SOLAR-POWERED DEFENSE: SAFEGUARDING YOUR CROPS WITH SMART FENCING AND ALERTS

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ABSTRACT: The extend points at creating a sun oriented fencing, which makes a difference agriculturists to maintain a strategic distance from their edit harm ordinarily happen due to creatures. Sun oriented vitality is utilized to control up the fence through stun era circuitry. And too the framework employments IR sensor to identify the creatures and gives the caution through Buzzer and sending the caution message through GSM. Electric wall can be utilized to secure farmhouses, farmlands, timberland bungalows, etc from creatures. In a way, these reenact the work of a rancher or timberland protect. As of now prevalent in nations where labor is costly, electric wall are gradually getting to be well known in India as well. These control the creatures by giving them a brief, sharp but secure stun that educates them to remain absent from the fence. In this way electric wall are temperate and down to earth arrangements to maximize field generation through controlled touching. The extend makes utilize of a sun oriented plate. The sun powered vitality gotten is put away to a battery. The battery supply is bolstered to beat generator and in turn to a MOSFET which is competent of creating ON/OFF beats of diverse frequencies. This is encouraged to a step up transformer to produce a moo voltage AC. This AC is bolstered to electrical fence, which will donate stun when any creature comes in contact with it.

INTRODUCTION

The project aims at developing a solar fencing, which helps farmers to avoid their crop damage usually occur due to animals. Solar energy is used to power up the fence through shock generation circuitry. And also, the system uses PIR sensor to detect the animals, if the system detects animals it will gives the alert through Buzzer and sending the alert message through GSM.

Electric fences can be used to protect farmhouses, farmlands, forest bungalows, etc from animals. In a way, these simulate the job of a cowboy or forest guard. Already popular in countries where manpower is expensive, electric fences are slowly becoming popular in India as well. These control the animals by giving them a short, sharp but safe shock that teaches them to stay away from the fence. Thus, electric fences are economical and practical solutions to maximize field production through controlled grazing.

The project makes use of a solar plate. The solar energy obtained is stored to a battery. The battery supply is fed to pulse generator and in turn to a MOSFET which is capable of generating ON/OFF pulses of different frequencies. This is fed to a step-up transformer to generate a low voltage AC. This AC is fed to

electrical fence which will give shock when any animal comes in contact with it. and also, this AC power is used to turn ON the BULB.

The major features of this project are:

1. Storing solar energy.
2. Creating shocking circuitry.
3. To send the alert message using GSM Technology.
4. Audible alerts using buzzer.
5. Visible alerts using LED.
6. PIR sensor-based animal detection.
7. Converting DC to AC using inverter.
8. Using PIC Microcontroller to achieve this task.

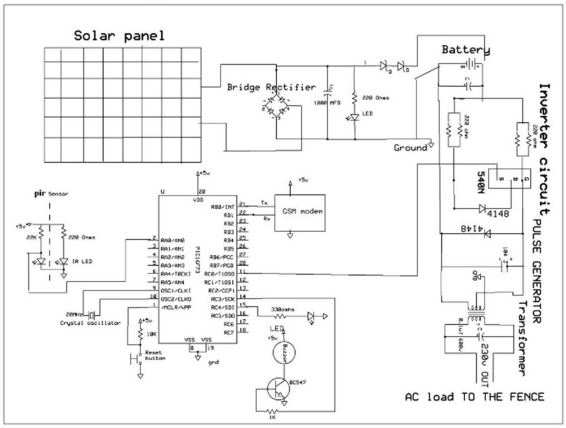
9. METHODOLOGY

The methodology for implementing the Solar Fencing project follows a systematic approach aimed at effectively preventing crop damage by animals while integrating SMS alerts for real-time monitoring. Beginning with a needs assessment, the project delves into understanding the specific challenges faced by farmers, considering geographical and environmental factors. A thorough feasibility study evaluates the practicality of solar fencing in the target agricultural area.

Following these initial stages, the project moves to prototype development and field testing, allowing for the identification and resolution of technical issues

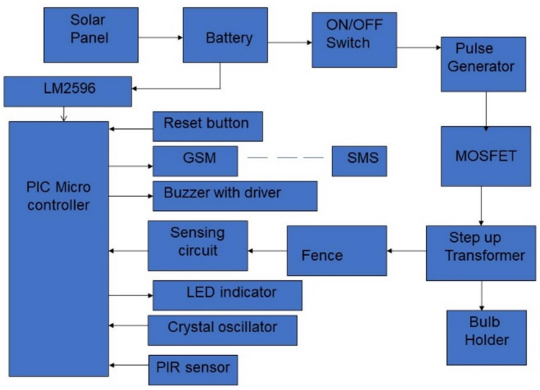
MODELLING AND ANALYSIS

A modeling analysis of utilizing solar fencing to mitigate crop damage by animals, coupled with SMS alerts, necessitates a multifaceted approach. Firstly, the problem scope must be meticulously defined, encompassing the specific crop types affected and the range of animal threats. Subsequently, a thorough investigation into the efficacy and cost-effectiveness of solar fencing is imperative, considering factors such as installation expenses, maintenancerequirements, and ecological sustainability.



Modeling the effectiveness of solar fencing entails intricate considerations, including fence height, material durability, and the behavioral patterns of target animals. Integration of SMS alerts further complicates the analysis, requiring an evaluation of technological feasibility, sensor deployment strategies, and associated costs. Risk assessment is crucial to anticipate technical failures or false alarms, warranting robust contingency plans. Continual evaluation and optimization are paramount, enabling refinement based on real-world feedback and data-driven insights.

Block diagram

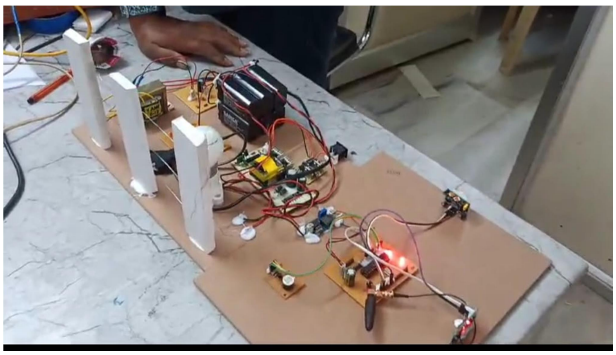


Moreover, sustainability and scalability considerations underscore the long-term viability of the solution, urging exploration of renewable energy integration and adaptability to varying environmental contexts. Through this comprehensive approach, a modeling analysis can elucidate the potential efficacy and viability of solar fencing with SMS alerts in safeguarding agricultural yield from animal intrusion.

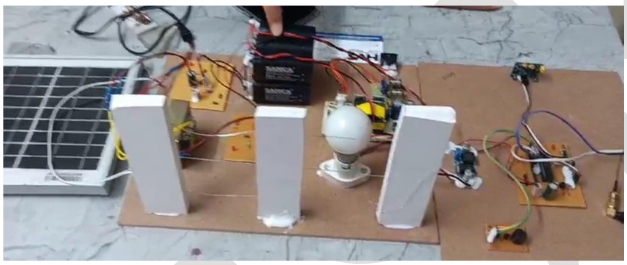
RESULTS AND DISCUSSION

The project "**Solar fencing to prevent crop damage by animals and SMS alerts**" was designed developing a solar fencing, which helps farmers to avoid their crop damage usually occur due to animals. Solar energy is used to power up the fence through shock generation. Solar energy is obtastored into the rechargeable battery through charging circuit. This battery power is converting to AC with the help of inverter. When the PIR sensor detects the animal,it will give to the microcontroller then the controller gives the alert through buzzer and sending the alert message through GSM. To achieve this task microcontroller loaded program written in embedded C language

In future we can extend the project in a way such that the output from the solar plate is increased. This can be done by increasing the dimensions of the solar plate. In future we can use this project in several applications by adding additional components to this project like devices, water pumps etc.



In future we can use this project in order to control devices automatically in fields alike water pumps control and intimation of environmental conditions. This kind of automation provides greater advantages like accuracy, energy conversation, and reliability and more over the automated systems do not require any human attention.



As the energy conversation is very important in the current scenario and should be done to a maximum extent where ever it is possible. We can extend the project using wireless camera for viewing the security levels. We can extend this project by adding field crop protection to protect the field from rain

CONCLUSION

The project concludes a design of "**Solar fencing to prevent crop damage by animals**" such that the fencing to the crops or fields from solar plate generates solar energy and utilizing this energy for fencing system.
Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested.

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