# Zero Hunger

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Crop Monitoring via Remote Sensing: From Earth Observation Satellites

Automated crop monitoring is an active and important component in ensuring food security and to understand the effects of agriculture on climate. Moreover, the precise and in time assessment of crop health is crucial for numerous applications pertaining to agricultural monitoring. With recent advances, remote sensing provides the most cost-effective method of crop monitoring via several in-orbit satellites providing archived time-series data. NUST, in collaboration with SUPARCO, Pak Space Agency, has delivered a project that enables monitoring of crops in different parts of the country using satellite imagery and data. The project aims to devise a mechanism for timely action in case crops are getting affected, thus ensuring the best yield.
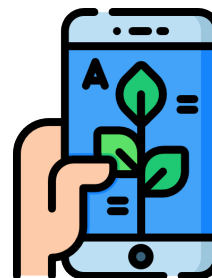
Smart Phone-Based on-tree mango Fruit Quantity and Quality Estimation using near-infrared Spectroscopy and Machine Vision

Pakistan produces approximately 1.8 million tons of mango fruit per year, equivalent to about 8.5 % of the world's total mango production. With world's fourth-largest exporter, approx. 90,000 tons of mangoes are exported annually. With this scale of activity in export markets comes a need to improve farm management, predict harvest volumes, coordinate harvests and market logistics.

NUST has thus delivered an application for the farmers for on-tree mango Fruit Quantity and Quality Estimation using near-infrared Spectroscopy and Machine Vision that enables the farmer to better manage the entire ecosystem of mangoes, resulting in increased productivity.

GrISt: Green Internet of Things (IoT) for climate smart-agriculture

One of the key challenges which developing countries with high population density face is doubling the production of food by 2050 to serve increased demand while facing the reality of climate change. Therefore, precision agriculture is being adopted by the agriculture sector that increasingly depends upon technology adoption.

GRiST is a NUST project geared towards the development of technology enabler i.e, low-cost sensors by exploiting recent advancements in IoT. This would result in affordability, thus enabling large scale adoption of precision agriculture in Pakistan's agriculture sector.