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Application of GIS and Remote Sensing in Paddy Crop Identification and Yield Estimation

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ABSTRACT

The application of Geographic Information System and Remote Sensing has become increasingly important in modern agriculture for the identification and yield estimation of Paddy. These technologies provide accurate, timely, and large-scale information about crop distribution, growth conditions, and productivity. Remote sensing uses satellite imagery and aerial data to monitor agricultural fields and detect different crop types based on their spectral characteristics. This helps in identifying paddy cultivation areas and distinguishing them from other crops. Various vegetation indices, such as the Normalized Difference Vegetation Index (NDVI), are widely used to assess crop health and growth stages. These indices help researchers analyze plant vigor, chlorophyll content, and stress conditions such as drought or pest infestation. Meanwhile, GIS technology plays a crucial role in storing, managing, and analyzing spatial data obtained from remote sensing. It enables the creation of detailed maps that show the distribution of paddy fields and variations in crop conditions across different regions. By integrating GIS and remote sensing data, scientists and agricultural planners can estimate paddy crop yield with greater accuracy. This information is useful for agricultural planning, food security management, and policy-making. Overall, these advanced technologies improve crop monitoring, support efficient resource management, and contribute to sustainable agricultural development.