the fuel valve of the boat will start to close. If the fishing boat crosses the fishermenu2019s limit, the rescue team gets into the rescue mission and the fuel valve of the boat will be closed. The proposed solution eases the work of the coastal guards by, providing automated database information. So that in case of rescue, it can be implemented immediately. This ensures the safety of the fishermen",

2.Title: Research on the Key Technology of Fishermen Safety Guarantee System

Authors: Jinglong Zhao,

Publication: 2023 7th International Conference on Transportation Information and Safety (ICTIS)

The safety of fishermen on fishing vessels is always at risk due to potential collisions with merchant vessels. The lack of timely information about incoming ships during fishing operations and sleeping can lead to disastrous consequences. This paper proposes a fishermen safety guarantee system that utilizes wearable devices to alert fishermen about the presence of incoming ships. The system involves three terminals: fishing vessel terminal, shore-based terminal, and fishermen terminal. The system utilizes sensor data from bracelets worn by fishermen and an algorithm to analyze the fishermen behavior and evaluate the fishermen defense ability, then combines the fishermen defense ability level and the collision risk level to evaluate fishermen comprehensive risk level. The system adopts the idea of modular design, constructs from the aspects of framework design, architecture, hardware design, software design and modeling methods. This system helps fishermen to be more aware of their surroundings, accurately assess the current encounter stage, and understand their corresponding duties, ultimately reducing the risk of collisions and ensuring the safety of fishermen.",

3.Title: GPS Assistive Communication Tool for Fishermen Community using Internet of Things

Authors: Josephine Selle Jeyanathan,K Naresh Kumar,P Viswanath Reddy,C Vishnu Chaithanya,M Naveen Kumar,P Manikandan,

Publication: 2023 8th International Conference on Communication and Electronics Systems (ICCES)

In this technological world, all the fields are getting developed with the emerging technologies efficiently. The fisher community is getting to lack in using technical devices due to cost effects. Here a major problem facing the fishers while fishing is considered. As many fishers once entered the sea or ocean, it is unable to connect with the outside world. To challenge this situation, proposed model is designed in such a way that whenever the fishers face any problem in the ocean, he can send a message to his family member whether he is safe or facing any danger. They can be able to track the location of fishers by means of latitude and longitude by using their mobile by which they have received. In this way the fishers can get help from respective family members. As it is known, fishing is the toughest and riskiest job. Sometimes fishers go fishing and become late to get home, at which time the family members get worried. For this two modes are considered (1) SAFE MODE, (2) DANGER MODE. In safe mode he can convey i.e., he is safe, and they can track his location. In danger mode he can convey he is in danger and his location gets tracked.",

III. EXISTING SYSTEM

Currently, fishermen rely on traditional methods for weather forecasting, which often include radio reports, visual observation, and experience-based knowledge. However, these methods are not always accurate or timely, especially for those

working in remote or offshore areas. Traditional weather forecasts may not account for sudden changes in environmental conditions, such as rapid pressure drops or unexpected rainfall, which can significantly affect fishing operations. Additionally, there is often a lack of reliable communication infrastructure in these areas, making it difficult for fishermen to receive real-time alerts or updates. In some cases, fishermen may have access to weather apps or GPS devices, but these tools typically do not offer comprehensive, real-time monitoring of multiple environmental parameters. As a result, fishermen are often left unprepared for changing weather conditions, increasing the risk of accidents, equipment damage, or even life-threatening situations.

IV. PROPOSED SYSTEM

The proposed Fisherman Safety Device aims to address these shortcomings by providing a comprehensive, real-time environmental monitoring solution that uses sensors to track key weather parameters such as temperature, humidity, atmospheric pressure, and rainfall. This data is then transmitted to the ThingSpeak platform, where it can be analyzed and accessed remotely, ensuring continuous monitoring of conditions at sea. The system is designed to send alerts through RF communication technology if abnormal environmental conditions are detected, such as the onset of storms or significant atmospheric pressure changes. These alerts will be sent directly to fishermen, even if they are far from shore or in

areas with limited communication infrastructure. This will allow fishermen to take preventive measures, such as returning to shore or preparing for rough weather. By integrating real-time data collection, cloud-based storage, and wireless communication, the proposed system will significantly enhance the safety of fishermen, providing them with the tools needed to stay informed and react promptly to potential hazards.

V. METHODOLOGY

The **Fisherman Safety Device** operates through a multi-step methodology to ensure accurate real-time monitoring and alerting of fishermen about environmental conditions at sea. First, environmental parameters such as temperature, humidity, atmospheric pressure, and rainfall are continuously measured using sensors like the DHT11 for temperature and humidity, and a barometric pressure sensor for atmospheric pressure. The collected data is processed by a microcontroller, such as the NodeMCU, which also handles communication and data transmission. This data is then sent to the **ThingSpeak** cloud platform via Wi-Fi, where it is stored and can be accessed remotely for visualization and analysis. The system monitors the data for any abnormal readings, such as a rapid drop in pressure or an increase in rainfall, which may indicate the onset of dangerous weather conditions. If such conditions are detected, the system triggers an alert, which is transmitted via RF communication to fishermen in the vicinity. The RF module ensures that alerts are sent over

long distances, even in areas with limited infrastructure. This methodology allows for continuous monitoring, real-time data analysis, and immediate alerts, enhancing the overall safety and preparedness of fishermen working in remote or offshore locations.

VI. CONCLUSION

In conclusion, the Fisherman Safety Device is an innovative solution designed to enhance the safety and well-being of fishermen by providing real-time environmental monitoring and early warning alerts for dangerous weather conditions. By integrating sensors like the BME180, DHT11, and Rain Sensor, along with the NodeMCU for data processing and wireless communication, the system ensures continuous monitoring of critical weather parameters such as temperature, humidity, pressure, and rainfall.

VII. REFERENCES

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