



## Crop Protection from Wild Animals

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### Abstract:

Nowadays, there are several fields in the form of crop yields all over the world. This project estimates any crop or animal-related issue in order to find the best possible solution. The attacks of wild animals on crops in agriculture are lowering agricultural yield. Animal attacks in agriculture are one of the most pressing problems we face today. The attacks by animals cause great suffering to farmers. While trying to evict animals from their homes, people have occasionally also perished. Due to deforestation and a lack of water resources in the forested areas, animals move into agricultural land. After addressing these issues, we came up with the following idea Although India is one of the countries that is quickly urbanising, the majority of Indians (61%) still live in rural regions, making rural development crucial for the efficient growth of the nation. Rural areas also make up 46% of the country's total income. The vast majority of India's rural areas are plagued by a variety of issues that are preventing them from developing. This research paper's primary goal is to examine and comprehend the issues and difficulties that rural communities currently face, as well as to explore and outline the causes of these issues there. The people's living situations are being negatively impacted by these issues, which as a roadblock to expansion and improvement. This study aids in our comprehension of the factors contributing to rural regions' underdevelopment and directs us toward the government's necessary actions to raise citizens' quality of life and promote the development of the rural system as a whole. There are many obstacles in the way of rural areas developing, so it is important to research the issues in order to alert decision-makers, policy-makers, and planners to the concerns [1]

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## I. INTRODUCTION

### 1.1 Introduction to instruments

A One type of computer system called Texas Instruments is primarily made to carry out several activities, including accessing, processing, storing, and controlling data in various electronics-based systems. Texas Instruments (TI) is a manufacturer and designer of analogue and digital semiconductor integrated circuits (ICs). TI creates and manufactures semiconductor solutions for analogue and digital embedded, application processing, and education technology in addition to analogue technologies, digital signal processing (DSP), and microcontroller (MCU) semiconductors [1].

Texas instruments' traits include: The following traits of an embedded

- a. **Speed (bytes/sec): Must be swift**
- b. **Low power dissipation: Power (watts)**
- c. **Size and Weight: As tiny as feasible and light in weight.**
- d. **Accuracy: Must be extremely accurate (%error)**
- e. **Flexibility: Accessibility and height flexibility • Reliability: Must be dependable for a long time.**

In order to be used for real-time applications, Texas Instruments must operate at a high rate of speed, consume very little power, and have a system size that is as tiny as is practical. Readings must also be accurate with a minimum amount of error. The system must be flexible enough to accommodate various scenarios. The following traits define an embedded system.

The main issues in many rural communities, according to a literature assessment, are poverty, illiteracy, unemployment, and Homelessness, crime, social ills, a reduced standard of living, a lack of amenities and services, and poor health. from India's last 20 years. The primary cause of out-migration from rural areas is that there is significant growth and development in cities and urban areas but not in rural communities. Metropolitan areas from rural ones. According to the World Bank, India's rural economy must expand for the country's economy to be robust. Being hampered by a number of issues, including unemployment, illiteracy, and a lack of basic facilities like hospitals, colleges, and schools, cleanliness, etc. Government entities execute numerous policies and activities with the primary goal of boost rural communities' well-being, yet some of these issues are either directly or indirectly to blame for the poor management of plans, strategies, and initiatives. If these issues are not appropriately treated, they worsen and completely impact the negatively affect the entire balance of the nation's development and the rural system

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### ***1.2 Applications of instruments***

There are embedded systems everywhere in the world. The advancement of the microcontroller paved the way for several embedded system applications, which are integral to modern life in one way or another. Embedded systems are pervasive and have grown to be a significant aspect of our daily lives, ranging from consumer devices like digital cameras and DVD players to high-end and sophisticated systems like flight controllers and missile guidance systems. Numerous industries, including digital electronics, telecommunications, computing networks, smart cards, satellite systems, military defense system equipment, research system equipment, and so forth use Texas Instruments products. Real Time Systems is a key idea that is now being discussed. Real-time systems use Real-Time Computing, where a computer must provide

### ***1.3 Motivation***

The most prevalent issue today is related to agriculture. Wild animals are a particular issue for farmers in the modern world. Crops may suffer significant harm from animals. By eating plant pieces or just by racing through the field and trampling the crops, they might harm the plants. Deforestation due to overpopulation causes a shortage of food, water, and shelter in forest areas. As a result, there are more and more instances of animal interference in residential areas, which threatens human life and property and results in conflicts between humans and animals. However, according to nature's laws, every living thing on earth plays a crucial function in the eco-system. Animal invasion in agricultural areas, the backbone of the economy, would result in harm to crops, destruction of grain storage facilities, water supply, homes and other assets, as well as injury and death of people. Pests, natural disasters, and animal damage pose severe hazards to Indian farmers, lowering production. Farmers still use traditional methods, which are ineffective, and it is not practical to hire guards to watch over crops and keep wild animals away. because it is crucial for both humans and animals to be safe. To validate the agriculture issue, many technologies and concepts are used. We worked to create a system that will monitor the field in order to address this issue[4].

### ***OBJECTIVE***

The main goal is to keep animals away from the crops in the farming region. While crossing it, an IR sensor picks up the animal's movement, and an ultrasonic sensor picks up birds flying into the fields. This system will constantly examine the field for any creatures that may be entering[7].

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## **AGRICULTURE-RELATED PROBLEMS**

68.8% of the population and 74% of the labour force of India live in rural areas, making it a predominantly rural country (2011 Census). A constant shift toward urbanisation throughout time has resulted in a decline in the nation's rural population, workforce, and GDP. India's population increased by 12.18 percent (rural) and 31.8 percent (urban) between 2001 and 2011. (rural). 50% of this period's increase in the urban population was attributable to migration and repopulation from the rural areas. Rural areas are classified as urban. India will continue to be predominantly rural until the year 2050, when it is expected that urban populations would surpass those in rural areas, according to population forecasts (UN).

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## **PROPOSED SYSTEM**

In the suggested method, sensors are positioned in the farmland to monitor the crops. We use an IR, an ultrasonic sensor, and GSM in our proposed work. Animal movement is detected by the IR sensor when animals are close by. Following receipt of the initial input signal, the microcontroller will process it further before passing it on to the system for activation. The system will then be shown on the APR board, and the sound will be played to distract the animal while also placing a call to the owner. On the motor, an ultrasonic sensor is attached similarly. Due to its 360-degree rotation, an ultrasonic sensor can find birds in all directions. If an ultrasonic sensor is found, a signal is sent to the controller. For reading the inputs from IR and ultrasonic sensors, a microcontroller block is used. Microcontroller is in charge of the entire process. When movement is detected, a call to the farmer is placed via the GSM module. The farmer is informed that certain birds or animals are trying to access the farm[6]. The block diagram for the Arduino Uno-based smart crop protection system is shown in Fig. 1.

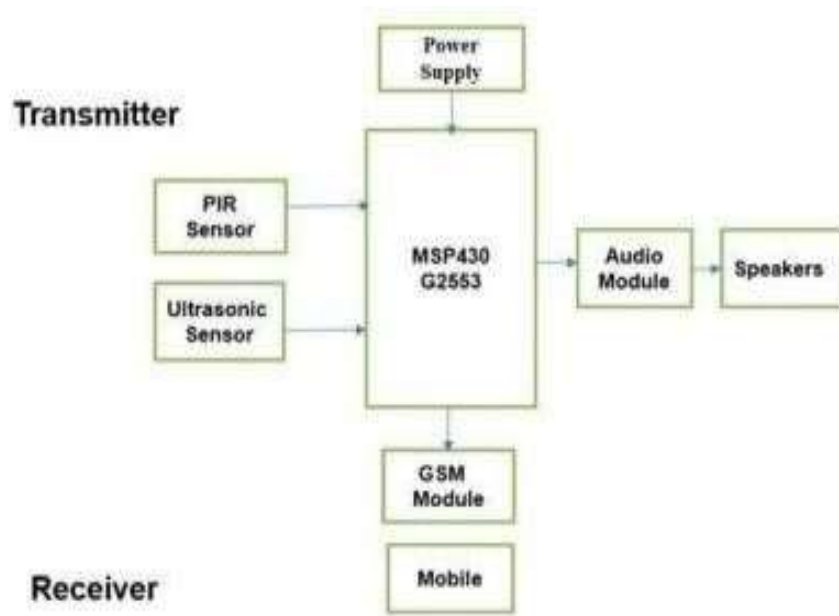


Fig: Trasmmitter Block Diagram [2].

#### **MOTION SENSOR:**

It is an electronic gadget that detects infrared (IR) light from objects in its area of vision and can detect movement up to 10 meters away from the sensor. Since the real detection range is between 5m and 12m, this value is an average. Typically, power is up to 5V. One of the digital pins of an Arduino (or other microcontroller) can be directly connected to the output of a PIR motion detecting sensor. This pin value will be set to "1" if the sensor detects any motion. You may modify the sensitivity and the amount of time the device waits after sensing movement using the two potentiometers on the board[9].

#### **GSM MODULE:**

GSM module and Microcontroller can connect with each other utilizing the standard serial USART protocol and standard GSM modem AT instructions. GSM, which stands for "global system for mobile communication," is a mobile communication modem. 900/1800 megahertz dual band. The SIM card must first be inserted into the GSM module's SIM card tray and locked. If it hasn't already been done, attach the external antenna to the module. The GSM module should be connected to your Arduino using the following connections[11].

#### **APR (Audio Voice Recorder & Playback):**

Along with high-performance audio analog-to-digital converters (ADCs) and digital-to-analog converters, the aPR33A3 is a potent audio processor (DACs). It is appropriate for basic interfaces or when the length of a single message needs to be limited. It can record and playback the message on average for 1, 2, 4 or 8 voice messages by switching. There are 8 output pins on the APR33A3 Voice Recorder & Playback Module, numbered M0 to M8. Arduino can be attached to one of the pins. The module pin will be activated by the digital low input, which can be utilised to play back the voice message that has been recorded. I chose M1 and wired it to the Arduino D8

#### **8 Ohm speakers:**

The speaker's main function is to generate audio output that listeners can hear. The transducers that are utilized to transform electromagnetic waves into sound waves are speakers. From computers or audio receivers, it receives audio input. The speaker receives input in analogue or digital form. While digital first converts the input into analogue and then amplifies it, analogue speakers simply magnify electromagnetic waves into sound waves[13]

#### **An unfavourable economic climate for implementing expensive technology**

Adopting expensive technology in rural areas is hindered by a number of factors, including pricing, accessibility, lack of availability, and inadequate human talent. Because of the lower economic standards in rural areas, people cannot purchase new technologies. By implementing new technology, we may improve the economic climate, increase people's income, and thus raise their living standards. Although it may be difficult for an individual to acquire such technology, a community or government should take the initiative to provide it in remote areas.

### *Ineffective farming*

The backbone of the Indian economy is agriculture, although the rate of increase of agricultural output is rapidly slowing down. Agriculture's relative GDP contribution was 30% in 1990–1991 and dropped to 15% in 2011–2012. Despite employing more than 51% of the workforce, agriculture only accounts for 17.4% of economic output. Dependence on weather and rainfall, open borders for agricultural imports, reduction of agricultural subsidies, lack of easy access to credit for agriculture and reliance on money lenders, decline in government investment in the agricultural sector, and conversion of agricultural land for non-agricultural uses are the main causes of inefficient agriculture. The impact of India's agricultural sector's crisis is enormous and likely to affect the national economy and all other sectors[15]

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## CONCLUSION

In the present, crop vandalism by wild animals has grown to be a significant social issue. As a result, this project has significant social significance because it seeks to solve this issue. Finally, crop security from wild animals is constantly tested. With its cheap cost and simple to understand approach, this invention offers accurate and dependable findings. It will also assist farmers in safeguarding their crops and orchards and prevent them from suffering significant financial losses. Additionally, the technology employed in this project is readily accessible. Small scale industries can use this idea because it can be produced into a product and sold on the market. This project has a flaw despite being trustworthy. When a, the programmer becomes complex when a large number of people are drawn to a single crop, since several factors must be taken into account. Therefore, we can split it into various groups to make development easier. Once more Ultrasonic sensors are taken into account, the project becomes more complicated. The verification process to warn the farmer will be more challenging if three sensors are used. because the verification procedure for each type of ultrasonic sensor varies. As a result, the software becomes more complex when using additional Ultrasonic sensors, and occasionally the controller is unable to handle it. We must restrict the number of Ultrasonic sensors connected to the controller in order to circumvent this remedy. Additionally, this effort will aid in increasing food yields, improving their economic wellbeing

Due to historical repercussions, deficiencies in our planning methodology, and our investment pattern, rural areas are still underdeveloped and neglected despite the existence of numerous initiatives for their development. In order to achieve sustainable rural development, it is imperative that rural issues be addressed and appropriate policies are put in place. The main objectives of rural development are to expand access to and distribution of basic commodities to all rural inhabitants as well as to raise the standard of living of rural residents by enhancing their socioeconomic, educational, and employment opportunities.

### *FUTURE ENHANCEMENT*

The application of this system will have a broad range in the future. Information is collected using IR and ultrasonic sensors, which are then communicated over GSM. This endeavor is the wireless sensor network further enhances. The kind of sensors that can measure the soil's moisture content, a crop's growth, and its nutritional value. These sensors collect information that helps farmers and allow them to monitor farmland from anywhere in the world.

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