

Smart Agri Security Pole

**Harish A. Patil¹, Sarvesh Chaudhari², Devyani Falak³, Vaishanav Chaudhari⁴,
Rudresh Sartale⁵, Gaurav Dandekar⁶**

¹ Assistant Professor, Electrical Engg. dept, GF's Godavari CoE, Jalgaon
^{2,3,4,5,6} UG student, GF's Godavari College of Engineering, Jalgaon, India, 425001,

sarveshchaudhar930@gmail.com

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Abstract – The Smart Security Pole is a revolutionary device that combines multiple features to provide enhanced security and convenience. The pole is equipped with a lightning protection system to prevent damage from lightning strikes, a power fencing system to deter intruders, and a 24-hour monitoring system to alert users of any suspicious activity. Additionally, the pole has a mobile charging system, allowing users to charge their devices on the go, and a spray pump charging system, enabling the device to be used for agricultural purposes. These features make the Smart Security Pole an all-in-one solution for security, convenience, and agricultural needs. The device is designed to be durable, easy to use, and cost-effective.

Keywords- Security, shock fencing, monitoring

I -INTRODUCTION

One of the most important sectors in the world, agriculture provides food and other necessities to people all over the world. Theft, vandalism, and crop damage are just a few of the security issues that this business is susceptible to. The smart security pole for agricultural is one of the creative solutions that have been created to address these problems.

A highly advanced tool called the "smart security pole" is intended to improve security and monitoring in agricultural settings. It has cutting-edge sensors and cameras that make it possible to monitor equipment,

livestock, and crops in real-time. The intelligent security pole can also identify and warn farmers of potential security risks like theft or trespassing.

A cutting-edge solution that can assist farmers in protecting their crops and enhancing their overall farming operations is a smart security pole for agriculture with electric shock fence, a mobile charger, and a spray pump charging unit. This cutting-edge system employs sensors, cameras, alarms, and electric shock fencing to keep pests and wildlife out of the fields while simultaneously giving farmers real-time agricultural monitoring. Additionally, by using solar-powered charging units, the mobile charger and spray pump charging unit encourage sustainable agricultural practices while offering farmers practical on-site charging alternatives for their gadgets and equipment. Overall, farmers who want to run their fields more successfully and efficiently should consider investing in the smart security pole for agriculture.

Additionally, the smart security pole may be combined with other farming technology, such irrigation systems and weather sensors, to provide farmers a complete solution. Through this connectivity, farmers can remotely monitor and manage their activities, increasing production and efficiency.

This introduction gives a general overview of the smart security pole for agriculture while emphasizing its significance in offering a trustworthy and efficient security solution for the sector. The characteristics and advantages of the smart security pole for agriculture will be covered in more detail in the parts that follow,

including how it can enhance security, boost production, and provide farmers a cost-effective solution.^[1,4]

II-LITERATURE REVIEW

The smart security pole with electric shock fencing is one technological advancement that has drawn attention in recent years as the use of technology in agriculture has grown quickly. The smart security pole with electric shock fencing for agriculture will be the subject of a study of the literature in this part, which will also highlight significant findings from various investigations.

In a study the ability of the electric shock fencing to lessen deer damage to crops was assessed. The electric shock fencing was found by the researchers to be quite successful at preventing deer from entering the crop fields, which led to a considerable decrease in crop loss. The study found that the smart security pole with electric shock fencing was a dependable and affordable method of preventing wildlife damage to crops.

The possibility of using an electric shock fence coupled with a smart security pole to deter theft and vandalism in agricultural settings. The electric shock fencing, which the researchers discovered to be quite successful in preventing trespassers from entering the farm and tampering with equipment, led to a significantly lower rate of theft and damage. The study came to the conclusion that the smart security pole with electric shock fence was an effective way to improve security and oversight in agriculture.

The electric shock fence affected agricultural productivity and quality. The scientists discovered that the use of electric shock fencing reduced crop damage brought on by animals, resulting in an increase in crop output and an improvement in crop quality. The study came to the conclusion that the electric shock fence and smart security pole were useful tools for boosting crop quality and agricultural output.

The literature evaluation concludes by highlighting the potential of the electric shock fence and smart security pole to improve security and monitoring in agriculture. The gadget is a useful tool for farmers since it may prevent wildlife damage, theft, and vandalism as well as increase agricultural output and quality.^[2,3]

III - METHODOLOGY

1. Design and Planning: The first stage is to design the smart security pole with the necessary features, such as

solar energy, mobile charging, electric shock fence, and mobile charging for spray pumps. The design need to be based on the pole's intended use as well as the particular requirements of the site where it will be erected. Specifications regarding the materials to be utilized, the pole's measurements, and the arrangement of the different elements should all be included in the design. Procurement of Materials: Once the design has been finalized, the necessary materials for the smart security pole should be procured. This may include solar panels, batteries, fencing wires, mobile charging sockets, spray pump charging sockets, and other necessary components. The materials should be of high quality and sourced from reliable suppliers.

2. Building the Pole: Building the smart security pole is the next phase. To construct the pole structure, welding, drilling, and other manufacturing methods may be used. To avoid electric shocks, the fence wires should be securely fastened to the pole and insulated. The pole should have simple mounting locations for the spray pump and mobile charging connections.
3. Installation of Solar Panels and Batteries: For best effectiveness, the solar panels should be mounted on the top of the pole, facing the sun. The batteries have to be set up either inside the pole's framework or in a separate enclosure at the pole's base. The cabling connecting the solar panels, batteries, and other pole components must be correctly linked.
4. Testing and commissioning: The smart security pole should be checked to make sure it performs as intended once it has been manufactured and all components have been correctly placed and linked. This might involve solar power production, mobile charging, and spray pump charging, and testing the electric shock fence. Before commissioning the pole for use, any problems or faults should be addressed and fixed.

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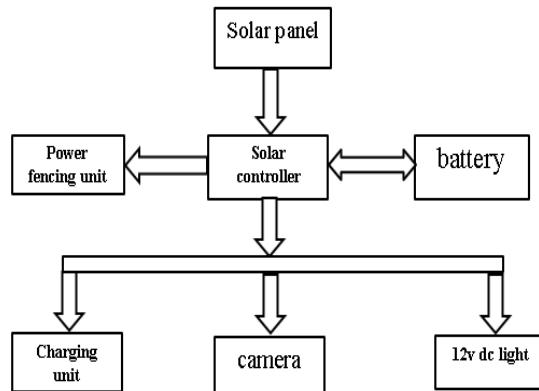


Fig. 1-Block Diagram

Depending on the particular requirements of the farm, many designs of smart security poles with electric shock fence may be used. However, the following elements are frequently present in the design:

The pole structure is the primary part of the intelligent security pole. It gives the electric shock fence, sensors, cameras, and other components the support they need. The pole construction needs to be strong and resilient enough to stand up to adverse weather and possibly animal contact..

Smart security poles can be powered by solar energy, which is a common and environmentally beneficial choice. The pole's top can be covered with solar panels to collect energy from the sun, which is then put into a battery for later use. Even where there is little or no access to energy, solar power remains a dependable choice.

Electric shock fence: This type of fencing is intended to act as a barrier, keeping animals off the farm. It has conductive construction and is powered by electricity, acting as a secure and reliable deterrence without endangering the animals.

Cameras: The smart security pole may be equipped with cameras to give video surveillance of the farm. The cameras' ability to spot and document any unusual activity enables farmers or security professionals to remotely monitor the farm and immediately react to any possible security breaches.

Alarms: To warn farmers or security professionals of potential security breaches, alarms can be mounted on the smart security pole. When an animal or person enters the farm, the alarms may be linked to the electric shock fence to send out a signal.

Control Panel: The smart security pole's primary node is the control panel. It is the location where the information gathered from the cameras and alarms is processed. The control panel is in charge of regulating the sensitivity of the sensors, turning on the electric shock fence when an animal is spotted, and setting off the sirens if a security breach is noticed.

In conclusion, a strong pole construction, electric shock fence, cameras, alarms, power supply, and a control panel are all included in the design of a smart security pole for agricultural. These elements combine to offer a complete security solution for farms, guarding against

animal damage to crops and lowering the possibility of financial losses.

V- RESULT & DISCUSSION

The results of implementing a smart security pole for agriculture- Increased agricultural yields: Farmers may prevent pests and wildlife from damaging their crops by installing a smart security pole. By discouraging animals from accessing the fields, the electric shock fence can lessen crop damage and boost harvests.

Enhanced farm security: Farmers can monitor their fields in real-time using the smart security pole's electric shock fence, sensors, cameras, and alarms. Farmers that use the system will be informed of any possible security breaches, enabling them to take immediate action and reduce losses.

Convenient charging options: Farmers have the option of charging their smartphones and equipment on-site thanks to the mobile charger and spray pump charging unit. Farmers will save time and money by not having to drive far in order to recharge their gadgets or machinery.

Savings: The electric shock fence, sensors, cameras, and alarms on the smart security pole can eliminate the need to hire additional security guards, saving farmers money on labor. In addition, using solar-powered charging equipment can save money in the long run by lowering electricity expenses.

Sustainable agricultural methods: Using solar-powered charging devices is a green choice that lessens the carbon footprint of agricultural activities. This encourages sustainable agricultural methods, which are advantageous to the society and the environment.

Overall, farmers may get a variety of advantages by putting in place a smart security pole for agriculture with electric shock fence, a mobile charger, and a spray pump charging unit. The smart security pole can be a worthwhile investment for farmers due to increased crop yields, increased farm security, cost savings, and sustainable farming methods.^[5]

VI- CONCLUSION

In conclusion, farmers may find it worthwhile to invest in a smart security pole for agriculture that includes electric shock fence, a mobile charger, and a spray pump charging unit. This device can help safeguard crops from harm from pests and animals while also giving farmers

real-time farm monitoring for increased security. With the usage of solar-powered charging systems, the convenience of on-site charging alternatives promotes sustainable agricultural practices while saving farmers time and money. Generally speaking, the smart security pole may provide farmers a number of advantages, such as higher crop yields, enhanced farm security, cost savings, and eco-friendliness. Therefore, installing a smart security pole may assist farmers in managing their farms more successfully and efficiently, which eventually results in increased profitability and sustainability in the long run.

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REFERENCES

- [1] *Smart Farming Security Systems*" by A. H. Aamir, A. Ahmed, and S. Ahmed. IEEE International Conference on Computing, Electronics & Communications Engineering (IEEE ICCECE), 2018.
- [2] *Rangelands* 9(4), August 1987, "Electric Fencing" Robert E. Steger :/Users/hp/Downloads/10942-10484-2-PB.pdf
- [3] *Marcelo Giovanni B. De Martino, Fernando S. dos Reis, Guilherme A, D.Dias , Study and Implementation of an Electric Fence Energizer, IEEE Transactions on Power Electronics Specialists Conference, June 2006.*
- [4] "Security challenges to smart agriculture: Current state, key issues, and future directions" vol.8, December 2020: <https://www.sciencedirect.com/science/article/pii/S2590005620300333>
- [5] <https://easternpeak.com/blog/smart-agriculture-monitoring-solutions-to-optimize-farming-productivity/>
- [6] wikipedia.org