6. India's Fertilizer Crisis - Challenges and Way Forward

1. Context

1. India is facing a significant fertilizer challenge due to rising global prices and supply disruptions triggered by geopolitical tensions.
2. Particularly acute are tensions around the Strait of Hormuz amid the US-Israel versus Iran conflict disrupting trade routes.
3. The crisis threatens agricultural productivity and food security given fertilizers' critical role in crop production.

2. Nature of the Crisis

Sharp Increase in Prices

1. Urea prices have nearly doubled within a short period increasing from around $508 per tonne in February to approximately $935 per tonne in April.
2. This represents 84% price increase in just two months creating severe fiscal pressures on government subsidy budgets.
3. Input materials such as sulphur and ammonia have also witnessed steep price increases significantly raising fertilizer production costs.
4. Sulphur is essential raw material for phosphatic fertilizers while ammonia is critical input for urea production.
5. Global supply chain disruptions, energy price volatility, and geopolitical conflicts have contributed to input cost escalation.

High Import Dependence

1. India annually consumes 39-40 million tonnes (mt) of urea of which approximately 25% is imported.
2. This means India imports about 9-10 million tonnes of urea annually making it vulnerable to global market fluctuations.
3. Gulf countries account for nearly 40% of India's urea imports making supply chains highly vulnerable to regional instability.
4. Major suppliers include Saudi Arabia, Oman, UAE, and Qatar whose supplies can be disrupted by Strait of Hormuz tensions.
5. India also relies on West Asia for more than 60% of its liquefied natural gas (LNG) which is key input for domestic urea production.
6. LNG serves as feedstock in urea manufacturing plants through ammonia production making India doubly vulnerable to Gulf region disruptions.

Structural Imbalance in Fertilizer Use

1. Urea accounts for nearly 55% of India's total fertilizer consumption reflecting heavy imbalance in nutrient usage.
2. Ideal nutrient ratio should be closer to balanced NPK (Nitrogen-Phosphorus-Potassium) application for soil health.
3. Subsidy policies and price controls have encouraged excessive use of urea over other nutrients creating soil nutrient imbalances.
4. Farmers prefer urea due to its heavily subsidized price compared to phosphatic and potassic fertilizers.
5. This distorts agricultural practices leading to declining soil fertility and reduced crop productivity over time.

3. What Are Fertilizers?

Definition and Characteristics

1. Fertilizers are concentrated plant nutrients made from inorganic chemicals providing essential elements for plant growth.

2. Unlike organic manure derived from natural sources, fertilizers contain nutrients in higher concentrations.
3. They are applied in smaller quantities compared to organic manure due to higher nutrient density.
4. Major nutrients provided include nitrogen (N), phosphorus (P), potassium (K), and secondary nutrients like sulphur.

Role in Agriculture

1. Fertilizers enhance soil fertility enabling higher crop yields essential for feeding large populations.
2. They provide rapid nutrient availability compared to slow-release organic sources.
3. Critical for intensive agriculture where natural soil fertility is insufficient for high-productivity farming.

Subsidy Framework and Pricing Dynamics

Urea Subsidy Scheme

1. Under this scheme, urea is provided to farmers at a statutorily notified maximum retail price (MRP).
2. The MRP of 45 kg bag of urea is fixed at ₹242 per bag (exclusive of charges towards neem coating and applicable taxes).
3. However, the actual cost of producing and importing urea is around ₹3,000 for 45 kg bag.
4. This means government subsidizes approximately ₹2,758 per bag or over 90% of actual cost.
5. The massive subsidy burden creates significant fiscal stress especially when global prices surge.

Nutrient-Based Subsidy (NBS) Policy

1. This policy aims to promote balanced use of fertilizers by linking subsidies to nutrient content rather than final product.
2. Applied to phosphatic and potassic (P&K) fertilizers not covered under controlled pricing.
3. Under this scheme, government sets fixed subsidy amount per kilogram for each nutrient.
4. Nutrients covered include nitrogen (N), phosphorus (P), potash (K), and sulfur (S).
5. Companies are free to price fertilizers based on market dynamics while farmers receive nutrient-based subsidies.
6. This approach encourages companies to produce nutrient-rich formulations while giving pricing flexibility.

4. Government Initiatives in Fertilizer Sector

Nutrient Based Subsidy (NBS) Scheme

1. The Government introduced NBS scheme in 2010 for phosphatic and potassic fertilizers.
2. Under this scheme, fixed subsidy is provided for subsidized P and K fertilizers including di-ammonium phosphate (DAP).
3. Subsidy calculation based on nutrient content encourages balanced fertilizer formulations.
4. This helps reduce urea-centric subsidy distortions though urea itself remains under controlled pricing.

One Nation One Fertilizer Scheme

1. Introduced to bring uniformity in branding across all fertilizer manufacturers.
2. All fertilizers now sold under single brand name "Bharat" regardless of manufacturer.
3. Ensures transparency in fertilizer sector preventing brand-based price discrimination.
4. Promotes healthy competition based on quality rather than brand manipulation.

PM PRANAM Scheme

1. PM Programme for Restoration, Awareness Generation, Nourishment and Amelioration of Mother-Earth.
2. Launched to incentivize States and Union Territories to promote alternate fertilizers.
3. Encourages balanced use of chemical fertilizers preventing soil degradation.
4. States that reduce chemical fertilizer consumption receive financial incentives.
5. Promotes sustainable agricultural practices protecting long-term soil health.

5. Way Forward

Capacity Expansion

1. Speeding up commissioning of domestic urea plants under "Atmanirbhar Bharat" initiative will reduce import reliance.
2. Several new urea manufacturing units are under construction across the country.
3. Reviving closed urea plants with modern technology improves domestic production capacity.
4. Increasing self-sufficiency insulates India from global price volatility and geopolitical disruptions.

Sustainable Agricultural Practices

1. Wider adoption of nano-urea which provides same nutrients in much smaller quantities reducing application volumes.
2. Nano-urea developed by Indian Farmers Fertiliser Cooperative (IFFCO) is more efficient than conventional urea.
3. Promotion of bio-fertilizers containing beneficial microorganisms that fix atmospheric nitrogen or solubilize phosphorus.
4. Soil health cards providing soil-specific nutrient recommendations prevent excessive fertilizer application.
5. These practices can reduce chemical fertilizer intensity over time while maintaining crop productivity.

Improving Supply Chain Resilience

1. India should diversify import sources to reduce dependence on specific regions particularly Gulf countries.
2. Explore suppliers in Africa, Southeast Asia, and other regions reducing geopolitical risk concentration.
3. Strategic reserves of fertilizers should be developed to manage future supply disruptions.
4. Buffer stocks ensure continuous availability during international market disruptions or crisis situations.
5. Strengthening domestic storage and distribution infrastructure improves crisis response capability.

Encouraging Bio stimulants

1. Bio stimulants should be promoted as they enhance nutrient uptake efficiency from soil and applied fertilizers.
2. These products improve plant metabolism, root development, and stress tolerance.
3. They can reduce effective requirement of chemical fertilizers by improving nutrient use efficiency.
4. Examples include seaweed extracts, humic acids, amino acids, and beneficial microorganisms.
5. Regulatory framework should facilitate bio stimulant registration and market development.

Policy Reforms

1. Gradually rationalize urea subsidy to reduce fiscal burden while protecting farmer interests.
2. Move toward direct benefit transfer for fertilizer subsidies improving targeting and reducing leakages.
3. Promote balanced NPK application through differential subsidy structures.
4. Strengthen extension services educating farmers about optimal fertilizer use and alternatives.

Technology Integration

1. Precision agriculture using soil testing, GPS technology, and variable-rate application reduces fertilizer waste.
2. Digital platforms connecting farmers with soil health data and customized recommendations.
3. Research and development in slow-release and controlled-release fertilizers improving efficiency.

International Cooperation

1. Strengthen bilateral agreements with fertilizer-exporting countries ensuring stable supplies.
2. Participate in international forums addressing fertilizer security and sustainable agriculture.
3. Technology partnerships for developing efficient fertilizer production and application methods.

6. Challenges

Fiscal Constraints

1. Massive fertilizer subsidies strain government budgets especially when global prices spike.

2. Balancing subsidy rationalization with farmer welfare remains politically challenging.

Behavioral Change

1. Farmers accustomed to heavily subsidized urea resist switching to balanced fertilization.
2. Extension services need strengthening to change long-established agricultural practices.

Infrastructure Gaps

1. Inadequate storage and distribution infrastructure in remote areas.
2. Quality control mechanisms need enhancement preventing spurious fertilizer sales.

Global Uncertainty

1. Continuing geopolitical tensions and climate-related disruptions create supply unpredictability.
2. Energy price volatility affects production costs for fertilizer manufacturing.

7. Conclusion

India's fertilizer crisis stems from structural vulnerabilities including high import dependence, concentrated sourcing, and subsidy-driven consumption imbalances. Rising global prices and geopolitical disruptions expose these vulnerabilities threatening agricultural sustainability and food security. Way forward requires multi-pronged approach combining capacity expansion, sustainable alternatives, supply diversification, and policy reforms. Balancing immediate crisis management with long-term structural transformation is critical for fertilizer security. Success demands coordinated action across production enhancement, technology adoption, farmer education, and international cooperation ensuring resilient and sustainable fertilizer ecosystem.

Source - https -//indianexpress.com/article/explained/explained-economics/fertiliser-challenge-india-iran-war-10645383/