A Digital Lifeline for Farmers

How Cropin and ADPC Built Climate Resilience in South Asia

Location: Sri Lanka (Anuradhapura, Vavuniya) & Bangladesh (Khulna, Rangpur, Dinajpur)

Crops: Rice

Product Used: Cropin deployed its comprehensive digital toolkit, Cropin Grow (SmartFarm Plus), for farm management and

Cropin Intelligence's hypertuned plot-specific advisories for data-driven decision making.

Agency: ADPC (iCARE for South Asia, funded by The World Bank)

Introduction

Smallholder farmers of the low- and middle-income nations produce about 70% of the food – a powerful truth! Yet these millions of growers in the Global South are now facing a devastating reality - CLIMATE CHANGE. This isn't a distant threat; it's here to stay, and extreme weather events are taking a severe toll on agriculture. In nations like Bangladesh and Sri Lanka, agriculture is the lifeblood of the economy, employing nearly every second worker in Bangladesh and contributing 7% to Sri Lanka's GDP. The problem? Both countries depend heavily on rice, a single grain that is tragically vulnerable to climate impacts.

To provide a firsthand understanding of the devastation - in 2022, floods ravaged Bangladesh, destroying enough rice to feed 10 million people for a month. This isn't an isolated event. Droughts, floods, and rising salinity are continually disrupting livelihoods. But these farmers often lack the resources needed to get ahead, whether it's access to finance, quality seeds, or—most critically—data that could save their crops.

The question was: How could a global leader in climate resilience step in to protect these vital supply chains and empower the most vulnerable?

The Challenge

Battling the Elements on a Tiny Plot

The entire livelihood of a smallholder farmer in South Asian regions like Bangladesh or Sri Lanka rests on a tiny plot, often less than a single hectare. Their life is a daily gamble against extreme weather and economic instability. In fact, these already-struggling communities are collectively spending hundreds of billions of dollars annually just trying to cope with climate change—an unsustainable burden.

The regional challenges are complex and immediate, making resilient farming nearly impossible.

In Bangladesh

- Excessive and sporadic rain continually batters crops and therefore farmer's productivity.
- Resistance in onboarding farmers, their hesitation was rooted in a history of deceit as past data collection led to exploitation.

In Sri Lanka

- Farmers have been hit by political volatility, imposition of curfews and fertilizer ban.
- They were initially wary of the new digital interventions, fearing it would lead to empty promises.

The Goal was clear

Digitize farms and boost yields using predictive intelligence.

Recognizing this urgent crisis, the Asian Disaster Preparedness Center (ADPC), a climate resilience champion backed by the World Bank's iCARE Innovations Fund, stepped in. ADPC realized that addressing climate risks required more than just funding; it needed innovative, data-driven solutions capable of operating at scale across diverse geographies and farming practices.

Under the iCARE program, ADPC's mission was clear: to help vulnerable farmers in Bangladesh and Sri Lanka adopt climate-resilient practices and mitigate risk.

Cropin was among the innovators selected through this program and awarded a pilot opportunity in 2021. The pilot delivered strong results, demonstrating the tangible value of climate-smart advisories. Based on this proven performance, the initiative was successfully expanded in 2023 to cover a wider geography and a significantly larger farmer population.

The Solution - Bridging the Gap

A Personal Weatherman and Crop Whisperer

Building Trust : Both in Bangladesh and Sri Lanka, farmers were reluctant to participate in the program, despite it being free for them. This is attributed to constant scams and identity theft. Cropin partnered with Algorithmics, the regional partner, to identify local field officers who could visit farms and onboard farmers. Farmers gained trust and started to register and soon saw the value.

Field Digitization : The initial task was foundational; identify lead farmers at the community level to act as vital hubs for information. Cropin empowered field teams to capture crucial ground-level data, from the financial status of the farmer and number of dependent family members to the specific pest and disease challenges faced over the last two years at a plot level. This allowed the system to truly understand the farmer's precise situation.

Precision at Scale : This ground truth was the key to unlocking predictive power. Leveraging proprietary AI/ML models, Cropin overlaid key indexes from satellite data (like NDVI), hyperlocal weather data, and Cropin's extensive crop knowledge graph to derive deep agri-intelligence.

Preventing Loss with Curated Advisories

This detailed approach allowed us to

- **Crop Vigor & Health Monitoring :** Track overall plant strength and detect early signs of stress using vegetation health indicators, ensuring quick intervention before issues escalate.
- **Precision Water Management :** Identify moisture-deficient fields to support optimized irrigation and conserve resources.
- **Nutrient Optimization :** Highlight nutrient-deficient zones to guide corrective input planning, ensuring plants get exactly what they need, exactly when they need it.
- **Proactive Yield Estimation :** Get early, reliable predictions of expected production to support better planning and understand pricing trends.
- **Accurate Harvest Timing** : Predict the most likely harvesting periods based on crop development patterns, ensuring optimal timing for maximum quality and price.
- **Growth Stage Tracking :** Instantly know how crops are progressing across their key phenological stages, providing a real-time digital map of crop development.
- **Fine-tune the Disease Early Warning System (DEWS) :** An AI model that accurately predicts the probability of disease or pest infestation.
- **Activate Proactive Weather Alerts :** Farmers received timely SMS advisories, for instance, on heavy rain forecasts, giving them a crucial window to salvage their crops. These short-term weather advisories and alerts were critical operational decision-making in the field.

The platform delivered tailored, timely advisories directly to the farmers. These were crop-variety-specific PoP recommendations and personalized climate-smart guidance. Costs for communicating with farmers were optimized by partnering with local telecommunication players.

In Bangladesh (Dinajpur, Rangpur, and Khulna), Cropin's farm management solution meticulously digitized every enrolled farm, gathering data from geo-coordinates to crop details. Advisories were shared with these farmers.

In Sri Lanka (Anuradhapura and Vavuniya), the key was ensuring reach. We partnered directly with Vivasaayi Sangam (Farmer Community Forums) and customized the dissemination:

- **Tech-Savvy** : Access was provided via Cropin's Farmer Engagement and Communication solution on **smartphones**
- **Feature Phone Users** : Timely advisories were sent via **SMS**

Cropin delivered these SMSes in customized languages, **Sinhala and Tamil in Sri Lanka and Bangla in Bangladesh.**

Empowering Global Food Systems

This partnership proves the immense potential of predictive intelligence. By providing the right tools and support, Cropin and ADPC are not just transforming individual lives but paving the way for sustainable, resilient farming across South Asia, enabling even the most vulnerable communities to adapt and thrive.

From Knowledge to Action

In essence, Cropin acted as a farmer's **personal weatherman and crop whisperer, delivering vital alerts 7–12 days ahead of potential weather events and providing regular plant health recommendations.** This ensured no farmer was left behind in gaining advisories to mitigate identified risks. Following a successful pilot, this comprehensive approach made Cropin the natural choice to scale this essential digital lifeline across the region for the second and third phases of the project.

In Bangladesh, the transformation started with small thoughtful steps

- Personal connection bridged the gap between farmers and the project
- Transparency & patience showed genuine intent to support farmers
- The platform delivered value with personalized advisories

In Sri Lanka, Cropin Grow empowered farmers with

- Good Agricultural Practices (GAP) guidelines
- Early warnings for pests and diseases
- Real-time weather advisories
- Recommendations for optimized input usage

Cropin's Digital Toolkit in Action

Feature - Impact
Real-time Farm Monitoring - Digitized and geotagged farms for continuous data insights.
Disease Early Warning System (DEWS) - Predicts disease infestation probability based on weather to mitigate risks.
Personalized Advisories - SMS alerts optimize input resource use for every crop variety and growth stage.
Weather-Ready Forecasts - Alerts sent 7–12 days in advance for proactive planning.

The results were undeniable, proving conclusively that technology and remote sensing can dramatically improve livelihoods on the smallest of farms. The initial skepticism was replaced by enthusiasm, demonstrating that when a solution delivers tangible value, trust naturally follows.

- 8200+ Farmers Empowered
- 8300+ Plots
- 30% Increase in Crop Yields
- 23% Reduction in Crop Loss
- 90% Adoption Rate
- 92% Farmer Satisfaction Rate
- 600,000+ SMS-Based Farming Advisories Sent

Adnan Alam, Regional MEAL Specialist at ADPC, said, "By engaging digital innovators such as Cropin with a strong presence on the ground and the tools and technology to reach communities at the grassroots level, we’re able to realize our mission more effectively.”

Resilience Takes Root in Bangladesh

The initial skepticism was quickly replaced by farmer enthusiasm as the platform delivered tangible, real-world value. In Bangladesh, farmers gained the tools to mitigate significant risks. Combining precise advisories with the early warning system empowered them to:

- **Mitigate Harvest Risks**: Proactively deal with sporadic rains during harvests.
- **Protect Produce Post-Harvest**: Reduce losses from unforeseen floods with essential storage advisories.

This demonstrable ground-level impact earned the project recognition from multiple stakeholders, validating the solution's real value.

Profitability Rises in Sri Lanka

In Sri Lanka, the focus was on efficiency and profit:

- **Optimized Costs**: Cropin's data-driven recommendations guided farmers to cut input costs by over 50%, boosting profitability and sustainability.
- **Community Resilience**: Farmers were empowered to make informed, adaptive decisions to mitigate climate challenges and ensure viable livelihoods.

A local dairy farmer summarized the change: *"Earlier, I relied on the radio or TV for weather updates... Now, an SMS helps me plan my day, avoid losses, and focus on both my farm and dairy business effectively."*

Cropin®

Founded in 2010, Cropin is the world's most advanced AI Platform for Food and Agriculture. Cropin Cloud, the world's first industry cloud for agriculture, has computed 10% of the world's cultivable lands. Implemented by over 250+ enterprises, Cropin empowers stakeholders to make informed decisions that enhance farming efficiency, productivity, and sustainability. Our teams are spread across India, the United States of America, Italy, the Netherlands, and Brazil. We have digitized 30 million acres of farmland and positively impacted over 7 million farmers worldwide. Our crop knowledge graph, spanning 400+ crops and 10,000+ varieties in 103 countries, powers the Cropin Cloud. We are at the forefront of uniting agribusinesses, development agencies, international organizations, and governments to leverage Agtech systems to transform global food systems and attain climate goals. Cropin is backed by Google, Bill & Melinda Gates Foundation, ABC Impact, and Chiratae Ventures, among other notable investors.