Enhanced Fishing Experience and Water Purification using IoT

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Abstract- The majority of coastal communities regard fishing as a key pastime, but because of floods and other coastal disturbances, it is challenging for fishermen to be aware of risks before setting out to fish. The implementation of a fisherman guidance system using a PIC controller is proposed for this paper. The development of a smart fishing system is discussed in this paper. It includes a solar panel, DC to DC battery, DC to DC load, PIC controller, temperature sensor, wind speed sensor, relay and water heater, relay and water purifier, RF transmitter, RF receiver, and water heater for enhancing fishing experience by boundary alert and purifying water. Sunlight is converted into electricity by the solar panel, and the DC to DC converter transforms that electricity into the necessary voltage and current for the system. The system and the employed sensors are controlled by the PIC controller. Every fisherman will require a lot of water for drinking, but it is impossible to transport enough water for a minimum of two days of fishing. Water heaters and purifiers are employed to combat this. The system's goal is to make fishing enjoyable by bridging geographical barriers and economically purifying water. To make it possible for the boat to be remotely monitored IoT is utilized. This is designed in a way that allows anyone to use the application with ease.

Keywords: Fishermen, Boundary, Security, PIC controller, Solar panel, IoT, Water purifier and heater, Emergency.

I. INTRODUCTION

The Indian Ocean, Arabian Sea, and Bay of Bengal are all part of India's more than 7,500 km of coastline. The country's exclusive economic zone (EEZ) is 2.02 million square kilometers, including 0.86 million square kilometers on the west coast, 0.56 million square kilometers on the east coast, and 0.6 million square kilometers surrounding the Andaman and Nicobar islands. Nonetheless, Sri Lanka had more fishing resources than India had. This is the primary cause of Indian fishermen's encroachment on the International Maritime Boundary Line (IMBL). Yet, this presents a challenge for Sri Lankan fisherman because Indian trawlers wreck their nets. Indians were imprisoned and occasionally shot as a result of this. To overcome this challenge, our technology initially sounds an alarm to alert the fisherman to the impending border. Fishing is one of the oldest pastimes that humans have ever known, and it is a favourite activity of people all around the world. Along with being a means of getting food, it is a source of entertainment and relaxation. It could be an enjoyable hobby or a competitive activity. People from many backgrounds and regions of the world have long enjoyed fishing, which has been around for generations. Nowadays, thanks to technological improvements, fishing can be even more rewarding and pleasant. Differentiating the international border presents the biggest obstacle for fishermen. As a result, we have developed the technology behind the Above Suggested System. This solution contributes to a better fishing experience by offering a sanitary and secure atmosphere. By establishing safe fishing boundaries, it also contributes to making fishing more effective and pleasurable. The usage of these technologies also contributes to a decrease in water pollution, which is good for the fish as well as the environment. Lowered the requirement for fuel. To create and implement a low-cost system for the safety, security, and tracking of fishermen.PIC controller is used to control the overall system.Conserveenergy, the system incorporates a compact hardware design and power backup. Monitors the wind speed and temperature in order to ensure the safety of the fisherman. For remote monitoring, the system makes use of IOT. Overall, using this approach to improve fishing is advantageous for both the user and the environment. In addition to making fishing safe and pleasurable, it also helps to lessen the amount of pollution in the water. This technique can be utilized to safeguard and preserve our ecosystem while fostering a more sustainable fishing experience.

II. LITERATURE REVIEW

J. E.Marca et al [1] has outlined the principal difficulties encountered when building a widespread application. One recommendation for the finest operating system for developing context-aware applications is Android. The author had included an analysis report on the effectiveness of several mobile devices for location-aware computing towards the end.

AsimS, Daniel et al[2] have defined the structure of the Android operating system.The introduction of Android platform components like Activity, Services, Content Providers, and Broadcast Receivers has improved the understanding of application development.

B.Kamalakannan developed a cutting-edge strategy for defending fishermen who breach maritime boundaries. This technique detects and alerts fishermen so they won't enter dangerous waters using GSM and RFID technology.The Global System for Mobile Communications, or GSM, is a mobile phone industry standard that is extensively adopted throughout the world. It is a dependable method of communication that enables fisherman to get in touch with their loved ones and authorities in an emergency. The technology known as RFID (Radio Frequency Identification) makes use of radio waves to allow for the wireless transfer of data. Authorities can monitor and track fishermen who breach maritime borders by using this technology to identify and track individuals or goods.

The paper by Guoqiang Mao, BarısFidan and Brian D.O. Anderson focuses on the localisation problem in wireless sensor networks. Since it enables effective node use and data transmission, localization is a critical problem for many wireless sensor network applications. The study discusses the difficulties that localization currently faces and suggests various localization methods. The authors begin by outlining the difficulties with localization in wireless networks, including the dearth of global positioning data, the scarcity of reference nodes, and the communication's constrained range. The research then investigates alternative localization techniques, including range-based and range-free procedures, and contrasts their benefits and drawbacks. The use of relative angle information and signal strength to increase localization accuracy is also covered by the authors.

III. PROPOSED SYSTEM

3.1 Problem Statement

- To develop and roll out a low-cost system for fisherman security, tracking, and safety
- As the boat crosses the line, make an alert sound.
- To make clean drinking and hot water from seawater
- The device includes a modest hardware design and a power backup to improve energy efficiency.
- Measuring the temperature and wind speed to ensure the safety of the fishermen
- IoT is employed to provide remote boat monitoring.

3.2 Advantages of Proposed System

- This can be used with any small fishing boats that support rechargeable batteries.
- Even for those who are unskilled, ease of usage.
- There are no maintenance costs.
- Produces hot water and drinking water of high standard.

IV. SYSTEM ARCHITECTURE

The RF transmitter and receiver aid in interacting with other users and monitoring the environment, as shown in the block diagram of the system in Figure 1.
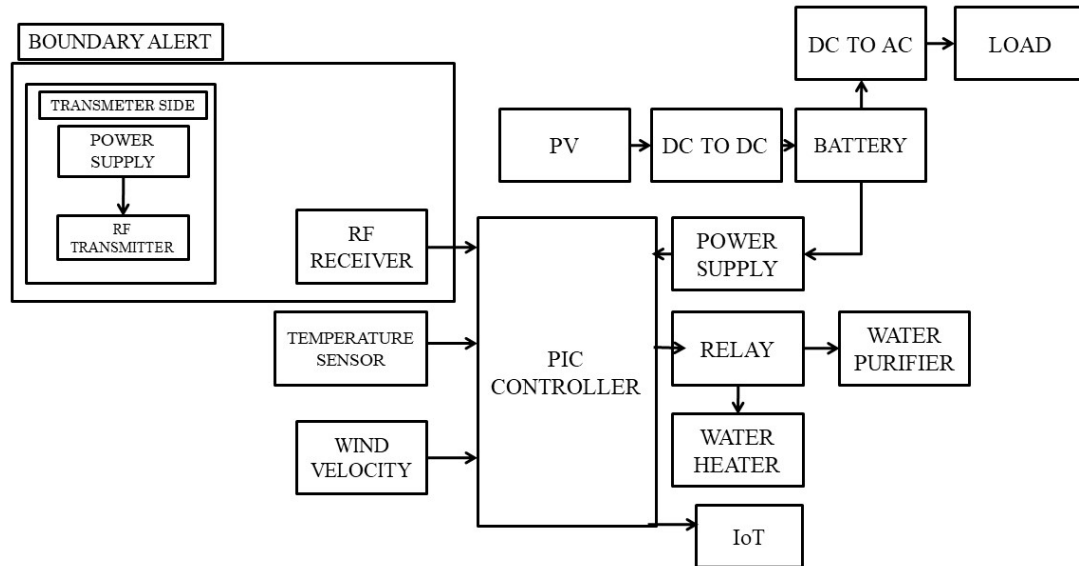
Figure 1.   Block diagram of the proposed system

4.1 PIC Controller

The system's functions are managed by the PIC controller. It is in charge of keeping track of the system's other parts, including the battery, solar panel, and other outputs. The relay, water heater, water purifier, the RF transmitter, and the RF receiver can all be controlled by the PIC controller.

4.2 Solar Panel

Solar panels are used to collect solar energy and transform it into useful electricity. Usually made up of photovoltaic cells, which collect solar energy and turn it into direct current (DC) electricity. A solar panel's output is influenced by the amount of sunshine it receives and its size.

4.3 DC to DC Converter

The DC voltage output from the solar panel is transformed into a regulated DC voltage that can power the other system components using aDC to DC converter. As a result, the system can still be powered by solar energy even when the sun is not shining because the DC to DC converter can still provide the required voltage.

4.4 DC to AC Converter

Direct current (DC) to alternating current (AC) conversion is done using DC to AC converters (AC).The DC electricity generated by the solar panel is converted into AC power using a DC to AC converter so that the system can be powered.

4.5 Battery

Battery serves as a backup power source in case of power interruptions and is used to store the energy generated by the solar panel.The energy obtained from the solar panel is kept in the battery. When the sun is not shining, this energy can be used to power the other system parts.

4.6 Relay

An electrically controlled switch is a relay. It is made up of a set of working contact terminals and a set of input terminals for one or more control signals. Any number of connections in different contact configurations, such as make contacts, break contacts, or combinations of both, may be included on the switch.

4.7 RF Transmitter and Receiver

The generator of the radiofrequency current that is sent to the transmitting coil is a radiofrequency (RF) transmitter. The radiofrequency signal can be sent and received by radiofrequency coils, or they can only act

as receivers.Radio frequency (RF) receivers are technological tools that distinguish radio waves from one another and transform particular waves into audio, video, or data formats. An antenna is used by RF receivers to pick up transmitted radio signals, and a tuner is used to distinguish one particular signal from all the others.

4.8 Temperature Sensor

In order to detect temperature changes and turn them into data, temperature sensors monitor the amount of heat energy in a source. Temperature requirements for devices and the surroundings are frequently specified for machinery used in production.

4.9 Wind Velocity Sensor

The wind velocity sensor is utilised to gauge wind speed. This can be used to choose the ideal location for the system to be installed and the ideal operating conditions for the system. To gauge the wind speed in the fishing area, a wind velocity sensor is employed.

4.10 Water Purifier and Heater

The process of purifying water involves taking out unwanted chemicals, biological pollutants, suspended solids, and gases. Water is typically cleaned and disinfected for human consumption (drinking water), but it can also be purified for a range of other uses, such as industrial, medicinal, and pharmaceutical ones. Hot water heaters are devices that heat water and maintain it at a higher temperature for a prolonged period of time. They serve the crucial goal of providing a consistent and ongoing supply of water.

V. CONCLUSION

Finding the boundary and reliable meteorological information used to be challenging for fishermen. With the help of this project, which also enables constant climatic monitoring, we can easily identify the border. The boundary alerts serve as an important tool for maintaining safety and security, and can be customized to meet the specific needs of different environments and situations. A temperature sensor can be used for a variety of purposes, such as monitoring water temperature, air temperature, or surface temperature of objects such as buoys or ships.As long as it is correctly constructed and engineered to endure the particular environmental conditions of the location, a solar water heater might be an excellent alternative for producing hot water in a marine area.

A solar water heater can save energy expenses and carbon emissions while also increasing property value and provide a consistent source of hot water for years to come. In a marine location, a solar water purifier can be a useful and long-lasting solution for supplying clean and safe drinking water. Fishermen are also able to determine how far away an island is. They might send an urgent and personal message to share their location as they are aware of how powerful the cyclone is. Using this project, they are able to survive cyclones. The Emergency LED lights and DC mobile chargers may both operate on the battery's stored electricity without the need for fuel. The Fisherman feel confident while travelling in the ship.

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