



Strengthening Food Security through Fertilizer Innovation and Localized Supply Chains



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Food security begins long before food reaches the market; it begins with a farmer's ability to produce the next harvest. When conflict, volatile energy markets, and geopolitical shocks disrupt international supply routes, the consequences ripple across entire economies. Farmers risk missing narrow planting windows, harvests decline, input costs spike, and food insecurity escalates. One of the most important opportunities in global agriculture today is not only helping farmers access fertilizer but helping countries build the capacity to produce fertilizers locally from the resources they already possess. By advancing decentralized fertilizer production systems, affected regions can reduce dependence on fragile global supply chains, improve resilience to geopolitical disruptions, and create more stable access to crop nutrients for their farmers. Through its Strategy 2026-2035 – **Fuel the Farmer | Feed the Soil | Foster the Future** – IFDC bridges immediate crisis response with the long-term imperatives of scaling fertilizer innovation, localizing production, restoring soil health, and building sovereign, shock-resilient agricultural systems.

Fuel the Farmer: Protecting the Next Harvest

Farmers are often among the first to feel the effects of an input crisis. Protecting the next harvest means identifying risks early, helping decision-makers act, and ensuring farmers can access the inputs and services they need.

- **Turning Early Information into Action:** At the beginning of the 2026 fertilizer crisis, IFDC provided evidence-based briefings to the African Union Commission, the Economic Community of West African States (ECOWAS), government officials in Africa and Asia, and development and financing partners. The briefings identified countries and cropping seasons at risk, explained the implications of rising prices and disrupted trade, and highlighted potential supply gaps, sourcing options, and areas requiring coordinated support.
- **Helping Countries Identify Supply Gaps:** Through the Soil Values program, IFDC supported Burkina Faso, Mali, and Niger in assessing available fertilizer stocks, estimating potential supply gaps, and identifying options to meet their requirements ahead of the cropping season.



- **Keeping Farmers Producing during Conflict:** Through Sustain Sudan and its partners, IFDC helped maintain access to agricultural inputs despite severe conflict and market disruption. The initiative facilitated the delivery of approximately 48,500 metric tons of fertilizer and contributed to agricultural production reported at more than 700,000 metric tons of potatoes and wheat combined, demonstrating the importance of restoring input access during a crisis.



- **Supporting Responsive Policies:** In Côte d'Ivoire, IFDC provided market evidence to support dialogue between the private sector and government on the implications of the fertilizer value-added tax (VAT) introduced in January 2026. The tax was subsequently suspended, easing potential pressure on fertilizer affordability and access.

Feed the Soil: Restoring Soil Health and Improving Nutrient Use Efficiency

In addition to accessible fertilizers, farmers also need healthy soils, appropriate solutions and services, and practical knowledge to use available resources efficiently. IFDC works with farmers and communities to restore soil productivity, strengthen resilience, and support more sustainable production.

- **Restoring Soils and Productive Land:** Through Soil Values, Transform Soil Fertility Management in Ethiopia (TRANSFORM), and other programs, IFDC supports soil restoration, integrated soil fertility management, composting, organic nutrient use, erosion control, and improved land management practices. By rebuilding the productive capacity of soils and landscapes, this work supports more stable production and helps farmers manage climate variability and input-market shocks.
- **Building Local Capacity and Enterprise:** Through Soil Values, IFDC supports young people and local enterprises in Burkina Faso, Mali, Niger, and northern Nigeria to produce organic fertilizers and seedlings. Training, equipment, and technical support help create livelihood opportunities while expanding access to locally produced soil health products.
- **Helping Farmers Use Nutrients More Efficiently:** IFDC promotes the integrated use of organic and mineral nutrient sources, alongside better soil information, locally appropriate fertilizer recommendations, and advisory services. The goal is not simply to apply more fertilizer, but to improve nutrient use efficiency, rebuild soil health, and support productive harvests.



- **Providing Bundled Solutions:** IFDC connects farmers with quality inputs, soil health knowledge, advisory services, finance, mechanization, and market opportunities. This approach recognizes that fertilizer delivers its greatest benefit when farmers can also access the complementary services needed to turn inputs into productive and profitable harvests.

Foster the Future: Localizing Solutions and Scaling Innovation

The fertilizer crisis has exposed the risks of relying on concentrated global supply chains. Greater resilience requires more diverse sources of supply, stronger regional markets, locally appropriate innovations, and continued research into solutions that can reach farmers at scale.

- **Accelerating Decentralized and Localized Production:** IFDC works with public and private stakeholders to scale decentralized fertilizer production, bulk blending, and regional trade infrastructure. Developing domestic and regional manufacturing capacity ranging from commercial organo-mineral blending plants to low-carbon production technologies delivers crucial economic and operational benefits:



- **Insulation from Foreign Exchange and Trade Shocks:** Domestic manufacturing curtails reliance on expensive hard currency imports, protects farm-gate prices from international shipping volatility, and stabilizes national trade balances.
- **Crop- and Soil-Specific Formulations:** Local blending plants formulate custom nutrient blends tailored directly to local soil deficiency profiles, replacing inefficient, generic commodities with high-efficiency inputs.

- **Shortened Lead Times:** Proximity to production ensures inputs reach agro-dealers and farm gates ahead of key planting windows, eliminating costly port backlogs and logistical delays.
- **Deploying Next-Generation Technological Innovations:** IFDC is uniquely positioned to support the transition to local manufacturing through concrete, field-tested innovations:
 - **Modular Green Ammonia Systems:** Catalyzing small- and medium-scale, renewable-powered nitrogen production eliminates reliance on imported fossil fuel.
 - **Phosphate Rock Activation:** IFDC helps develop innovative thermal and chemical processing methods to activate domestic, lower-grade phosphate rock reserves into plant-available nutrients.
 - **Circular Bioeconomy Models:** Agricultural byproducts and municipal organic waste are transformed into high-grade organo-mineral fertilizers and soil conditioners.
- **Advancing Fertilizer and Soil-Health Research:** IFDC conducts and supports applied research into locally appropriate fertilizer and soil health solutions, including organo-mineral formulations and approaches that optimize nutrient uptake and recycle organic resources. This work connects laboratory science directly with field validation, soil restoration, nutrient use efficiency, and farmer productivity.
- **Strengthening Regional Trade and Policy Environments:** IFDC supports market information systems, quality assurance standards, cross-border trade facilitation, and evidence-based policies. These interventions strengthen the enabling environment so local blenders and manufacturers can operate viably and complement international supply chains.
- **Taking Proven Solutions to Scale:** Innovation requires promising technologies and demands scientific evidence, regulatory alignment, quality verification, appropriate financing instruments, and private sector investment. IFDC bridges research, policy, and market mechanisms to help effective innovations reach farmers at commercial scale.
- **Advancing a Systems Approach through the 8R Framework:** IFDC embeds nutrient stewardship into a comprehensive regenerative systems model. By expanding standard 4R Nutrient Stewardship (Right Source, Right Rate, Right Time, Right Place) into the 8R Framework (by adding Recycle, Rebuild, Record, and Resilient), IFDC aligns localized production and regenerative agriculture to build long-term soil carbon, resource circularity, and systemic food resilience.



Food security depends fundamentally on whether farmers can access inputs, maintain productive soils, and continue producing when international markets and supply chains face disruption. By advancing decentralized production systems, unleashing technological innovation, and restoring soil health, IFDC partners with governments and private industry to protect the next harvest, strengthen rural economies, and build enduring food sovereignty.

