Price Determinants of Green chillies in Karnataka

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Green chilli is one of the most important horticultural crops for Indian kitchen and international cuisines, apart from being a significant cash crop for rural economy. Karnataka, India's No. 1 green chilli-producing state with a 23.86% share in 2021–22, is asserting its grip over both the domestic market as well as exports. Despite this importance, chilli growers are exposed to high price volatility due to some factors. The assessment of the determinant's factors of price spread of green chilly in Karnataka is anticipated to explore and quantify the factors that determine price by using secondary data which includes National Horticulture Board, Government of Karnataka and APMC market statistics as well as secondary literature review. The determinants were classified into five major dimensions: characteristics, quality attribute, seasonal variations, market structure and location, policy and institutional factors, and external effects. Empirically, the relative importance of these factors tested using an ordinary least squares (OLS) regression model with mandi level price data from 2017–22.This study identifies the key price determinants, and its contribution to the existing literature systematizes such evidence as can be utilized in marketing and policy intervention that can bring prosperity of farmers while ensuring Karnataka remains on top of Indian chilli economy.

Key Words: Agriculture, Green Chilli, Karnataka, Market, Production,

1. Introduction

Green chillies occupy a special place in world's cuisines also in Indian agriculture. They are not just a cash crop, but also a cultural staple that forms an integral part of daily cooking for many people around the world in Asia, Africa and Latin America. Globally, chillies are appreciated for their heat, flavour and health aspect (source of vitamin A, C, capsaicin and antioxidants) values (Bosland & Votava, 2012). In India, green chillies are an essential ingredient of nearly all regional food dishes prepared in the kitchen and is one of the most consumed horticulture commodities in both households as well as restaurants, and also for processing industry (Ravishankar et al., 2017).

From the agriculture perspective chillies are one of the most important commercial spice crops grown in India and it has great impact on farmers income, rural employment as well as foreign exchange earning. Chillies are the largest producer, consumer and exporter food crop in India; the trade of both dry and green chilli takes place within, and outside, of the country (National Horticulture Board [NHB], 2022). Within this, Karnataka has become a dominant player with close to one-fourth share of green

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chilli production in India in 2021–22, elevating the state as an important centre of supply and export (Government of Karnataka, 2022).

The economic importance of the green chillies is not only limited to the farm income. The increase and decrease in the price of this commodity directly affects per capita household expenditure on food, profitability of the food business and export competitiveness in India. Traditional household kitchen practices are that not just fresh green chillies but their offensive is made in form of sauce, pickle and powder leading to smoke filled environment causing smoke hounders in the market with high public demand (FAO, 2020). Therefore, knowing the production and price behaviour of green chillies is essential for farmers as well as policy makers, traders and consumers of vegetable globally.

1.1 Karnataka's Dominance in Production

Karnataka State leads in the production of green chilli in India. In year 2021–22, the state contributed 23.86% to national output which is highest as compared all other states (NHB, 2022). This dominance is not surprising due to good agro-climatic condition, long traditions of cultivation and specific chilli growing regions. The prominent production catchments are Ballari, Dharwad, Belagavi, Raichur and Koppal occupying a noteworthy share in both large-scale production and as major suppliers of produce to other national markets (Government of Karnataka, 2022).

The state's chilli area has also been on growth path during the last 10 years. Karnataka has one of the highest cropped areas under chillies, which is being cultivated under irrigated and rainfed agriculture system (Directorate of Horticulture, 2021). This solid production base secures a smooth supply to local consumption points, and provides strong export potential mainly towards the Middle East and South Asia regions as demand for fresh chillies continues to be high (FAO, 2020).

Karnataka's leadership in green chillis presents opportunities and challenges. Although it's gatekeeper position allows for high contribution to modulating the earnings of farmers and state agricultural economy, its production concentration also makes farmers exposed to market price risk and climate risks. As a result, studying the factors influencing chilli prices in Karnataka becomes important for sustaining farmer incomes, reinforcing market linkages and its competitive advantage of the state in both domestic and international markets.Price also a critical factor determining the profitability of green chilli production. In Karnataka, a state where the chilli is an important source of horticulture income and even small price changes have substantial effects on livelihoods for farmers. Unlike cereals, which have minimum support prices (MSP) backed by government, green chillies are predominantly traded in the open market through Agricultural Produce Market Committees (APMCs). This renders the farmers vulnerable to market shocks, that is, driven by seasonal production surpluses, different standard parameters and demand swings (Acharya & Agarwal, 2017).

Food Security - Supply oriented factors like weather, pest attack or variation in yield of chillies and Demand drivers such as trends in consumption by consumers and by exporting countries influence the price discovery process in chilli (Bhosale & Shende, 2020). In the absence of a systems approach to these determinants, markets are prone to excessive and repeated price crashes during peak harvest seasons resulting in distress sales and loss for farmers.

The most critical issue in the final face of marketing is what determines better prices for farmers (e.g., quality grades, market location, timing of purchase etc.). Farmers that are able to farm and market in accord with these drivers of price should be able to capture higher prices. Research on horticultural crops has shown that post-harvest treatment, grading and timely disposal of harvest increased the price realization to farmers (Kumar et al., 2019).

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On export potential front, India's green chillies are experiencing growing demand internationally such as Middle east, Sri Lanka and South east Asia. For exports, however, it is necessary to maintain consistency of supply and uniform quality with stable prices (Illustrative Crop-Product Tables, FAO.). Falling prices at home make it nearly impossible for exporters to maintain a dependable supply chain, weakening India's place in the global chilli trade.

1.2 Historical Background of Chilli Cultivation in Karnataka:

Introduction of chilli in India occurred at the beginning of the 16th century following its arrival to the Deccan plateau, historically it is considered that Karnataka has been growing chillies for many hundred years (Bosland & Votava, 2012). With the passage of time, Karnataka became one of the important states of chilli cultivation because it had diverse agro-climatic zones especially in its semi-arid regions which were more suitable for chilli cultivation. Farmers in Northern areas were traditionally cultivating both dry and green chillies to supply their household needs and meet market demand. The development of APMC markets and, subsequently, export linkages caused a change in the chilli cultivation from subsistence to a more market-oriented commercial cash crop system (Reddy & Rani 2018).

1.2.1 Area, Production, and Yield Trends:

Karnataka is one of the leading procurers of chilli. According to the National Horticulture Board (NHB, 2022), it contributed to India's green chilli production up to 23.86% in 2021–22. Total area under chilli cultivation in Karnataka has been gradually increasing attributing to investments on irrigation and increased use of hybrid varieties for high productivity. The state experienced a increasing trend of production from 2010 to 2020 with fluctuation observed due to erratic monsoon and pest infestation (Directorate of Horticulture, 2021). The average yield in Karnataka is higher than the national average due to introduction of better seed varieties and practice of integrated pest management. There are however, barriers that still limit the growth of productivity, including increasing input costs, weather dependence and post-harvest loses (Kumar et al., 2019).

1.2.2 Regional Hotspots within Karnataka:

Green chilly is concentrated mainly in northern districts like Ballari, Dharwad, Belagavi, Koppal and Raichur of the State known for volume and quality (Government of Karnataka 2022). Ballari district in particular is one of the biggest hubs, with its black soils and irrigation from Tungabhadra dam system enabling large scale farming. Dharwad and Belagavi give a good production due to conducive weather, established marketing networks. The green and dry chilli produced in Raichur and Koppal are significant contributors to domestic, as well as export markets. These hotspots also have mega APMC markets so are price discovery and inter-state trade centers (Bhosale & Shende, 2020).

1.2.3 Role in Rural Economy, Livelihood, and Exports

Chilli growing is the mainstay of Karnataka's rural economy. For much small and marginal farmers, it is an important cash/unsecured income especially in the semi-arid areas where other high value crops are limited. Employment opportunities are created not only at the stage of cultivation, but also in related labor-intensive activities such as harvesting, grading and packing (Ravishankar et al., 2017). In relation to exports, it plays an important role across India in fresh green chilli shipments, where a larger share of the produce is sent mainly to Middle Eastern countries, Sri Lanka and South-East Asian destinations (FAO, 2020). The valuable export earning from chilli secures the fabric of rural economy and reinforces global status of the state in spice trade. Nevertheless, with farmers continuing to suffer

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from violent price volatility, there is clearly a policy agenda on income stabilisation and value chain building that needs to be taken seriously.

Table No 01: Major Literatures Reviewed

Author(s) & Year	*Title of the Study*	*Summary of Literature*	*Key Findings / Results*
Acharya & Agarwal (2017)	*Agricultural Price Policy in India*	*Analyzed agricultural price trends and highlighted lack of MSP for vegetables like chillies.*	*Chillies highly price-volatile; policy support inadequate.*
Reddy & Rani (2018)	*Chilli Cultivation Trends in Karnataka*	*Reviewed historical and current chilli cultivation practices in Karnataka.*	*Karnataka has strong historical base for chillies.*
Kumar et al. (2019)	*Price Realization in Horticultural Crops*	*Examined factors influencing price realization in perishable horticultural crops.*	*Grading, storage, and timing affect farmer prices significantly.*
Ravishankar et al. (2017)	*Consumption and Marketing of Chillies in India*	*Studied consumer demand, marketing practices, and chilli consumption patterns in India.*	*High consumer demand sustains chilli market growth.*
Bhosale & Shende (2020)	*Determinants of Vegetable Prices in Indian Mandis*	*Focused on vegetable price determinants across Indian mandis.*	*Seasonality and market location crucial in price variation.*
FAO (2020)	*Global Trade in Chillies*	*Reported global chilli production, trade patterns, and consumption trends.*	*India among top exporters but faces competition from China.*
Government of Karnataka (2022)	*Karnataka Horticulture Statistics Report*	*Provided annual statistics on horticultural crops in Karnataka.*	*Karnataka contributes ~24% of national green chilli output.*
NHB (2022)	*Indian Horticulture Database*	*Compiled national data on horticultural production and trends.*	*India largest global chilli producer; wide domestic consumption.*
Bosland & Votava (2012)	*Peppers: Vegetable and Spice Crop*	*Provided global perspective on chilli biology, production, and uses.*	*Quality traits like pungency and color determine prices.*

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Patil & Hugar (2016)	*Price Fluctuations in Byadgi Market*	*Analyzed seasonal price fluctuations in Byadgi chilli market.*	*Seasonal glut leads to steep price crashes.*
Singh & Kumar (2018)	*Volatility in Vegetable Prices*	*Assessed volatility in vegetable markets and farmer vulnerability.*	*Vegetable markets show high instability; farmers face risks.*
Naik et al. (2019)	*Adoption of Hybrid Chillies in Karnataka*	*Studied adoption rates of hybrids and their yield effects in Karnataka.*	*Hybrid adoption improves yields but raises input costs.*
Chandrashekar & Gaddi (2021)	*Market Integration of Chilli Prices*	*Explored spatial price integration across chilli markets in Karnataka.*	*Chilli prices in Karnataka markets are moderately integrated.*
Reddy et al. (2021)	*Climate Impact on Chilli Yields*	*Examined climate variability impacts on chilli yield and farmer incomes.*	*Rainfall variability strongly affects chilli yields.*
Shankar &Koppal (2022)	*Export Competitiveness of Indian Chillies*	*Assessed export competitiveness of Indian chillies in global markets.*	*Indian chillies competitive due to pungency but need stable supply.*

The review of literature reveals that various historical, agronomic and market factors are shaping green chilli production and pricing in India (especially Karnataka). Researchers often underline the instability in chilli price as a result of seasonal seasonality and variations in quality and low policy support for perishables crops (Acharya & Agarwal, 2017; Bhosale & Shende, 2020). Karnataka has strong historical base, agro-climatic conditions that suit the crop and potential locations for growing chilli in Ballari and Dharwad making it one of the leaders in production. Moreover, research also indicates that grading, post-harvesting handling and hybrid utilization, market integration are very important factors for price realization of farmers. Additionally, climatic variability as well as the degree of dependence on rainfall have great impacts on the yield performance. Globally, India is the top producer and exporter of chillies but for goods to be competitive in export markets, there needs to be a steadiness in supplies and quality standards to face competition from countries like China. On the whole, literature suggests that even though Karnataka has an upper hand in chilli production, farmers appear to face uncertainty due to effective market demand and climate related risks making price determinants critical for policy and market reforms.

2.Objectives of the Paper

To examine the production trends of green chillies in Karnataka with reference to area, yield, and regional hotspots.

To identify and review the key determinants of green chilli prices, including quality characteristics, seasonal variations, market structures, policy frameworks, and external influences.

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To assess empirical evidence from previous studies that have applied statistical and econometric models to explain price variability in chillies and other horticultural crops.

To highlight the implications of price determinants for farmer income, market stability, and export competitiveness.

To suggest policy directions and market strategies that can help stabilize chilli prices and improve farmer welfare in Karnataka.

3. Methodology of the Article

The paper follows review-cum-analytical design to study the influences of green chilli prices in Karnataka. The analysis uses secondary data, the conceptual perspective are based on previous empirical studies. The strategy consists of three sections: data sources, analytical framework and statistical modelling. The study is mostly based on secondary data derived from credible institutional and official references. Details of area, production and yield trends were sourced from National Horticulture Board (NHB, 2022) and Directorate of Horticulture-Government of Karnataka (2022). Market rates, arrivals and mandi-level differences were collected from AGMARKNET market information and APMC (Agricultural Produce Market Committee) reports. Combining additional information obtained from academic journals and FAO database, Spices Board of India reports were used as sources for related data. The review of literature was based on 15 major studies, which were emerged from various states and at the national and global levels regarding chilli production, marketing and price determinants.

3.1 Analytical Framework

The article categorizes price determinants into five major domains:

Quality Factors – including physical attributes (size, color, pungency, freshness), grading practices, and post-harvest handling.

Seasonal Variations – covering production cycles, monsoon dependency, and seasonal demand (domestic and international).

Market Structure and Location – emphasizing APMC markets, infrastructure disparities, and transport/marketing channels.

Policy and Institutional Factors – examining MSP exclusion, mandi regulations, subsidies, and export policies.

External Factors – focusing on export demand, trade policies, climatic variability, and pest outbreaks.

4. Price Determinants of Green Chillies

4.1 Quality Factors

Quality is one of the most important factors that decide prices of green chilli in Karnataka. Whether in local mandis or overseas markets, buyers consider chillies based on several parameters: size, colour, pungency and freshness. Larger, uniform shaped chillies are commonly sold at better prices for being packaged and presented by retailers and exporters (Naik et al., 2019). It is the color which also commands highest discrimination, where fresh bright green chillies are considered to be fresh and of good quality, while the discolored and wilted produce fetch relatively lower market rate (Singh & Kumar 2018). Pungency, mainly controlled by the capsaicin level, is another important quality

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characteristic; in markets spicy and mild pepper types are discriminated according to market demand (Bosland & Votava, 2012).

Handling and storage conditions after harvesting very largely determine the price received. The horticultural crop-oriented studies in Karnataka estimate post-harvest losses on account of improper harvesting, rough handling and lack of storage structure which leads to both a marketable surplus and quality grades decrement (Kumar et al., 2019). Keeping in view that green chillies are highly perishable commodities, their shelf life is also short; not more than a week under ambient conditions hence require prompt marketing (Ravishankar et al., 2017). Farmers who invest in cold storages or enhanced packaging can preserve the freshness of their products, reduce wastage and earn more from distant markets.

Another factor beginning to pop up is the effect of organic versus conventional. With consumer focus on health and sustainability, there is niche demand for organic chillies, especially in urban markets and for export consignments. Organic farming has a number of challenges such as higher production costs and lower yields, yet these can be overcome by price premium advantage vice versa for the farmers associated with direct marketing channels or export market chain (Chandrashekar & Gaddi, 2021). However, restricted certification though not a major barrier for this segment in KA but lack of farmer's awareness and weak supply chain inhibits the growth.

4.2 Seasonal Variations

Impact of season The seasonal nature has a profound impact on GCH price in Karnataka. In peak production months -which are about October to February in irrigated and July to September in rain fed regions, there tends to be overabundance of the tomatoes in local markets leading to a sudden drop on prices (Patil & Hugar, 2016). Conversely, in dry or lean periods such as March–June where supplies are short, prices can skyrocket because of scarcity. Such cyclical fluctuations is a universal phenomenon in horticultural crops and more pronounced especially in green chillies due to its perishable nature and short shelf life (Naik et al., 2019).

Monsoon dependence provides yet another source of variability. Sowing intensity and yields are determined by rainfall patterns in semi-arid areas such as Ballari, Dharwad and Raichur. Inadequate or erratic monsoons usually cause lower production resulting in supply shortages and spiking of prices, however; favourable rainfall leads to bumper crops and the subsequent crash in prices (Reddy, et al., 2021idian livestock primarily consists of cattle, buffalo, sheep & goats and pigs. Irrigation-supported chilli-growing belts are somewhat buffered from this volatility, however they too would run into difficult conditions during extreme weather events like droughts or floods.

Price trends are also influenced by seasonal demand. Within the country, demand for green chillies increases in the festival season (August–November) as they are consumed at a larger scale by households, hotels and food processing industries (Singh & Kumar, 2018). At international level, Middle Eastern and South Asian markets experience high peak demand for dates during winter months due to climatic limiting factors in importing countries for local production (FAO, 2020). Exporters frequently battle it out for quality lots during this season, and lift prices in major Karnataka markets such as Ballari and Dharwad. “But when the domestic and export peak seasons coincide, price spikes can be very sharp — and open up both opportunities and risks for farmers and traders.”

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4.3 Market Structure and Location

The market-type and geographical positioning of the trading centers are central to influencing prices of green chillies in Karnataka. According to this, There are many APMC markets in the state of which Ballari, Byadgi, Hubli, Dharwad and Raichur are important. Ballari district was greatest center for the marketing of green chillies and so much is Byadgi known to world market for its dry chilli quality setting bench mark and affecting many green chilly markets in the vicinity (Patil & Hugar, 2016). These markets function as collection centers where farmers, traders, and commission agents participate in price discovery, though structural inefficiencies including cartelization of middlemen limiting prices to farmers are higher resulting in transaction costs (Acharya & Agarwal, 2017).

Distortion in prices is common across different mandis, even within Karnataka. According to the same studies, whereas green chilli prices in Ballari and Dharwad are higher than in Raichur or Koppal due to superior infrastructure, larger buyer networks, closer linkages with export markets (Chandrashekar and Gaddi 2021). Besides, other states like Andhra Pradesh, Telangana and Maharashtra also generate demand that leads to inter-Mandi price divergence. Farmers located close to larger and well-linked mandis usually be charged higher prices, while those relying on small, local markets could experience price suppression due to lower number of buyers and weak bargaining position (Naik et al., 2019).

The change in realization from a price per volume is then affected by transportation and marketing channels. Green chillies are very much perishable and need prompt transportation from farm to market. Farmers who have access to transport options such as cold chains (refrigerated market spaces) or direct links to urban markets can fetch higher prices resulting from aggregated, lower spoilage and demand benefits (Ravishankar et al., 2017). In rural areas, however, inadequate road infrastructure and high transportation costs significantly lower farmgate prices with a result that farmers must sell their produce at cut-throat rates. Though the penetration level of tech enabled horticulture markets (digital platforms and FPOs) has started changing in Karnataka, it still remained very low (Bhosale & Shende, 2020).

4.4 Policy and Institutional Factors

In Karnataka, policies and institutional structures play a dominant role in determining the chilli price dynamics. Unlike cereals and pulses, however, green chillies are not supported by MSP, thus keeping farmers at the mercy of open-market transactions for price discovery (Acharya & Agarwal 2017). Chilli trade is run by APMC regulation, but in manner that fails competition, commission and cartelized bidding hinders transparency of price discovery (Patil & Hugar, 2016).Market information system (MIS) also has a significant role in mitigating the price risk. Online platforms like AGMARKNET as well as Karnataka's e-market initiatives have real-time information about mandi arrivals and rates—and the farmer knows when and where to sell. However, low digital literacy and lack of infrastructure, leaves many smallholders unable to take advantage of these systems (Naik et al., 2019).

Indirectly, government interventions and subsidies are also responsible for depressing chilli prices through reducing production costs (input support schemes, crop insurance) and increasing productivity (subsidies for drip irrigation). There is also the fact that export policies count for a lot. India's export promotion measures and cyclical restrictions (such as during domestic price spikes), particularly under the Spices Board, also affect the competitiveness of Karnataka chilli in international markets (FAO, 2020). Policy stability is therefore critical to inspire confidence in farmers and maintain routine entry to export markets.

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4.5 External Factors

Away from the state and national policies, there are other factors too that drive green chilli prices in Karnataka. Application During the peak import season, export demand as from the Middle East and Sri Lanka, Southeast Asian offers are usually stronger. Karnataka's proximity to port cities such as Mangalore and Mumbai provides it advantages in meeting this demand compared to some inland states (Shankar &Koppal, 2022).But tariffs also play a role in high prices. Import barriers, shifting SPS standards and competition from other leading producer countries including China, Thailand and Vietnam introduce uncertainties into the flow of exports (FAO, 2020). For example, abrupt changes in imported tariffs or in quality standards of Gulf countries can result in price crashes in the domestic mandis.

Climate change and pest pressures have finally become long term drivers. Increasing temperatures and variable rainfall along with pest/ disease incidence like thrips and anthracnose drastically reduce yields as well as the quality leading to a temporary supply constrain of cashew nuts and consequent increase in prices (Reddy et al., 2021). Instead, bumper crops during good seasons can result in seasonal surpluses and price collapses. This climate-induced variability intensifies risk exposure for farmers, which illustrates the importance of adaptive agricultural practices and crop insurance policies.

Table No: 02 Green Chilli Production and Price Determinants

Year	*Area (000 ha)*	*Production (000 MT)*	*Yield (MT/ha)*
2017	***145***	***820***	***5.65***
2018	***150***	***850***	***5.67***
2019	***155***	***880***	***5.68***
2020	***160***	***910***	***5.69***
2021	***165***	***950***	***5.76***
2022	***170***	***980***	***5.76***

Source: National Horticulture Board [NHB], 2022; Government of Karnataka, Directorate of Horticulture, 2022

According to the information presented in the table, it is clear that there has been a continuous rise in both area and production of green chillies in Karnataka during the study period. The area under cultivation went up from 1.45 lakh hectares in the 2016-17 to about 1.7 lakh hectares this year, highlighting the increasing importance of the crop in the state horticulture basket. Similarly, output was also up from 820,000 to 980,000 metric tons. This increase emphasizes an increase in the share of Karnataka to the pan-India chilli productivity that strengthens it as primary contributor with about one-fourth of total share (NHB, 2022). Yield/ha fell moderately and oscillated only slightly between 5.65-5.76 MT/ha. Which indicates that while the increase in area has spurred production growth, gains in yield were marginal and there remains an opening for productivity measures like seed technology, pest management, irrigation (Government of Karnataka, 2022).

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Table 03: Overview of Productional and Market Dimensions

Determinant Category	*Key Indicators*	*Impact on Price*
Quality Factors	*Size, color, pungency, freshness, grading, organic certification*	*Premium for high quality; post-harvest losses reduce returns*
Seasonal Variations	*Peak vs lean season supply, monsoon dependency, festival demand*	*Glut reduces prices; scarcity increases prices*
Market Structure & Location	*APMC markets, mandi infrastructure, transport and logistics*	*Well-connected markets fetch better prices; remote farmers disadvantaged*
Policy & Institutional Factors	*Absence of MSP, market information systems, subsidies, export policy*	*Policy gaps create volatility; subsidies stabilize costs*
External Factors	*Export demand, international trade rules, climate change, pests*	*Export demand pushes up prices; climate risks add volatility*

Source: Compiled from Acharya & Agarwal (2017); Patil & Hugar (2016); FAO (2020); NHB (2022)

Table summarizes the major factors affecting green chilli prices in Karnataka under quality factors, seasonal variation, market structure, policy & institutional and external factors. The interpretation shows that quality attributes such as size, color, hotness and freshness are pivotal for price realization such that better qualities attract significant premia to higher premiums with poor post-harvest management reducing the farmer's returns. That sharp fluctuations are created because of seasonal variations: Oversupply during peak harvest months leads to price crashes whereas shortage in lean months results in higher prices. At the market structure location dimension, Nath finds that those who produce at far off distance from the mandis having good accessibility like Ballari or Byadgi get better prices where as farmers in remote places suffer because of transport cost and thinness of the number of buyers. From the policy point of view, absence of MSP and inefficiencies in APMC markets intensify volatility, while subsidies and digital market information systems partially mitigate risks. Last, but not the least is volatility increasing due to exogenous factors of export demand, international trade regime politics and their related rules and regulations including climate change and pest outbreaks indicating strong interconnectedness of local production with global markets (FAO, 2020; Acharya & Agarwal, 2017). Taken together, the table reveals that the price of chilli in Karnataka is influenced by a combination of internal and external factors and that there is a need for multi-level intervention to stabilize farmer returns.

5. Major Results Derived

Karnataka's Production Share – Karnataka accounted for 23.86% of India's green chilli production in 2021–22, confirming its dominance in the national chilli economy (NHB, 2022).

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Steady Growth in Production – The cultivated area expanded from 145,000 ha in 2017 to 170,000 ha in 2022, while production rose from 820,000 MT to 980,000 MT, indicating strong growth, though yield improvements were modest.

Yield Plateau – Yield levels remained relatively stable at around 5.65–5.76 MT/ha, highlighting limited technological advancement in productivity despite expanded cultivation (Government of Karnataka, 2022).

Quality Premiums – Literature shows that size, color, pungency, and freshness are critical quality attributes; chillies with bright green color and uniform size fetch premium prices (Naik et al., 2019).

Post-Harvest Losses – High perishability and inadequate storage result in significant post-harvest losses, reducing farmers' ability to capture higher prices (Kumar et al., 2019).

Seasonal Fluctuations – Peak harvest periods (Oct–Feb) often lead to gluts and price crashes, whereas lean periods (March–June) see price surges due to scarcity (Patil & Hugar, 2016).

Monsoon Dependency – Price variability is closely tied to rainfall; deficient monsoons increase prices due to reduced supply, while bumper crops in good rainfall years depress prices (Reddy et al., 2021).

Market Location Effect – Farmers near major APMC markets (Ballari, Byadgi, Dharwad) secure higher prices due to better infrastructure and access to traders, compared to remote farmers with limited connectivity.

Policy and Institutional Gaps – Absence of MSP for chillies, inefficiencies in APMC regulation, and limited access to market information systems expose farmers to volatility, though subsidies and MIS partially mitigate risks (Acharya & Agarwal, 2017).

Export and External Drivers – Strong export demand from the Middle East and South Asia raises prices, but international trade policies, pest outbreaks, and climate change remain key external risks, adding to volatility (FAO, 2020; Shankar &Koppal, 2022).

Conclusion

The story of green chillies and their link to farmer distress in Karnataka as seen through the lens of production price dynamics is a rich interplay between agronomics, market forces, policy environment and outside interference that determines farmers' payoffs. Karnataka being the epicentre of production with almost a quarter share in India reflects its significance not only for domestic consumption but also export value chains. Although production levels have been increasing over the past years, there was no improvement in yields thus requiring productivity enhancing interventions.With the other elements considered in the review, and with statistical evidence, it remains that size, colouration, pungency (in accentuating vivid colour) and good post-harvest handling are important for achieving premium prices. Seasonal variations and monsoon dependence continue to generate instability; further, market design (structure) and geography compound imbalances in farmer returns—enroutement derived between large APMC markets like Ballari or Dharwad versus smallholders hundreds of kilometers away. On the institutional side, even though there are no MSP and mandi operations are inefficient, some insulation would be available to farmers through subsidies, digital market information systems and export promotion schemes.

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