

# Gaining Better Produce with GIS: Higher Accuracy in Soil Health and Crop Yield Management



Geographic Information System (GIS) has significantly transformed agricultural practices, particularly in soil health and crop yield management. By integrating GIS technology with farming practices, farmers are able to achieve more efficient and precise management, ultimately improving both the quality and quantity of their produce.

In a conversation with **Dr. Jaya N. Surya, Principal Scientist and Head, ICAR - NBSS & LUP, Regional Centre, Delhi**, we explored how digital soil mapping using GIS is benefitting planners, farmers, stakeholders, and developmental agencies.

## What are the core functions of ICAR and the National Bureau of Soil Survey & Land Use Planning?

ICAR's main mandate is to maintain land resource inventories and to take care of soil health and its management, and the

National Bureau of Soil Survey & Land Use Planning's mandate is to undertake soil survey and mapping, its classification, and correlation for the identification of constraints and potential. On the basis of this identification, we can manage and monitor soils and inform farmers how to utilize the land resources in a sustainable manner.

## For what purposes are you using GIS?

We use GIS for digital soil mapping. For digital soil mapping, we analyze the terrain parameters, and on these attributes/parameters, we prepare the base maps for soil surveys. Geospatial techniques are very useful for soil surveys, especially for large areas. They are cost and time effective. Using geospatial techniques, we can generate detailed site-specific information and identify constraints and potentials, which prove very useful for creating detailed soil and other thematic maps.

## What are the benefits of using GIS?

The National Bureau of Soil Survey's main mandate is soil survey and mapping. In digital soil mapping, we interpret all the digital terrain parameters. On the basis of these parameters, we characterize the soil properties and create soil maps. As part of our land resource inventory program, we create regional maps as well as various thematic maps. These region-specific maps are very useful for planners, farmers, stakeholders, and developmental agencies.

## How do farmers benefit from the use of GIS?

We are generating datasets for different regions. The farm-level data benefits farmers. We run many projects for sustainable land use planning, and land evaluations for crop suitability for particular regions including cash crops that are beneficial



for farmers. We in the Bureau, are also working on watershed development programs such as reward and LRI-PMKSY-2.0. In these programs, soil and watershed development plans are generated and soil and water conservation measures for every farm in a particular region are suggested. This is beneficial for farmers and stakeholders.

We also develop detailed soil information maps. We are distributing land resource inventory cards. In those cards, we provide information about 12 important parameters of soil along with other soil characteristics and morphological features and give a range of that (low, medium, high). According to those low, medium, high parameters, we suggest the nutrient requirement of particular farms. This is very important information for the farmers as it helps them manage and monitor the fertilizer dosage and maintain soil health and crop yield. All these data are interpreted on the GIS platform in a short period of time and with utmost accuracy.

