

Fertilizer Fault Lines

Supply Concentration, Price Shocks, and India's Strategic Vulnerability in Muriate of Potash Trade, 2010-2024

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India feeds 1.4 billion people on potassium it cannot mine, manufacture, or substitute. Every kilogram is imported. This is the story of what happens when the suppliers decide the price.

India feeds 1.4 billion people on soil it must perpetually borrow from abroad. Not labor. Not capital. Potassium - the third macronutrient of agriculture, the one element India cannot mine, manufacture, or substitute at scale. Every kilogram of Muriate of Potash (MOP) that reaches an Indian farm has been imported, priced in dollars, shipped through contested oceans, and bought from a handful of countries that hold most of the world's accessible reserves. This is not a procurement gap that can be addressed with market solutions. It is structural captivity - and fifteen years of trade data make that distinction impossible to ignore.

Four Numbers. One Problem.

Before the analysis, four figures frame everything:

Total MOP imported, 2010-2024	54.56 million MT
Total FOB cost, 2010-2024	USD 18.13 billion
Cheapest year (average price)	USD 0.232/kg - 2017
Most expensive year (average price)	USD 0.565/kg - 2022

That 143.5% price swing in five years is not market fluctuation. It is the fiscal signature of a geopolitical earthquake that India neither caused nor anticipated, transmitted directly into its food production budget through a supply chain it does not control.

The Market in India Cannot Leave

The global MOP market is a resource oligopoly. Canada, Russia, Belarus, and Jordan control most commercially accessible potash reserves. Germany and Israel contribute meaningful but smaller volumes. This concentration is not a policy failure - it is geology. Mines take decades to develop; supply does not respond to demand signals in the short run. When a supplier exists - through sanctions, war, or political disruption - buyers cannot simply source elsewhere. They pay what the remaining suppliers ask, or they go without.

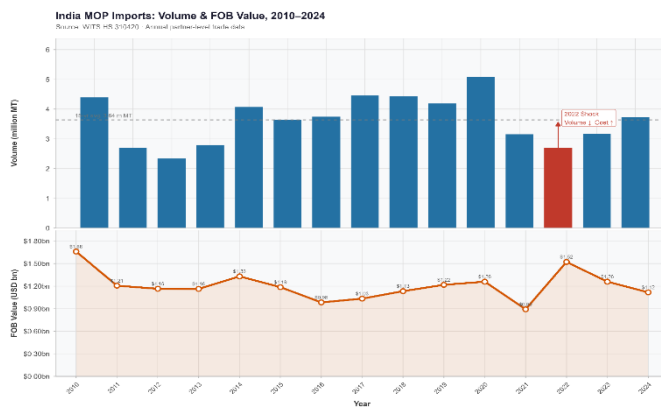
"India's negotiating position in MOP is structurally weak. Fifteen years of trade data confirm it has always been so."

For India, which must buy every year regardless of price, this market structure is not a periodic risk. It is the

permanent operating environment of its agricultural input economy.

The Inverse Shock of 2022

Annual import volumes fluctuated between 2.33 million MT in 2012 and 5.08 million MT in 2020 - a 2.2x range driven by price sensitivity, not agricultural demand. In years of lower prices, India bought more. In expensive years, it compressed imports. This means the supply chain functioned as a demand-rationing mechanism, directly contradicting the stated objectives of India's fertilizer subsidy policy, which exists precisely to insulate farmers from price signals.



The year 2022 makes the structural danger undeniable. India simultaneously paid its highest-ever MOP import bill - USD 1.52 billion - and received its lowest volume since 2012, just 2.69 million MT. Maximum cost. Minimum supply. In the same year. When two of India's three largest suppliers vanish from the import ledger simultaneously - with no buffer stock, no long-term contracts, no alternative supply chain in place - this inverse outcome is not an accident. It is a structural inevitability. Russia recorded zero exports to India. Belarus was severed by Western sanctions. Canada and Israel absorbed the volume at prices they had every incentive to maximize.

Three Phases that Explain Everything

The fifteen-year MOP price trajectory is not a single trend. It has three categorically different market environments, each with its own internal logic.

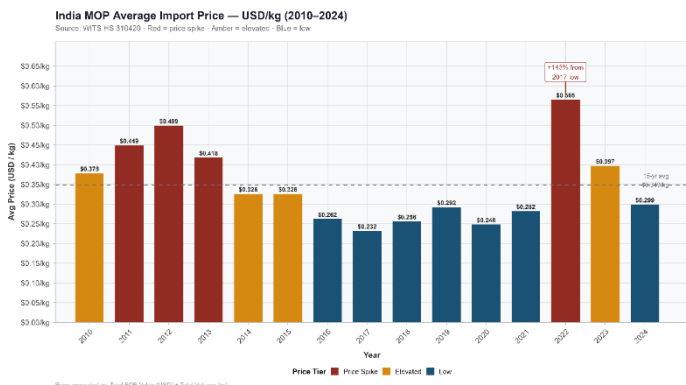
The Correction (2010-2017): Prices declined steadily from USD 0.378/kg to a fifteen-year low of USD 0.232/kg, as cartel fragmentation, new Canadian and

Russian mine openings, and global oversupply created the most competitive MOP pricing environment of the decade. For India, this was the golden period: affordable, stable, predictable. It was also the period during which the country had no structural protection for the moment the window closed.

The Creep (2018-2021): A quiet four-year recovery to USD 0.282/kg. Gradual enough to generate institutional complacency. Supply was tightening beneath the surface. Nothing in the price signal transmitted the warning with sufficient urgency. The amber light was blinking; India was not watching.

The Detonation (2022): One year. A 100% price increase to USD 0.565/kg. The simultaneous exit of Russia and Belarus removed suppliers that had historically accounted for over 40% of India's imports. Canada and Israel filled the gap on their own terms. By 2024, prices had corrected to USD 0.299/kg, near the fifteen-year average of USD 0.332/kg. The numbers are normalized. The structure behind them did not.

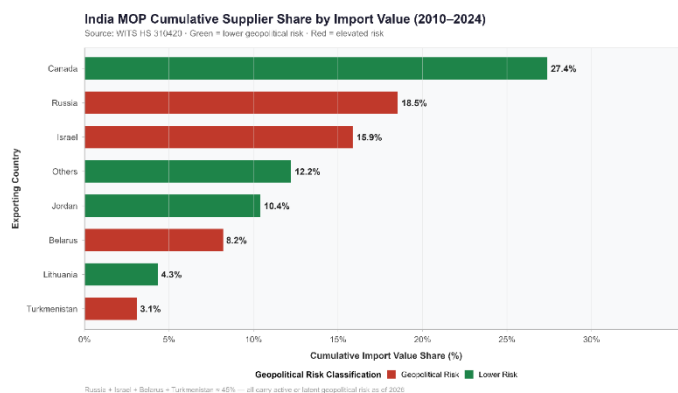
Who Supplies India - and What Their Profiles Signal



India sourced MOP from 26 countries over the study period. The distribution is ruthlessly concentrated: five suppliers - Canada, Russia, Israel, Jordan, and Belarus - account for approximately 80% of cumulative import value. The remaining 21 countries share the rest. Statistical diversity; operational negligibility.

Supplier	Cumulative Share	Risk Status (2026)
Canada	27.4%	Stable
Russia	18.5%	Active; sanctions-exposed
Israel	15.9%	Active conflict exposure
Jordan	10.4%	Stable
Belarus	8.2%	Sanctioned-zero imports
Turkmenistan	3.1%	Rapidly rising

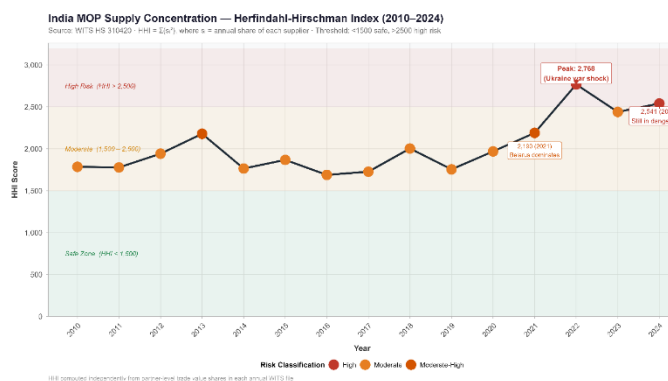
What the percentage shares cannot convey is the geopolitical weight behind each number. Belarus - worth USD 307.8 million to India in 2021, representing 34.5% of



that year's total import value - fell to zero by 2024. Russia recorded zero exports to India in 2022, then rebounded to 28.5% of import value by 2024. A supplier capable of disappearing from an import ledger in 12 months and returning to near dominance in 2 more is not a supply pillar. It is a concentration risk with a time fuse. Canada, the most reliable anchor at 34.8% of current imports, already exceeds the 30% single-supplier threshold that standard procurement frameworks classify as dangerous.

One Index That Settles the Debate

Supply concentration in commodity procurement can be measured as a single number. The Herfindahl-Hirschman Index (HHI) - used by competition regulators and strategic procurement analysts worldwide - is calculated by summing the squares of each supplier's percentage share of import value. A score below 1,500 is considered safe; 1,500 to 2,500 warrants monitoring; above 2,500 demands structural intervention. India's MOP supply concentration index has never touched the safe zone in fifteen years. Not once.



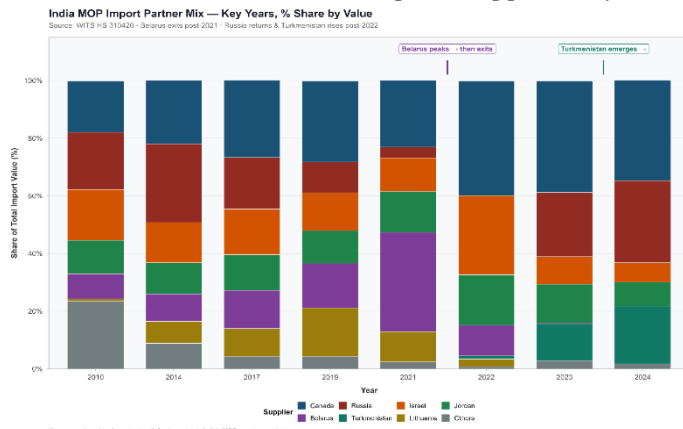
The index spent most of its history in the amber band. It crossed into red twice - peaking at 2,768 in 2022 and remaining there today at 2,541. Structurally improved since the crisis year. Still 541 points above the danger threshold.

"The 2022 crisis was not an aberration. It was the arithmetic consequence of fragility that had been accumulating for over a decade."

The index does not correct on its own. It responds to geopolitical events, not market cycles. Belarus dominated in 2021 - the index spiked. Russia and Belarus both exited in 2022 - the index peaked. Russia returned in 2023-24 - index dipped slightly, stayed red. India's supply concentration is not self-correcting. Left to market forces alone, it will remain elevated until the next shock converts the quiet amber warning into another 2022.

Three Ruptures, One Strategic Window

The composition of India's MOP imports in key years tells three stories at once - one of permanent loss, one of volatile return, and one of unexpected opportunity.



Belarus is gone, and the loss is structural. Its exit - driven by Western sanctions on Belaruskali following the 2021 political crisis - removed roughly 12 million MT per year of globally accessible potash capacity. India's exposure was immediate: a supplier worth USD 307.8 million in 2021 fell to zero. Canada absorbed the volume at peak-cycle prices. There is no realistic diplomatic pathway back to pre-2021 Belarus supply under current conditions.

Russia disappeared and returned, which is its own kind of risk. Zero exports to India in 2022. Second-largest supplier at 28.5% by 2024. The deepening of bilateral trade behind this recovery reflects deliberate intent on both sides. It has also rebuilt a single-supplier concentration that has already demonstrated it can dissolve in twelve months. A supply pillar that can evaporate is not a pillar.

Turkmenistan is the strategic opening India did not plan for. The country appeared only briefly in India's MOP import records in 2021. By 2024, it will be the third-largest supplier. The Caspian-Iran-Indian Ocean routing through Bandar Abbas to Vizag bypasses the Red Sea, the Black Sea, and the Suez Canal simultaneously - the three most disrupted maritime corridors of 2022-26. At an implied price near USD 0.28/kg, Turkmenistan is also the cheapest

major supplier currently accessible to India. Lowest geopolitical routing risk. Most competitive current price. Fastest-growing volume. In a single new source. Today's three-pillar structure - Canada at 34.8%, Russia at 28.5%, Turkmenistan at 20.1% - is more deliberate than the emergency configuration of 2022. The HHI confirms it is structurally improved. It also confirms it is not yet structurally safe.

The Fault Line Has Not Closed

India has built strategic supply frameworks for petroleum, rare earths, semiconductors, and defense hardware. The institutional vocabulary for critical import security exists. What MOP requires is the same recognition - that a 100% import-dependent agricultural input, sourced from a geopolitically exposed oligopoly, routed through contested maritime chokepoints, with no strategic buffer and no long-term contracts, is not a procurement management challenge. It is food security vulnerability.

Formalizing the Turkmenistan relationship through a government-to-government supply agreement would convert a commercial opportunity into a strategic pillar before China, which is systematically locking down Central Asian potash access, forecloses the option. Establishing a formal HHI ceiling, publicly reported annually, would transform supply diversification from aspiration into an accountability metric. A strategic buffer of 500,000-600,000 MT across Vizag, Kandla, and Paradip would cost roughly USD 45-55 million per year at current prices - a fraction of the incremental subsidy cost of 2022 alone. And shifting from spot procurement to three-to-five-year offtake agreements with Canada and Jordan - India's two structurally stable anchor suppliers - would compress the concentration index, reduce fiscal volatility, and restore the supply predictability that the fertilizer subsidy program currently lacks entirely.

These are not new ideas. They are the standard tools of strategic commodity management applied to an input India still treats as a routine procurement line. The five datasets behind this article tell a single consistent story: India's MOP supply base has never been structurally safe, became acutely dangerous in 2022, and remains in the high-risk zone today. The fault line that produced the crisis has not closed. It has simply gone quietly. History - all fifteen years of it - says that it will not stay that way.

All data: WITS HS Code 310420, 2010-2024. HHI was independently computed from annual partner-level trade value shares. All prices FOB USD/kg.
