

# Border and Safety Alert System for Fishermen

S. Srinivasan, R. Nithya Priya, P.K. Suvetha and I. Thahasin

**Abstract**--- One of the frequent and unsolved problem of Tamil Nadu is that boundary between India-Srilanka is not easily identifiable by fishermen so the Tamil Nadu fishermen are arrested, or shot, by the Sri Lankan Navy and also the fishermen can't able to properly get the help at the emergency situation from Indian Navy. This project gives the solution using LoRa wireless technology. It transmits and receives signals for a long range and low power consumption device. By using this we transmit signals from shore and its act as a safe zone for fishermen. If the fishermen crossing the safe zone they get alert message through LCD and alarm through buzzer then that particular boat number is automatically passed to the Navy with the location of boat through GPS. In case of any emergency situation by pressing the emergency key, immediately message is send to the control station and also alerts nearby boats using zigbee. This system automatically monitors the weather condition using wind speed sensors.

**Keywords**--- LORA, LCD, Zigbee, Emergency Key, GPS (Global Positioning System), Wind Speed Sensor.

## I. INTRODUCTION

In our day-to-day life we hear the news about fishermen once out on the sea the fishermen are subjected to various oceanographic and climatic conditions. Tamilnadu has involved in conducting fishing along the India-Sri Lanka maritime border. Due to the lag of communication many fishermen are struggling a lot. On the basis of census 2018,

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there are 3,288 marine fishing villages in Tamil Nadu. The total Marine fisher folk population was about 4 million comprising in 864,550 families in Tamilnadu.85% of them having full time engagement in fishing activities. About 25,000 boats from since then the fishing activity is not being done peaceful. Tamil Nadu fishermen are arrested, or shot, by the Sri Lankan Navy and they are died due to storm and cyclone. They are not able to communication properly this leads to loss in the both humans as well as their economic incomes. To develop the effective tool to provide the safe navigation system for commercial vessels through waterways is vital thing global. Safety studies have found that the majority of. A portable device will be made which gives a proper communication between one boat to another boat as well as to Indian navy by implementing our project in real time we can save fishermen life.

## II. OBJECTIVE

The main objective of this project is to providing a possible solution to the various hardships faced by the fishermen. Guide the fisherman and navy guards with proper navigation. And also prevent them from climatic conditions like storm, cyclone and path misleading. Probably the communication problem and border crossing issue between India and Srilankan maritime boundary will comes to an end.

## III. EXISTING SYSTEM

In this system is for automatic Border crossing detection and navigation system. It acquires the actual position of the boat and transmits the signal by means of antennae. This in turn is connected to a PIC16F877A microcontroller using RS232. The microcontroller stores the current location and is sent through the ZigBee transmitter module for further processing. The position of the boat is received by the

Zigbee receiver module and is forwarded to PIC16F877A microcontroller. The microcontroller then sends the information to the GSM using MAX232 and further it is sent to the mobile through message if needed. The aware the fisherman that they are about to reach the nautical border. The area is divided into three zones fatal zone, warning zone, zone near to the fatal zone and finally the restricted zone. This system saves the life of the fishermen by making an alarm system and a motor controlled device, which is to be mounted in the boat/ship. If fishermen navigate near country's border, an alarm is generated indicating that the boat/ship is near the border of our country. The motor turns off if the boat touches the border.

**Disadvantages of Existing System**

1. Lack of awareness—There is no such system to warn the fishermen when they are about to cross the maritime boundary. Which lead to loss in the both human as well as their economical income.
2. No security system –lack of security alert from coast guard can also be the reason for this maritime boundary crossing issue. The coastal guards must save the fishermen when they are in danger

**IV. PROPOSED SYSTEM**

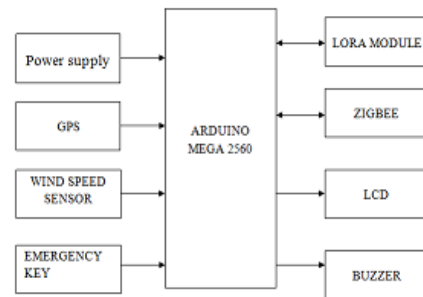
Lora wireless technology has transmitter and receiver. It transmits and receives signal for a long range. By using this we transmit the signal over 500km in the sea. Buzzer is used for intimate the fishermen when crossing safe zone. GPS (Global Positioning system) is used to find the location of the boat. The real time location of boat is always displayed in control room. Zigbee is used to transmit the signal around 5Km. It is used to alert the nearby boats during emergency situation by pressing emergency key.

Wind-speed sensor sense the speed of air and it is continuously displayed in LCD. This all are shown in block 1. The block diagram 2 is also the same working. The block diagram 3 is for the control station. Control station also contains Lora for the communication between shore and boat. The boat signals are received by the LORA receiver.

Through USB the signals are passed to the pc (personal computer). It shows current location of boat, which boat is crossed the safe zone and also display the boat number. All the boats are continuously display through Monitor.

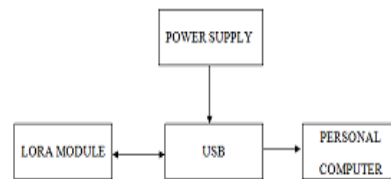
**V. SYSTEM ARCHITECTURE**

**1. Block Diagram of Proposed System**



Controller Section (Boat)

**Block Diagram of Control Room**



Control Room (Base Station)

**VI. HARDWARE MATERIAL**

Our proposed consists of nine major units which are discussed below as

**Lora Wasmote**



Lora Module

LoRa wireless technology is ideally suited to be used in a wide variety of applications. One of the major uses for the technology is to enable communications over long ranges using very low power levels. The benefit of LoRa is that the end points can be situated in a range of different locations.

Still it is having the capability of being able to communicate with the gateway. The technology is often used for applications ranging from metering, tracking and data monitoring.

### **Arduino Mega 2560**



Arduino Mega 2560

The high-performance, low-power Microchip 8-bit AVR RISC-based microcontroller combines 16KB of programmable flash memory, 1KB SRAM, 512B EEPROM, and a JTAG interface for on-chip debugging. The device supports throughput of 16 MIPS at 16MHz and operates between 2.7-5.5 volts. By executing instructions in a single clock cycle, the device achieves throughputs approaching 1 MIPS per MHz, balancing power consumption and processing speed.

### **GPS (Global Positioning System)**



GPS

The use of GPS may appear at first complicated, but the principle is quite simple. GPS stands for Global Positioning System- a shorter term for NAVSTAR GPS (Navigation Satellite Timing and Ranging)-a system for locating ourselves on earth. It is a satellite- based system created and controlled by the US Department of Defense, initially for military purposes but extended later for civilian usage. It consists of a constellation of 24 satellites (4 satellites in 6 orbital planes) orbiting at an approximate altitude of 20-200km every 12 hours. Each satellite broadcasts two carrier

waves in L-Band (used for radio) that travel to earth at the speed of light.

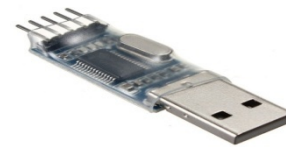
### **Zigbee Transponder**



Zigbee

The Zigbee can transmit the signal over the range of 2km when it placed above 30m from the ground level. Advanced Zigbee transmitter with double relay can cover range of maximum distance up to 80km (in EUROPE) and it send the signal and GPS details about the vessels which crossed the borderline to the nearest coast guard. So that the fisherman life span will save by the coast guard before other country navy reached them. Control over the engine of boat held by guards ones it stopped by Arduino mega2560. Any ZigBee device can be tasked with running the network.

### **USB (Universal Serial Bus)**



USB

USB to UART Converter is a very useful tool for Embedded Systems. Projects which uses UART modules like interfacing GSM, GPS, Bluetooth, Wi-Fi etc. It has 8 data lines, 3 control line, a supply voltage Vic (+5v and a GND. The choice of LCD as an output device was Because of its cost of use and is better with alphabets when compared with a 7-segment LED display. This also shoes the card that is currently being used. By using it we can easily study these modules by sending data directly from your PC and analyzing the received data in your computer display without programming a microcontroller.

### ***LCD (Liquid Crystal Display)***



LCD

A liquid-crystal display (LCD) is a flat panel display, electronic visual display, or video display that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly. LCDs are available to display arbitrary images (as in a general-purpose computer display) or fixed images which can be displayed or hidden. Such as preset words, digits, and 7-segment displays as in digital clock. The same basic technology, except that arbitrary images are made up of a large number of small pixels, while other displays have larger elements. The LCD displays information about the steps that should be followed by the user etc.

### ***Alarm System***



Alarm

When the fishermen crossed the border line which is at first threshold level, the alarm turned on by the activator. The transistor act as a switch is connected between the supply voltages and buzzer unit. Under normal condition, i.e. when the fisherman boat is located inside the border, buzzer will not be activated. When the boat crosses the border limit, closed circuit by turning on the transistor makes the buzzer on, and the alarm is generated.

### ***Wind Speed Sensor***



Wind Speed Sensor

Wind speed, or wind velocity, is a fundamental atmospheric rate. Wind speed is caused by air moving from high pressure to low pressure. Many aspects can be affected by wind speed such as weather forecasting, aircraft, mines, navigation and agriculture, so the observation of wind speed is necessary. An anemometer or wind meter is a device used for measuring wind speed, and is a common weather station instrument.

### ***Emergency Key***



Emergency Key

An emergency is a situation that poses an immediate risk to health, life, property, or environment. By pressing emergency key the default message is send to the NAVY, it intimate the emergency situation of Fishermen. This button is mostly used during cyclone, storm and etc.

## **VII. CONCLUSION**

In previous days fishermen cannot easily find out the border and proper information about climatic condition. With the help of this paper, we can easily identify the border and continuous monitoring of climatic condition using LoRa wireless technology and wind speed sensor. And also we can track the boat location t. Thus the fishermen can easily identify the national sea borders and therefore prevents them from entering their area. Thus saving their lives and providing good relationship with the

neighboring countries. Also, the piracy of ship can be easily brought.

### **VIII. ADVANTAGE**

- Communication becomes very easy.
- Location of any lost boat could be found.
- Accurate determination of location.
- Maintenance cost is low.

### **IX. FUTURE SCOPE**

- Marine traffic can be completely controlled and brought under control.
- We can extend the long range wireless communication using libilium.

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