Life Protecting Device for Fisherman

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Abstract— This paper describes about the handheld device which can be used to detect the cyclone in the mid sea by measuring the environmental conditions. There are many news regarding the natural disaster such as cyclone, tropical storm and hurricanes in the mid sea which has been a threat to fishermen lives. The objective of the proposed work is to develop a handheld device to detect cyclone which helps in overcoming such life threats. The device can be made with low power consumption and high accuracy. The possibly available technologies to detect cyclones and other disaster at sea are the weather forecasting system using satellite and Doppler radar. This is not highly reliable and efficient. It cannot make the fishermen inside the sea to be aware of the cyclone as there is lack of signal availability in the middle of the ocean. So the technique of using barometric pressure sensor, humidity sensor, temperature sensor, rain sensor and vibration sensor to measure the conditions inside sea helps the fishermen to save their lives. The detection and indication of the cyclone approach using Advanced Processor like MSP430G2553 with Embedded system technique is presented in this paper. The sensor data is compared with the ranges mentioned in the coding and if the level increased it means that the cyclone is fast approaching. This is indicated using the LED and LCD display. By using this device fisherman can identify the approach of cyclone and can save their lives for the danger. This device can be made into a cost efficient and a reliable one to prevent accidents. The idea of developing such a device to detect cyclone is explained in this paper. It will be a lifesaving device for fisherman.

Keywords: Life Protecting Device, Fisherman, LCD display, cyclones

I. INTRODUCTION

In recent years there were various accidents in the mid sea due to cyclone. Many news articles have described the deceased count of fisherman due to the unknown approach of cyclone. The earlier studies [1, 2] was based on GPS based location system to locate the fisherman in the middle of the ocean, after the occurrence of natural disasters. It is a location based technology to find the fisherman after the terrible accidents. The research on Wireless temperature and humidity collection system design also the study on temperature and humidity control system by wireless transceiver module CC1101[3],the ideas on wireless temperature measuring system based on DS18B20 [4] ,the details on Wireless temperature and humidity data acquisition system with wireless transmission module NRF905 and 3G internet [5], the study on electromagnetically excited silicon nitride beam resonant pressure sensor with MEMS technology and silicon-rich SiN beams [6], and information's on Pressure Sensor Fabricated with Silicon Fusion Bonding [7] gave the depth idea about the sensors that can be used to the temperature, humidity, pressure, rain and vibrations in the middle of the ocean. Remote Monitoring of Vehicle Diagnostics and Location Using a Smart Box with Global Positioning System and General Packet Radio Service [8] enlightened us with the knowledge of monitoring the environment conditions in the mid sea. The survey on a drag force wind sensor using the torque of cantilever to measure the velocity of wind using ANSYS software, fluid mechanics principle and MEMS-based technology, RTD [9,10] and the details about the Design of the node coordinator based on WSN network as fisherman vessel monitoring system with a component in a fishing boat monitoring system is a node coordinator using Wireless Sensor Network (WSN) technology[12] also helped to enlarge the process of creating a special device with the technique of integrating multiple sensors in a single processor. The survey on the wave speed, wind speed and direction in ocean, the rain fall and precipitation in the seashore also gave new ways to detect cyclone inside sea. The unexpected changes in the climate causes natural disaster such as Cyclone, Storms while fishing inside the sea and makes it a danger for their lives. To avoid that problem this paper gives the exact solution rather than any other methods currently available like weather forecasting system. The major drawback is that the fisherman cannot know the information about the weather when they are inside the sea during fishing for days and months. So, instead of relying on government for weather information's if there is a alert system that gives emergency buzzer alarm or emergency LED lights with a display might really be a helpful for all the fishermen community. To avoid the problem faced by fisherman, this paper provides the solution. Rather than facing the accidents and losing lives without the knowledge about the arrival of cyclones, having a device in hand which tells the weather around them and indicates the sudden changes, will be highly effective and will have wide applications.

II. METHODOLOGY

The handheld device proposed in this paper has been made with the following method. The sensors like Humidity & Temperature Sensor (DHT) to measure the temperature and the humidity in ocean, high accuracy barometric pressure sensor to measure the atmospheric pressure, wind speed or vibration sensors to measure the wind speed, rain sensor to monitor the rainfall are connected to advanced processor like MSP430G2553.The sensor data is given to the processor and embedded coding technique is used. The coding compares the running data from the sensors and the data already encoded in the processor. If the sensor reading exceeds the limit (which is mentioned in the code), exceeded reading is displayed and LED lights glow. When there is intimation of red light it indicates that the cyclone is fast approaching. If the sensor reading does not exceed the limit and orange light glows that indicates the current ocean environment is safe. Normal and Danger data for the different sensors is shown in the table 1.

Environmental conditions	LIMIT RANGE	
	YELLOW LED	RED LED
Wind speed (km/hr)	55- 88	Greater than 89
Air pressure (hPa) (hectopascal)	800 - 896	Greater than 896
Humidity (degree C)	Less than 79	Less than 29
Temperature (degree C)	31 - 37	Greater than 38

Table 1: Sensor Range Values

III. FLOW DIAGRAM

Fig.1 represents the working flow diagram is a collective term for a diagram representing a flow or set of dynamic relationships in a system - life protecting device for fisherman. This flow diagram describes the operation of this life protecting device for fisherman. This flow diagram consists of several shapes of control boxes such as decision, control, arrow etc., it will definitely help fisherman to save their lives from the natural disasters. It displays the alert signal in the form of LED lights to the fisherman if the conditions become true. This indication serves to be the way for the fishermen to save themselves from the danger. The whole process of this operation is simplified in this flow diagram.

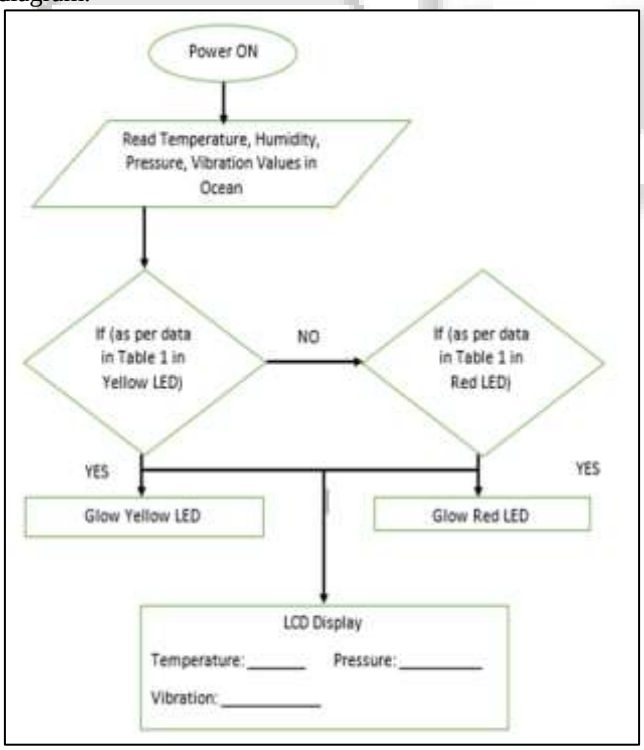

Fig. 1: Flow diagram for Life protecting Device for fisher man

IV. BLOCK DIAGRAM

The fig.2 represents the block diagram for the life protecting device for fisher man.

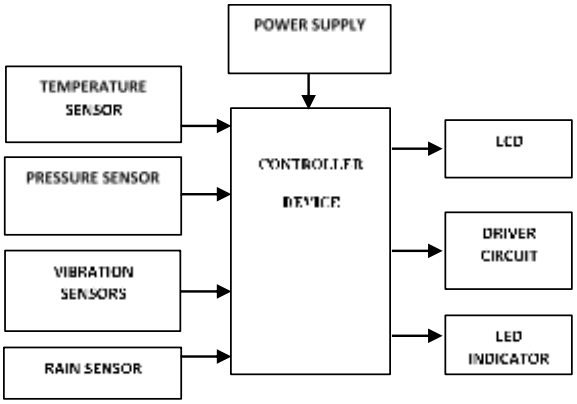

Fig. 2: Block Diagram for Life protecting Device for fisher man.

Fig.2 shows the sensors used in this technique which are interfaced to this model.

V. RESULTS AND DISCUSSION

The Life Protecting Device for fisherman using an advanced processor has been designed to save the fisherman from the natural disaster in the mid sea of the ocean while fishing. Previously the GPS (Satellite Communication) technology is used to safeguard the fisherman by giving cautious information's about cyclones. But it is economically too high to purchase and it needs a proper service provider network & station and parallel in ocean there is a lot of network issues. So, to overcome this problem an idea of designing a device named life protecting device consisting of a Controller interfaced with pressure sensor, humidity sensor, temperature sensor, rain sensor and vibration sensor will be significant. The data collected from the sensors is processed with integration of coding in the processor. This can be made into a handheld device and fisherman can use inside the seas. It measures the values needed to predict the cyclone using the advanced processor and indicates the forthcoming danger. The device stated in this paper is a cost efficient one and can be used by the entire fisherman. It serves to be an easy way to predict the cyclones and prevent accidents. It displays the alert signal in the form of LED lights to the fisherman. During emergency situations, fisherman inside the sea can be alerted using this technique. It can be made into a compact device. The experimental setup of this paper is shown in the fig.3, fig.4 and the LCD output is shown in the fig.5. This paper is a lifesaving one for the fisherman.

Fig. 3: Experimental Setup Output in Normal Weather Condition

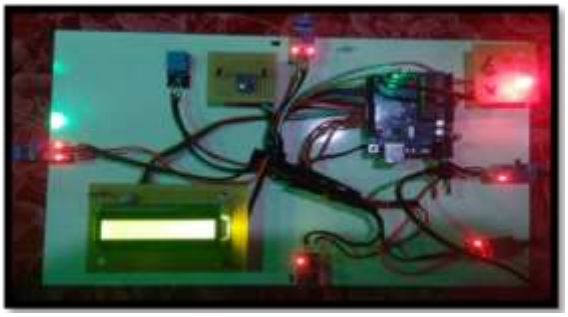

Fig. 4: Experimental Setup Output in Abnormal Weather Condition

Fig. 5: Experimental setup Output for an LCD Display

VI. CONCLUSION

The enhanced technique to develop a device is used to safeguard the fisherman in the ocean. With the help of the idea proposed in this paper, the device named life protecting device for fisherman using MSP430G2553 processor has been developed. It detects the cyclone that approaches the fisherman in mid-sea and indicates the range and the level of dangerousness. This will definitely help fisherman to save their lives from the natural disasters. It displays the alert signal in the form of LED lights to the fisherman. This indication serves to be the way for the fishermen to save themselves from the danger. It can be made into cost effective and compact device. Thus this paper explains the idea of producing a device for the fishermen community that plays a significant role in detecting cyclone while fishing in mid sea.

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