CASE STUDY BRIEF

Agriculture Case Studies

Using satellite indicators to support crop, irrigation, and smallholder program decisions

What this resource provides

Three illustrative workflows show how teams can combine repeat satellite observations, field checks, and clear escalation rules. They are scenarios, not claims of named customer results.

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How to read these cases

The cases in this brief are designed for program and technical teams evaluating an environmental monitoring workflow. Each starts with a decision, identifies the observable signal, and ends with a field or operational action. The examples intentionally avoid presenting modeled values as ground truth.

A practical deployment should define the area of interest, observation period, data-quality rules, and validation sample before using an indicator for a high-consequence decision.

- Use trends and spatial patterns to prioritize attention, not as a substitute for agronomist or field verification.
- Record acquisition date, cloud conditions, index definition, and any masking applied to every decision-facing result.
- Agree in advance what signal triggers a field visit, advisory, or program review.

Case 1 — Coffee yield optimization in Rwanda

A cooperative wants to prioritize agronomy visits across dispersed coffee plots before the next advisory cycle. The monitoring question is not “what is the yield?” but “which plots show a persistent change in canopy condition that merits inspection?”

A reference workflow compares a vegetation-index trend for each plot with recent rainfall context and a small set of field observations. Areas with a sustained decline are placed on a visit list; areas with a stable signal remain on routine monitoring.

- Define plot boundaries and a baseline period that spans more than one observation.
- Review cloud and haze masks before comparing dates.
- Pair the satellite signal with plot notes such as pruning, pests, shade, or harvest timing.
- Use the next field round to confirm whether the signal corresponds to a management issue.

Case 2 — Maize disease triage in Kenya

An agricultural program receives reports of uneven maize performance across counties. Satellite data can help triage where to look first by revealing unusual within-season vegetation patterns, but disease diagnosis still belongs to trained field staff.

The team creates a ranked map of field blocks with an abnormal change relative to nearby fields and recent observations. Extension officers use the map to schedule visits and capture consistent diagnostic notes.

- Compare like-for-like crop stages where possible; phenology can explain normal variation.

- Separate “needs inspection” from “confirmed disease” in all dashboards and reports.
- Store field observations with date, location, crop stage, and diagnosis confidence.
- Review false positives at the end of the season to improve rules and training.

Case 3 — Irrigation efficiency for rice farms in Tanzania

A basin team wants to identify fields where irrigation timing may be inconsistent. A repeat-observation workflow can highlight differences in crop vigor and surface-water conditions across irrigation blocks, giving the team a practical agenda for canal and field checks.

The decision output is a conversation starter for water managers: which blocks require a site visit, a gate inspection, or farmer support? It is not a direct measurement of delivered water unless calibrated with flow and field data.

- Map irrigation blocks and canals as separate operational layers.
- Compare signals within the same crop calendar and account for acquisition gaps.
- Validate suspected under- or over-irrigation with farmer logs, gate records, or flow measurements.
- Use the findings to target maintenance and advisory resources.

Suggested pilot measure

Track the share of flagged locations that receive a documented field follow-up, the time from signal to visit, and whether the observation changed an operational decision.

Important note

Illustrative scenarios are provided for planning and training. They do not represent a guarantee of crop yield, disease detection, or irrigation measurement accuracy.