

The Returns on Investment (ROI) for Select CGIAR Innovations



Standing
Panel on
Impact
Assessment

November, 2025

Index-Based Livestock Insurance
Kenya and Ethiopia

Axial Flow Pumps
Bangladesh

Flood-Tolerant Rice Varieties
Bangladesh

Drought-Tolerant Maize
Ethiopia

For every \$1,
median* ROI =

\$7.1

\$42.5

\$1.5

\$7.6

Key Findings:

- To calculate ROI of CGIAR innovations, they must be both **'ROI-Appropriate'** and **'ROI-Feasible'** (i.e., reliable cost, reach and impact data available)
- This study finds that 4 CGIAR 'successes' likely generated positive returns, even under conservative assumptions
- Three of the four qualify as 'Big Wins', which are rare in Agricultural Research for Development (AR4D) but justify investment in the portfolio as a whole

Background

Stakeholders and funders increasingly demand evidence of CGIAR's economic returns. Building on SPIA's mandate to document the reach and impact of CGIAR innovations, the System Council requested SPIA to conduct a ROI analysis for select "emerging successes", i.e., innovations with strong evidence of reach and causal effects. This policy brief presents results for four such innovations which lend themselves to ROI estimation relatively easily: they are "ROI-appropriate", and comprehensive cost data, rigorous impact evidence, and documented reach/adoption numbers make ROI estimation feasible. They demonstrate an approach to estimate ROI when the right data exists but also highlight key challenges.

Methods

SPIA used a harmonized benefit-cost analysis (BCA) framework to estimate the ROI of the four CGIAR innovations. ROI is defined as the ratio of total monetized benefits generated by an innovation to the CGIAR costs for research and dissemination activities. It is computed as follows:

$$\text{ROI} = \frac{\text{Total Benefits}}{\text{CGIAR Costs}}$$

Reported ROI values therefore represent the realized economic return over the period covered by available data. To account for parameter uncertainty and to assess the robustness of estimated returns, we present results in the form of Monte Carlo-based distributions of the ROI for each case. Each simulation run involved 100,000 random draws over the distributions of the underlying parameters. In this way we hope to communicate the uncertainty inherent in such an exercise, that is amplified by the multiple assumptions needed to plug information gaps at different points. We also see the likelihood that the investment does better than break-even (i.e., $\text{ROI} > 1$). This is a more realistic depiction of potential outcomes than a single deterministic ROI estimate.

Results**

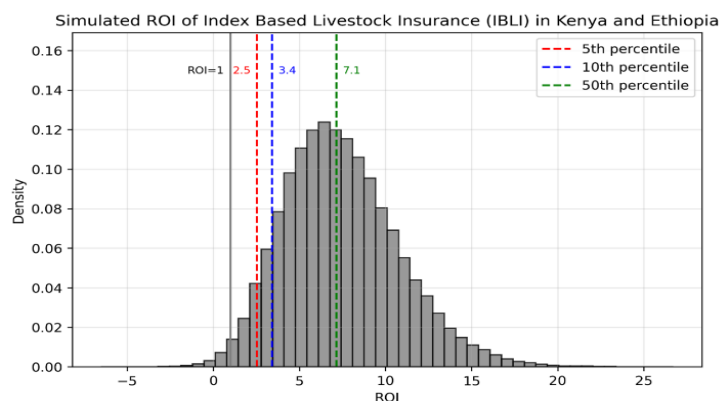
Below are the ROI results of the four innovations:

*Median of the ROI estimate distribution could be interpreted as an expected value (i.e., a 50% likelihood that the ROI is at least at least the given value). Decision-makers could also set/use the higher likelihood thresholds.

** All figures are converted to constant 2022 USD and exclude certain benefits

Index-Based Livestock Insurance (IBLI) – Kenya, Ethiopia

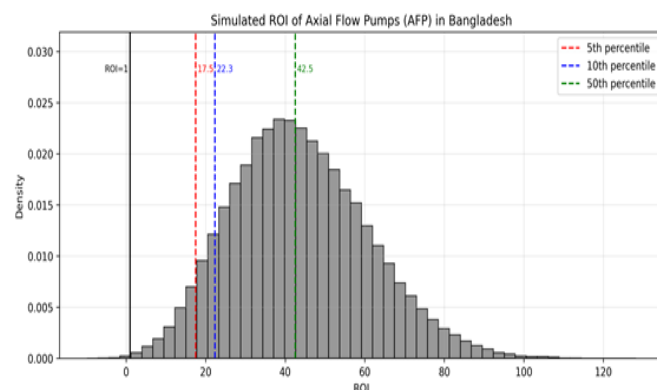
IBLI uses satellite-derived vegetation indices (NDVI) to trigger payouts to households when forage scarcity in their area reaches a critical threshold. This helps protect livestock assets and stabilized incomes and consumption.



This study monetizes the value of two measurable benefits: short-term income gains during droughts of the order of KES 61,000–75,000, and the 7.4 additional years of school attainment of children of IBLI-holding households. It is estimated that 43,931 policies were sold between 2010–2020. These are compared to CGIAR's research and dissemination costs of \$17.68 million.

Axial Flow Pumps (AFPs) – Bangladesh

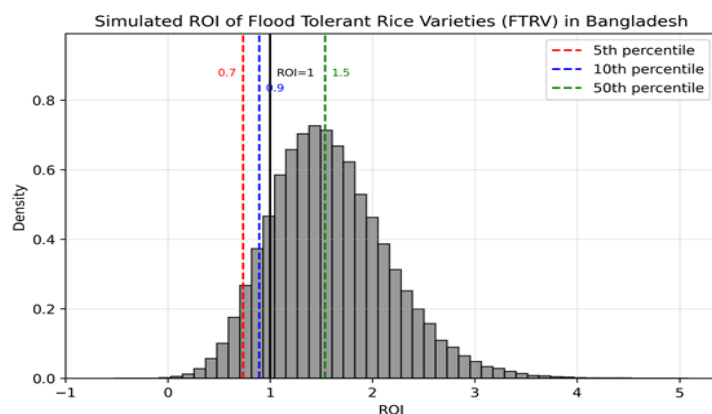
AFPs are a mechanical irrigation technology for shallow water conditions. Compared to traditional centrifugal pumps, they offer high-efficiency water delivery while lowering fuel use and operating costs.



It is estimated that 1.6 million Bangladeshi households used AFPs to irrigate their fields as of 2023. The ROI calculation is based on the estimated fuel cost savings (net of AFP purchase/rental costs) of \$10–37 per hectare per season for adopting farmers. These benefits are compared with the \$4.87 million cost involved in public R&D, testing and demonstration between 2013 and 2018.

Flood-Tolerant Rice Varieties (FTRV) – Bangladesh

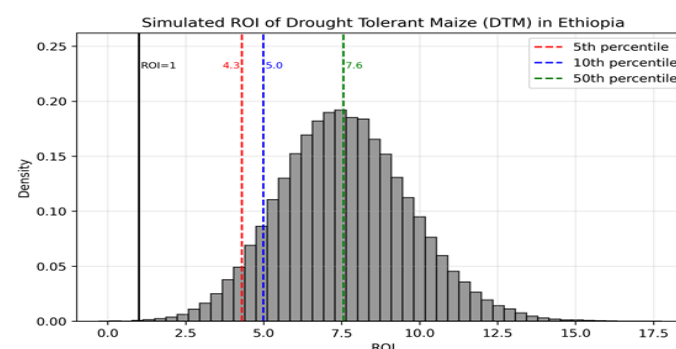
FTRVs, notably those carrying the Sub1 gene, enable rice plants to survive complete submergence for up to two weeks, protecting yields in flood-prone ecosystems.



By combining remote sensing data on floods in Bangladesh with data on household-level adoption of FTRVs, it is estimated that between 49,000 and 102,000 hectares of land under rice benefited from this yield protection between 2002 and 2021. The yield protection during moderate "Goldilocks" floods and adoption is compared against the \$5.7 million spent on research and dissemination of FTRVs in Bangladesh.

Drought-Tolerant Maize (DTM) – Kenya

DTM enhances yield stability under rainfall variability. They provide small differences in yields in good seasons, but help avoid loss during mid-season droughts, to the tune of 46–180 kg/ha of maize output protected.



It is estimated that by 2023, 2.6 million households (representing 14% of maize area) were growing DT maize, up from 0.01% of maize area in 2009. The benefits are calculated for adopting households over the period 2009–2021 and compared with the overall costs of \$21 million on research and dissemination.

Lessons Learnt

- **Portfolio thinking needed:** The "successes" justify broader portfolio-level investments, precisely because we do not know ex-ante which innovations will succeed
- **ROI estimates involve assumptions:** The distributions reflect uncertainty and data limitations about adoption, costs, and benefit pathways of CGIAR innovations
- **ROIs are necessary but insufficient:** ROIs can only inform, not dictate, investment decisions within/across the CGIAR portfolio