

Application of GIS in Agriculture

Geographic Information System (GIS) is a computer-based toolkit used to store, retrieve, analyze, and display spatial or geographical data. In agriculture, it helps farmers and scientists create detailed digital maps of a farm to monitor critical factors such as soil health, water availability, and crop growth.

Key Applications in Agriculture

Crop Yield Estimation: By using satellite imagery (such as Landsat or Sentinel-2) and GIS models, experts can predict harvest volumes (e.g., paddy, wheat) before the crops are even cut.

Assessment of Soil Fertility: GIS allows for the mapping of different nutrient levels across a field. This enables "variable rate application," where farmers apply fertilizer only where it is actually needed rather than treating the entire field uniformly.

Analysis of Cropping Patterns: This involves monitoring which crops are grown in specific regions and how these patterns change across different seasons.

Evaluation of Drought Conditions: GIS is used to identify areas that are not receiving sufficient water, allowing for better irrigation planning and water resource management.

Pest and Disease Control: GIS helps in detecting early signs of pest attacks or crop diseases from space or the air, allowing for quick intervention.

Example: Identifying "Late Blight" in potatoes or regional insect infestations using aerial videography.

Precision Farming

The document emphasizes that GIS, when combined with GPS and Remote Sensing (RS), leads to Precision Agriculture.

This modern farming concept involves treating every specific part of a field based on its individual needs, rather than treating the whole farm in the same way. This targeted approach significantly reduces costs and minimizes chemical use, making farming more sustainable and efficient.