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Commodity Derivatives for Price Risk Management by FPOs in India: Evidence from NCDEX Futures & Options (Soybean, Turmeric, Guar-Seed)

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Abstract

Smallholder farmer producers in India face substantial income volatility due to price fluctuations in commodity markets. Commodity Derivatives Market provide these smallholder farmers with additional option of an alternate modern national market which has potential to secure and or better realization of farmers. Farmer Producer Organisations (FPOs), through aggregation and better potential of a formal market engagement, have the potential to use commodity derivatives (futures, options) on platforms such as NCDEX to hedge this risk. This paper investigates hedging behaviour for three commodities viz., soybean, turmeric, and guar-seed, and quantifies hedged volumes, examines experiences of FPOs obtained via primary interviews, and explores the enabling factors and constraints. Data sources include published statistics and case-studies, plus semi-structured interviews with FPOs who have implemented hedge trades. Key findings: futures are the dominant instrument to lock in price and manage downside risk; options are less used but effective where cost of premium is low or upside price potential is high. Among the three commodities, guar-seed shows the highest and most consistent hedging volumes; turmeric and soybean follow, with significant variation depending on region, quality grading, and timing of harvest. Operational enablers include aggregation, grading standards, access to warehousing and delivery centres, margin/finance availability, and institutional support and training. The major constraints are basis risk, premium & margin costs, regulatory uncertainty, and limited awareness. Recommendations include extensive capacity building, pilot programmes with subsidised premium for options, strengthening of quality of produce/aggregation, improved access to warehouse receipt financing, and stable regulatory policy.

Keywords: FPOs; Commodity Derivatives; Futures; Options; NCDEX; Price-Risk; Guar-seed; Soybean; Turmeric

Introduction

Agricultural price volatility exposes farmers to significant income risk. FPOs have emerged as collective entities that can use NCDEX derivatives for risk management. This section introduces the problem, objectives, and significance of this research. Post-harvest price volatility in agricultural markets is a persistent source of income risk for smallholders. The FPOs work on both input side as well as output side of aggregation. output aggregation model by FPOs potentially makes them ideal counterparties to use exchange traded commodity derivatives for price management. NCDEX, India's primary agricultural derivatives exchange, has actively run FPO engagement programmes, training, and handholding to connect FPOs with modern markets such as futures and

options markets. Data indicates hundreds of FPOs have participated in hedging and many commodities (including soybean, turmeric and guar seed) have been hedged using exchange instruments.

Research question: How do FPOs use NCDEX futures and options to manage price risk, what operational and market features determine hedging success, and what policy/intervention measures increase adoption and effectiveness?

Objectives

1. To quantify hedging activities by Indian FPOs for soybean, turmeric, and guar-seed on NCDEX (hedged volumes, number of FPOs).

2. To understand experiences, challenges and outcomes from FPOs' own perspectives (via interviews).
3. To identify factors enabling or constraining effective hedging, and draw policy and operational recommendations for scaling usage.

Literature Review

A number of studies discuss futures and options for risk management in agriculture globally and in India. This section reviews key academic and policy works and highlights research gaps related to FPO participation in derivatives.

Prior studies show futures markets offer price discovery and risk transfer benefits but face frictions (minimum lot size, quality standards, knowledge gaps, financing). Policy developments (introduction of options in goods, FPO awareness programs) and exchange initiatives have progressively lowered those frictions. Several exchange-sponsored case studies and independent assessments (PwC, ICRIER, academic working papers) document early success stories on the same.

Materials & Methods

Choice of three Commodities & Rationale

We select (i) Soybean, (ii) Turmeric, (iii) Guar-seed for in-depth discussion because: (a) they are actively traded on NCDEX; (b) they represent different market structures (oilseed, spice, cash/industrial crop) and hence different hedging needs; and (c) Availability of secondary data for these commodities.

Data Sources

The study uses both secondary and primary data sources. Secondary data include NCDEX monthly reports and case studies. Primary data include semi-structured interviews with FPOs who have carried out hedging on NCDEX.

Secondary Data: Data from exchanges on the products and contracts available in futures and options, their contract

specifications, FPO newsletters, NCDEX commodity performance notes, PwC/academic reports on price risk management, other published reports, and exchange statistics on volumes and commodities hedged.

Primary Data: The study also incorporated insights from semi-structured interviews conducted with selected FPOs who had directly engaged in hedging on NCDEX. These interviews, carried out telephonically and during exchange-facilitated workshops, provided first-hand perspectives on operational challenges (such as contract understanding, margin management, and warehouse logistics) and practical benefits (price protection, bargaining power, and access to finance). These qualitative inputs complement the secondary data and enrich the analysis with ground-level experiences and perceptions.

Method

1. Qualitative analysis of FPOs trading to analyze hedging volumes, instrument used, operational steps and outcomes.
2. Synthesis of NCDEX monthly statistics (commodity wise hedged volumes, number of FPOs) to show scope and trends.
3. Conceptual discussion on hedge strategies (short/futures; options) and financing/warehouse linkages.

Limitations: reliance on exchange-published case studies and newsletters (possible positive bias), and lack of farm-level transactional microdata for econometric hedge-efficiency estimation.

Results and Discussions

Analysis of NCDEX data indicates that guar-seed dominates in hedged volumes, followed by soybean and turmeric. FPOs cited reduced price uncertainty and better bargaining power as major benefits. Challenges include high margin requirements and regulatory uncertainty.

Quantitative Findings: Hedging Volumes & FPO Participation

Commodity	Total Hedged Volume by FPOs (NCDEX, 2017-25)	Total Hedged Volume by FPOs (NCDEX, 2024-25)	Total Number of FPO Trades	Notes on Trend/ Seasonal Variation
Guar-seed	248,721	149,105	457	Peaks around export demand and harvest season
Soybean	45,095	0	326	Post suspension from the SEBI, currently this contract is not available at the exchange
Turmeric	18,705	6,100	335	Lower volume due to stricter quality/grade requirements

The analysis of NCDEX data from 2016 to 2025 reveals a significant rise in Farmer Producer Organization (FPO) participation in commodity derivatives trading, particularly in *Guarseed*, *Soybean*, and *Turmeric*. As shown in Table X, Guarseed recorded the highest cumulative hedged volume of 248,721 MT through 457 trades, demonstrating the most rapid expansion with a Compound Annual Growth Rate (CAGR) of 163.6% over the period. This suggests that Guarseed emerged as a preferred commodity for FPO hedging, possibly due to its high liquidity and relatively stable market depth on NCDEX.

Soybean, traditionally one of India's key oilseed crops, also showed active hedging participation with 45,095 MT traded and 326 FPO deals, reflecting a CAGR of 41.9%. However, growth slowed in later years, due to suspension of the futures and options contracts by the regulator.

Turmeric, though a niche commodity, registered notable growth with 18,705 MT traded and 335 FPO transactions, representing a CAGR of 63.2%. This highlights the increasing awareness among spice-producing FPOs, regarding the role of futures and options in mitigating price uncertainty.

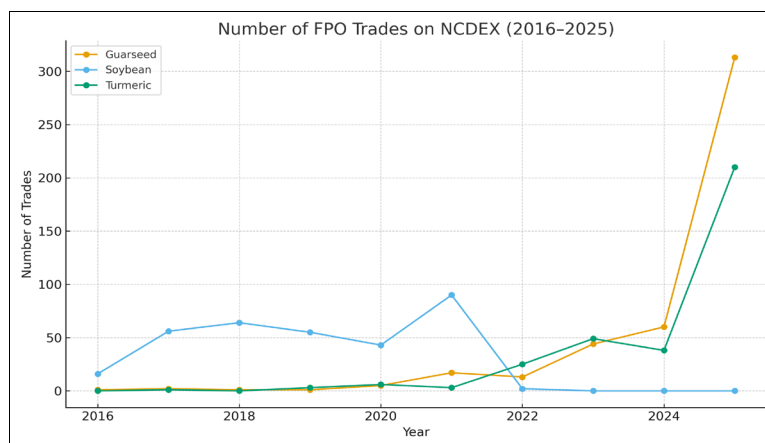


Fig 1: FPOs' Participation in Hedging Trades at NCDEX: Number of Trades

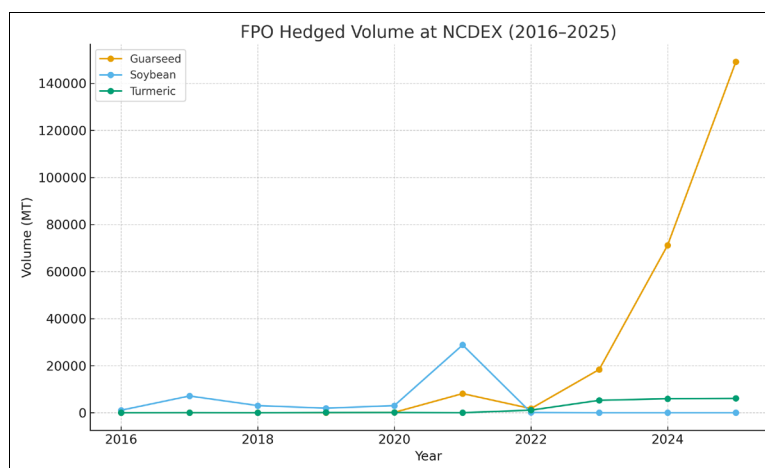


Fig 2: FPOs' Participation in Hedging Trades at NCDEX: Commodity-wise Volume (in MT)

Overall, the data underscores an expanding but uneven adoption of price risk management tools among FPOs, driven by commodity-specific market dynamics, policy environment, and institutional support including training and handholding initiatives.

Conclusion

Hedging through NCDEX commodity derivatives provides measurable benefits to FPOs, including price stability and access to finance. Policy support for margin financing, awareness programs, and infrastructure development is essential.

NCDEX-based derivatives (futures & options) already provide practical price-risk management tools to FPOs. The analysis of secondary and primary data demonstrates that when aggregation, quality control, warehousing and capacity building are combined, FPOs can effectively hedge price risk, access finance, and improve bargaining power. Scaling this model requires coordinated action across exchanges, financiers, extension agencies and policymakers. With structured interventions to lower entry frictions, especially financing, grading and targeted options pilots, exchange-based hedging can become a mainstream risk-management tool for India's smallholder farmers.

Acknowledgments

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