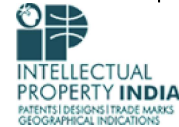


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Patent Search

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Abstract:

The invention provides an integrated, intelligent system for predicting agricultural flooding and autonomously activating rapid-drainage mechanisms to prevent crop damage. The system employs an IoT environmental sensing network to collect real-time rainfall, soil-moisture, water-table, and field-condition data, supplemented by meteorological, hydrological, and geographical datasets. A Machine Learning Prediction Engine analyzes these inputs to generate accurate, plot-level flood-risk forecasts. A Control and Decision Unit interprets the predictive output and actuates pumps, valves, and drainage pipelines through an automated drainage-actuation module. A communication interface enables continuous data exchange, while cloud analytics and a user-alert interface support monitoring and model refinement. The system achieves proactive drainage, reduces crop risk, and provides a scalable, adaptive flood-mitigation solution for agriculture.

Complete Specification**Description: FIELD OF THE INVENTION**

[001] The present invention relates to the domains of hydrological engineering, precision agriculture, environmental analytics, automated civil infrastructure, and machine learning-based disaster-mitigation systems. More particularly, the invention concerns an integrated flood-prediction and automated rapid-drainage infrastructure system designed to protect agricultural crops from flood damage by combining multi-source environmental data processing, machine learning-based hydrological forecasting, IoT-enabled field monitoring, and intelligently actuated drainage mechanisms. The invention lies at the intersection of predictive environmental modeling, smart irrigation and drainage engineering, embedded sensor networks, and autonomous water-management systems, enabling proactive removal of rainwater from farmlands based on dynamically computed flood-risk predictions.

BACKGROUND OF THE INVENTION

[002] Agricultural lands in monsoon-prone and flood-susceptible regions frequently suffer irreversible crop loss due to sudden accumulation of rainwater, inadequate drainage, and the absence of real-time hydrological intelligence. Existing water-management and drainage infrastructures are predominantly manual, reactive, and dependent on human intervention. Such systems generally rely on fixed-capacity drains or rudimentary pumps that are activated only after significant waterlogging has occurred. Consequently, conventional systems fail to protect crops during rapid rainfall events, short-duration cloudbursts, or consecutive rainfall cycles where drainage

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