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PARAMETRIC INDEX INSURANCE FOR KENYAN SMALLHOLDER FARMERS BASED ON  
SATELLITE DERIVED SOIL MOISTURE.

**Abstract**

Smallholder farmers in Sub-Saharan Africa are facing increasing challenges due to climate variability and extreme weather events, which threaten their agricultural production, livelihood, and food security. These farmers are exposed to significant income losses during production and at risk of losing their investments due to climate change-related events, such as droughts and excessive rainfall. While crop insurance schemes can provide some buffering from climate-related losses, new technological innovations are needed to make these schemes more effective and scalable for smallholder farmers.

High resolution soil moisture data derived from satellite observations is one such promising technology for crop monitoring, particularly for smallholder farmers in Sub-Saharan Africa who are vulnerable to climate-related risks. This data has untapped potential to support the development of index-based insurance, as it can provide accurate assessments of crop losses. Planet Labs, a leading provider of global satellite-observed data, has developed a parametric index-based insurance product that utilizes high resolution soil moisture data to assess crop losses.

The soil moisture data is derived from passive microwave satellite observations, and Planet Labs has developed a patented algorithm to downscale the measurements to 100x100m resolution, providing near real-time and long-term (20 years) data for crop monitoring. The near real-time high-resolution soil moisture data has been shown to be scalable and affordable to farmers, covering 9 different seasonal staple crops across more than 20 counties in Kenya.

To improve the resilience of currently uninsured Kenyan smallholder farmers against climate-related risks, ACRE Africa and CIAT have partnered with Planet Labs under the Insuresilience Solution Funding (ISF) co-funding. The pilot phase of this program has enabled the insuring of 11,500 smallholder farmers and provides valuable insights for climate-smart agricultural practices. Bundling micro-insurance services with advisories on good agricultural practices presents a feasible strategy of making micro-insurance effective and relevant to farmers.

By utilizing high resolution soil moisture data, crop monitoring can be more accurate, and crop insurance schemes can be more effective in providing buffering against climate-related losses for smallholder farmers. Ultimately, this can improve their livelihood security and support them to escape the poverty cycle.