

AN INSIGHT INTO CHILLI CULTIVATION AND RISK MANAGEMENT PROCEDURES WITH SPECIAL REFERENCE TO KARNATAKA & ANDHRA PRADESH.

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Abstract

Is chilli cultivation favourable to farmers in Karnataka and Andhra Pradesh?

India the 'Land of spices' is the largest producer, consumer and exporter of spices with mammoth share in the world trade. India claims to have the spices production of 76 lakh MT, consumption of 73 lakh MT and export of 3.8 lakh MT of spices in the world with 57 lakh hectares of land under cultivation. Chilli popularly known as 'wonder spice' is a major spice crop as well as vegetable crop grown in many countries. It gained its popularity through more than 400 varieties available all over the world with different pungency, size, shape and colors and its usage. India is the largest producer and consumer of chilli, and rich in almost 50 varieties with contribution about 36% to the total world production. Chilli is an indispensable condiment and used in the daily diet of every Indian household in one or the other form. India is meeting approximately 25% of the world's chilli requirement and considered to be leader in chilli exporting followed by China with 24%. Indian chilli exports are mainly influenced by domestic demand and uneven production which is interrupted by erratic monsoon, drought, and yield factor. Chilli is cultivated in all the states and union territories of the India with Andhra Pradesh leading in both the land used for cultivation (20%) and production (55%). Orissa, Maharashtra, West Bengal, Karnataka, Rajasthan and Tamil Nadu are the other states following Andhra Pradesh in consumption of land for chilli. Andhra Pradesh, Karnataka, Maharashtra, Orissa, Rajasthan and Tamil Nadu, contribute around 86 per cent of the total area under chilli crop cultivation in the country and 90 per cent of the total Indian produce.

In spite of sustainable growth in chilli production, the lives of small and marginal chilli farmers are at stake. Two of every three farm suicides happening in the country are from states like Andhra Pradesh (A.P.), Maharashtra, Karnataka and Punjab due to high levels of indebtedness and helplessness at the situation where cash crops like chilli and cotton are cultivated. In 2012-13, 68 per cent of all the 13,754 farm suicides took place in Maharashtra, Andhra Pradesh, Karnataka and Madhya Pradesh owing to 70% of cash crops cultivation done in dry lands. According to government data & National Crime Records Bureau (NCRB), over 1,313 farmers committed suicide in Andhra Pradesh between 2005 and 2007. In Karnataka, the number stood at 1,003, since 2005-06 till August 2009. The agriculture sector of Karnataka and Andhra Pradesh states is characterized by lack of reliable and timely information. There is also a dearth of analysis on various vital aspects of the chilli production and marketing such as latest prices and trends at major national and international markets, seasonal price fluctuations, demand and supply pattern, overall production in the country, stocks available in cold storages, scientific forecasting, crop and weather information, its impact on agriculture and allied sectors, and hedging among the various varieties of chillies. With unfavorable deviations in chilli cultivation leading to reduced income, farmers are facing serious repercussions and risks. It is evident from many studies that risks faced by chilli growers are forcing them to these suicides and these are happening due to the lack of effective risk management measures and tools like derivative instruments.

This conceptual paper is an attempt to study the risks faced by the cotton growers in Andhra Pradesh Karnataka states and tries to answers the questions like what are the problems that are increasing the risk of chilli growers? Are there tools available to mitigate the risks of producing and marketing the produced? What is the role of government and cooperatives to safeguard the chilli growers' financial returns and lives

with special reference to Andhra Pradesh and Karnataka States? This paper also reviews the emergence of commodity derivatives, role of these risk management tools in hedging the risks (that) arise in cotton marketing.

Key Words: *Chilli Growers, National Crime Records Bureau (NCRB), Risk Management, Hedging, Commodity Derivatives.*

Introduction

India with its predominant rural base is considered as one of the world's oldest and largest agrarian country. Despite of LPG and modernization, still India in its day-today activities dependent on agricultural base. Every aspect of the economy, polity, and majority of its population are governed by the performance of the agricultural sector. Agriculture continuous to be the key sector of the Indian Economy, and contributes about 14.5 percent of the GDP. It is known through surveys that almost two-thirds of the population in India are connected with agriculture for their source of income. Almost 54% of employment is created through agriculture either directly or indirectly. The performance of agricultural sector during the past three decades has been with a growth rate of 2.59 percent per annum. India's population is growing faster than its ability to produce and it expected to reach 135 crores by 2025 AD with demand in food grains to the extent of 325 million tones. The phenomenal growth in population and rise in the standard of living as a result of economic changes, are exerting a greater pressure on the demand for agricultural commodities, which can be met only by increasing productivity as there is little scope for area expansion. As a result of the green revolution since the mid sixties, the total food grains production of the country has increased from a mere, 50.8 million tons during 1950-51 to 246.2 million tons in 2011-12 (Economic Survey 2011-12) consequently paralyzing agro-ecological stability. Further, rising costs of inputs have not been offset by commensurate increases in product prices. Therefore the economic importance of the green revolution has been somewhat marginalized. According to the records of the central agriculture ministry, government of India, the input costs have increased 2.35 times more than those of output prices. Therefore, agriculture sector has been suffering from adverse terms of trade. It is expected that India's future growth would rely on commodity based economy. High volatile prices, uncertainty in the production and demand patterns and lack of information on product demand and availability are the major issues for every stakeholder in the agricultural commodity supply chain. Apart from the production related issues, investment for the development of marketing, storage and cold storage infrastructure is touching the sky. India produces numerous crops ranging from cereal crops to medicinal crops for human consumption, for industries, and for animal feed etc. to any agricultural economy, cash crops are backbone and these crops are setting a strong base for Indian economy as well, where country's trade and commerce flourish domestically and internationally through them. Cash crops are generally grown for trading and form a major contribution to India's economy through large scale production for commercial purpose.

Chilli is one of the important vegetable spices grown all over the world except in colder parts. It is also known as red pepper or hot pepper and it constitutes an important well-known commercial crop used as a condiment, culinary supplement or as a vegetable. Chilli is mainly used as culinary supplement to add flavour, colour, vitamin and pungency. Chilli is virtually an indispensable item in the kitchen. Different varieties are grown for vegetables, spices, condiments, sauces and pickles. Chilli is one of the most valuable crops and grown throughout the country. India is the world leader in chilli production followed by China and Pakistan. with production of approximately 1.1 million tonnes annually. Chillies account for 20–30 % of India's total spice exports and are worth about €60–75 million. India also has the maximum area dedicated to the production of this crop. Chilli is a universal spice of India. It is cultivated in all the states and union territories of the country. The important states growing chilli are Andhra Pradesh, Orissa, Maharashtra, West

Bengal, Karnataka, Rajasthan and Tamil Nadu. As per the latest statistics, India produced 800,100 tonnes of dry chilli from an area of 930,000 hectares. Andhra Pradesh stands first in the list of chilli-producing states in India and also has the maximum acreage under chilli cultivation in the country. It alone commands 49 per cent of the chilli production in India, with a production of around 2.7 lakh tonnes of chillies. Karnataka follows Andhra Pradesh, contributing 14 per cent of the country's production. The major chilli producing states in India, namely, Andhra Pradesh, Karnataka, Maharashtra, Orissa, Rajasthan and Tamil Nadu, contribute around 86 per cent of the total area under chilli crop cultivation in the country and 90 per cent of the total Indian produce. Currently, chillies are used throughout the world as a spice and also in the making of beverages and medicines. India is the only country which is rich in many varieties with different quality factors. The varieties of chillies produced by India are Sannam, LC 334, Byadgi, Wonder Hot and Jwala. The market for chillies is affected by seasonal price fluctuations, overall production in the country, world demand, stocks available in cold storages and hedging among the various varieties of chillies. The major trading centres of chilli and chilli powder in India are Guntur (Andhra Pradesh), Warangal (Andhra Pradesh), Khammam (Andhra Pradesh), Hindpur (Andhra Pradesh), Raichur (Karnataka), Bellary (Karnataka), Unjha (Gujarat), Chennai, Kolkata, Mumbai, Delhi, Ahmedabad and Nagpur. Guntur is the largest chilli market in the world. Chilli is cultivated on different soil types and under different climatic conditions. Productivity will be more under deep, loamy, fertile soil with appropriate moisture content. It is cultivated throughout the year in India and two crops are produced a year each in wet and dry seasons with total production time of four months. As the leading producer of chilli crop in the world, India is also the largest exporter of chilli in the world. It contributes one-fourth of the total quantity of chilli exported in the world. Chilli exports can be improved by meeting quality demands of the international market. Indian chilli exports are facing problems of quality in terms of right pungency, yield and colour value as well as pesticide residues and aflatoxin. The increasing demand for processed chillies creates opportunities and challenges alike

Literature Review

1. In research article, '**Karnataka Farmers' Suicides Signs of Distress in Rural Economy**', Muzaffar Assadi, discusses about the farmer suicides in Karnataka and reasons for suicides. He says more than 20 peasants in the northern districts of Karnataka - Bidar, Raichur, Gulbarga, Dharwad have committed suicides over the last three months by consuming pesticides. The heavy losses they incurred due to crop failure and also mounting debts to the moneylenders seem to be the main reason.

2. Muzaffar Assadi (2006), in his research paper '**Agrarian crisis and Farmers' suicide in India: Dimension, Nature and Response of the state in Karnataka**', talked about farmers' suicide in different parts of India over the past one decade and he quoted that it was reflecting due to the deep rooted agrarian crisis and this crisis began in decade of 1980s when farmers' movement in different parts of India began demanding remunerative prices, writing off loans, etc and impact of globalization in recent years. It all began in Andhra Pradesh and later in Punjab, Maharashtra, Kerala and Karnataka. These were the farmers who can be called Market Oriented Autonomous Farmers, belonging to different social groups or backgrounds. Despite the best efforts of the government, the crisis was continuing.

3. In the thesis '**Marketing Of Dry Chillies In Karnataka-A Management Appraisal**', researcher Shivashankar.K (2007), stated that Agricultural marketing in India has not received as much attention as that in the field of agricultural production. For the farmer, disposal of his produce has become as important as the adoption of modern production technology in improving yield levels. The journey of each product from the farm to the ultimate consumer plays a crucial role in determining the price for the farmer. The evolution of new production technology cannot be sustained without the improvement in agricultural marketing system unless simultaneous efforts are effected. Incentives to expand production through high yielding varieties will not attract the farmers, unless marketing system improves only stability in income of farmers could be

brought about by stable yields, and more than this, the stable prices will induce the cultivators to expand production and increase their marketed surplus. researcher quotes that 'the instability in yield and prices more in the case of commercial crops, which has posed a serious problem in generating stability in income of the farmers'.

4. In the article '**Impact of Futures Trading on Indian Agricultural Commodity Market**',

Dr. Kedar nath Mukherjee (2011) discussed about the impact of commodity derivatives on commodity market and he said that besides the well-established fact towards the requirement of market based instrument, there is always been a doubt, as expressed by different bodies, on the usefulness and suitability of futures contract in developing the underlying agricultural commodity market, especially in agricultural based economy like India. He made an attempt to re-validate the impact of futures trading on agricultural commodity market in India. The daily price information in spot and futures markets, for a period of 7 years (2004 – 2010), for 9 major agricultural commodities, taken from different categories of Agri-products, were incorporated into various econometric models to test the concerned objective. The study had exhibited that even though the inflationary pressure on commodity, especially agricultural commodity, prices have gone up sharply after the introduction of commodity futures contracts, the destabilizing effect of the futures contract is casual in nature and tends to vary over a long period of time. The empirical findings significantly shows that comparative advantage of futures market in disseminating information, leading to a significant price discovery and risk management, that can again help to successfully develop the underlying commodity market in India.

5.S.B. Goudappa, G.S. Biradar and Rajeev Bairathi in their study '**Technological Gap in Chilli Cultivation perceived by Farmers**', studies about the technological gap in adoption of Chilli cultivation practices in Gulbarga district of Northern Karnataka during 2012. By following the simple random sampling, a sample size of 120 respondents was selected from six villages and ex-post-facto research design was used for the study. The findings revealed that 45.83% of farmers had medium technological gap followed by high technological gap (30.83%) about the Chilli cultivation practices. Among the various recommended technologies, the maximum gap were observed in seed rate (88.50%) followed by usage of weedicides (86.00%), seed bed preparation (85.32%) and spacing (55.00%), and seed treatment (62.82%), plant protection measures (46.66%), use of manures (38.23%), seedlings per hill (28.50%). Further, limited of knowledge, lack of technical knowhow, nonavailability of good quality of inputs at right time, sub-standard and costly chemical fertilizers and pesticides, lack of purchasing power, fear of crop loss etc were expressed as reasons for technological gap in adoption of Chilli cultivation practices.

6.S.Mahendra Dev (2012) in his paper '**Small Farmers in India: Challenges and Opportunities**', examines the roles and challenges of small holding agriculture in India. It covers trends in agricultural growth, cultivation patterns, participation of small holding agriculture, productivity performance of small holders, linking small holders with markets including value chains, role of small holders in enhancing food security and employment generation, differential policies and institutional support for small holders and, challenges and future options for small holding agriculture including information needs.

7. In the article '**Price Discovery Process and Volatility Spillover of Chilli spot and Futures Prices Evidence from National Commodity and Derivative Exchange Ltd (NCDEX)**', authors Aloysius Edward .J and Narasimha Rao T.V talked about the importance of the commodity derivatives. As around 57 per cent m population is employed in agriculture sector, they talk about the agriculture role if India wants to achieve 8–10 per cent growth. India is among the top five producers of most of the commodities besides being the major consumer of agriculture, bullion and energy products. This paper discueeses on chilli production, export and import trends. It also examined the price discovery mechanism and causality between chilli spot

and futures markets using Co integration and Vector Error Correction Model (VECM) for the period from 1st April 2006 to 31st March 2013 for the National Commodity and Derivatives Exchange Ltd. The results indicate that futures chilli price leads the spot price. Chilli futures markets provide the direction and farmers' active participation in the futures market certainly improves the efficiency of the futures market. It is inferred that the chilli futures market is efficient.

8. In the article, '**The Role of Derivatives in the Commodity Market**', Soumya Mukesh, discussed the history of commodity derivative market in India. Author discussed about the reintroduction of commodity derivative markets and the current trends, strong growth potential of the market, the actual growth trajectory, the attitude of the policy makers and the efficiency of the regulatory mechanism. Author said that investing directly in the agricultural products and commodities gives the investor a share in the commodity components of the country's production and consumption. Money managers and average investors, however, usually prefer commodity derivatives rather than commodity themselves. The average investor does not want to store grains, cattle, crude oil or metals. A common investment objective is to purchase indirectly those real assets that should provide a good hedge against inflation risk.

9. G S Biradar and D M Chandrgi in their study, '**Socio Economic Profile of Chilli Farmers and their Constraints in Chilli Cultivation in North Eastern districts of Karnataka**', focussed on technological gap in adoption of chilli cultivation practices in Raichur and Yadgir districts of North Eastern Karnataka during 2011-12 based on highest area under chilli cultivation. The ex post facto research design was used for the study. The findings revealed that Majority (78.33%) of the farmers expressed problem of price fluctuation followed by inadequate irrigation (62.50%) and same per cent of them expressed the non-availability of labourers at critical stages and high wages, non-availability of good quality inputs at proper price at right time (59.17%). And the major suggestions made by the respondents were minimum support price should be fixed for chilli (86.67%), followed by market should be nearer, (65.83%), should provide good quality of inputs at right time at proper price (54.16%).

10. Dr. A. Siva Sankar and Dr. K. Nirmal Ravi Kumar in their study '**Domestic and Export Competitiveness of major Agricultural Commodities in Andhra Pradesh**', worked on the performance of regulated agricultural marketing system as it critically analyses the extent of market orientation of farmers and the competitiveness of agricultural commodities both in the domestic and international markets. The study revealed that, there exists positive growth in prices of major commodities in the selected regulated markets of Guntur district, a representative market for Andhra Pradesh. Except chillies and turmeric, the other major commodities exhibited positive trends in prices. The declining trend in prices of chillies and turmeric was only a temporary phenomenon and it was mainly due to the existence of higher market concentration with reference to commission agents and traders. For nearly half of the year period, the prices were below the average seasonal index with reference to all the selected commodities. The present agricultural marketing system is still face problems leaving many number of farmers in a dilemma in continuing the agri-business or not. Researchers said that farmers were not in a position to reap higher returns from the agri-business. Lack of adequate storage facilities, scientific grading facilities, processing facilities, efficient transportation facilities, poor marketing information network etc., are still old and persistent problems affecting our domestic trade.

Need for the study

Chilli growers/farmers are facing problems in production and marketing of produced. Growers' aggressive production practices like cultivation in semi dry lands and excess usage of Bt seeds often lead to a high expenditure and usage of high inputs, which leads to change in crop returns and profitability. Excess usage

of fertilizers and chemicals will bring down soil natural fertility and results in pest resurgence, health and environmental hazards. Heavy and untimely rains along with Bt seeds are also major causes in productivity variation among all states where chilli is produced. Though Andhra Pradesh and Karnataka are the major states for chilli production, the farmers are facing problems in turning the production into profits. In spite of measures taken by Government of India, suicides are more in the chilli farming community in Andhra Pradesh. This study tries to explore options and new technology available for chilli growers to cash their labour and production.

Objectives of the Study

1. To know about the chilli cultivation and its growth in India in general and Andhra Pradesh & Karnataka states in specific.
2. To understand the problems faced by the chilli producers in Producing & Marketing.
3. To study the risk managing procedures and tools available for chilli growers

Research Methodology

Conceptual and empirical methodology adopted in meeting the objectives. Data is collected from different research articles, journals and commodity derivative exchange sites. Conceptual methodology is used to know about the derivatives, chilli production and marketing procedures and empirical method is adopted in collecting the data from various sources and experts in the area of chilli cultivation and related issues. Paper just throws light on chilli production, marketing problems, risk management procedures, government initiatives towards betterment of chilli producers in general and in specific with Karnataka and Andhra Pradesh.

Analysis and Finding

Problems

Marketing of agricultural produce which involves moving agricultural product from the farm to the consumer, has not gained as much focus as the agricultural production gained in India. Generally in the developing countries like India, the agricultural marketing services will be attached to their respective agricultural ministries which help in development of market information, infrastructure development, marketing extension and training in marketing. Agricultural ministries with its supportive policies, legal, institutional, macro-economic, infrastructural environment focuses on agribusiness. Ministry main duties are regulation, promotion, agricultural research, price supports and agricultural subsidies, plant diseases and invasive species. Indian farmers are facing the problem of disposal of their produce and this problem is gaining equal importance along with the modern production technology adoption. Supply chain involved in reaching each product from the farm to the ultimate consumer plays a crucial role in determining the price of the product and gain to the farmer. Every producer has realised that the evolution of new production technology alone cannot help him in realizing returns without the improvement of agricultural marketing system which requires simultaneous efforts and improvement in both the areas of production and marketing of the produced. Bt technology and other modern techniques which bring high yield and other incentives alone will not attract farmers for longer time unless there is a breakthrough for good and stable marketing system which enables stable returns. Stable prices will induce the cultivators to expand production and increase their marketed surplus. Instability in yield and prices is more in case of commercial crops like chilli, cotton, and pepper and it has posed a serious problem in generating stable income to the farmers. If the sustained breakthrough in agricultural sector has to be achieved, the farmers are to be relieved of the risks and uncertainties involved in agricultural production and marketing. Chilli producers in India are no

exemption to risk facing like any other commercial crop producers. From the research works of many scholars and analysts, it is understood that lack of scientific storage facilities in the market yards, low competitive environment in the market due to large scale market concentration between commission agents and traders, lack of scientific grading facilities in the market yards, poor market information network, and ineffective implementation of Pledge loan scheme are some of the major issues additional to the production issues faced by the farmers. From the review of literature we understand that, Chilli is widely grown in states, among them occurrence of viral diseases as well as ravages caused by insect pests are significant ones (Gundannavar et al 2007). The pest spectrum in chilli is complex with more than 293 insects and mite species debilitating the crop in the field as well as in storage (Anon, 1987). During the last two decades insecticidal control of chilli pests in general and especially in irrigated crop characterised by high pesticide usage, has posed problems of residues in the fruits (Joia et al., 2001). Besides pest resurgence, insecticide resistance and destruction of natural enemies (Mallikarjuna Rao and Ahmed, 1986), both domestic consumption export of chilli necessitates production of quality chillies devoid by contamination of pesticides, industrial chemicals and aflatoxins.

Low yield, seed cost, and Non-availability of quality seeds are other issues to be concerned about. Low yield is the major constraint across most of the chilli producing states like Andhra Pradesh with different soils and climates not suiting to the requirements. Luring of high yield due to high promoting by seed companies selling Bt cotton seeds, farmers are forced to pay exorbitant rates. The high cost of Bt cotton seeds is limiting the cultivation by the economically poor farmers though they foresee good returns. Non-availability of quality seeds and pest occurrence are the concerning problems occupying the next places. In spite of heavy promotion done by Bt seed companies, farmers feel that even quality seeds are not available with Bt technology and it is the constraint hindering the adoption of Bt technology. Along with the availability of quality seeds, quantity is the limiting factor even if the quality seeds are identified with Bt technology. Inadequate market information which is a major means to increase the efficiency of production and marketing of the produce is a considerable problem in Indian states. Information dissemination is crucial to the farmers to make informed decisions about what to grow, when to harvest, to which market produce should be sent. It helps to estimate the demand for the product and in decision making on storing the product in warehouses till demand arises. It is estimated that the awareness of farmers on different components of market information and its utility was very poor compared to that of traders in supply chain who exploit information and gain more. Large price spread, high commission charges and transportation problems are contributing to high risks with the lack of regulated market facilities. As per the bye laws, middlemen should get 2 per cent of the value of produce from the traders as their commission and the farmers need not pay anything as commission. But in reality, the commission agents are receiving commission from both the farmers as well as traders. The farmers are paying to the extent of 2 to 4 percent due to credit link they have with these men i.e. majority of the farmers get the credit facilities from the commission agents both in the form of cash and inputs like seeds, fertilizers and pesticides with an agreement of selling their produce to them only. Non- remunerative prices, lack of grading facilities and large price spread are part of other problems faced by producers. The high price fluctuation during harvesting coupled with immediate cash needs of farmers will make farmers to go for distress sale, which will not fetch remunerative price for their produce. In marketing of the cash crops intermediaries like commission agents, wholesale trader, village trader are involved in supply chain between the producer and consumer and because of this multiplicity of middlemen, the price spread is larger and margins eaten away by these intermediaries are affecting the producer's share in consumer rupee. Because of high margins of the middlemen and more number of intermediaries in the marketing of chilli, price received by farmers is less. Generally, the net price received by the producer will be 30% of the total price paid by the consumer in the countries like India whereas it would be 66% in developed nations with systemized agri markets. Most of the farmers do not have

accessibility to roads to reach the regulated markets, as infrastructural development in villages of India is still a continuous process in many states. Regulated markets and warehouse facilities are generally at city levels and moving the produced to markets itself is big problem with either bad roads or no roads. Overall, the problems associated with marketing of chillies in Andhra Pradesh and Karnataka according the impact on returns are poor transportation facilities, poor market information, delay in sale of produce, poor weighing procedures, unfair practices during in open auction, Delay in payments from agents, collection of excess commission, lack of storage facilities at market yard, poor finance for ware house receipts during lean market prices, and lack of facilities for farmers at market yard.

Hybrids dominated all the pure bred varieties and less resistive nature of hybrid culture made crops highly susceptible to pest attack and damage which was the major issue in most of the regions for all crops since 1993. High yield and more returns lured the farmers and all most all commercial crops farmers turned towards the hybrids. Vulnerability of hybrid cash crop like chilli to pests brought frequent crop failures as well as fluctuating and declining yields which forced the farmers to bear additional expenditure for usage of pesticides. It is observed that pests are attacking chilli crop at various stages of its growth leading to sever reduction in yields and resulting in massive pesticide usage by farmers with high cost of cultivation. It is estimated that the maximum percentage of pesticides usage goes to two commercial crops cotton and chilli crops. The pesticide consumption is slowly coming down in cotton cultivation with the introduction of Bt cotton whereas still the same case with chilli. Many instances the dry chilli exports to Malaysia from Guntur market were rejected because of pesticide residue problem. Monsanto, a US based company came up with Bt technology seeds to help the famers who are in dire need of a new technology and seeds to lend them a hand from the troubles of hybrid seeds. Farmers started using of Bt seeds as they found the technology reduces the pesticides usage and increases the effective yield. Much promoted Bt seeds usage was said to have advantages of reduction in the use of insecticides by almost 50%, reduction of the harmful effect on the environment, good quality of chilli at par with that of no-Bt cotton, better yield per unit of input use, and lesser residue of pesticides in the fiber resulting in reduced harmful effects such as allergic reactions. Though there were negatives shades of Bt usage in the form of impact of eco-system and high cost seeds and possibility of Bt gene entering in to the human food chain etc., farmers were lured with the increased yield with less pesticide usage which was covering a major share of production expenditure. There was a problem of transgenic varieties leading to disappearance of native varieties and biodiversity in the country, and insects becoming resistant to Bt cotton making the pest control even more difficult in the near future. Risks associated with all such factors affecting the returns to farmers are to be addressed through risk management products and procedures.

Risk management is the process to minimize the losses arising in producing and marketing the chilli, includes recognizing risks associated with production and marketing, separating and prioritizing risks, measuring the likely impacts on yields and implementing a correct risk management practice to minimise the adverse effects of risk on return in terms of price, production and yield variation. Price risk arises when the crop is stored for future delivery or sales in terms of price change. Production risk arises from the quality variation in production and storing for long time and Yield risk is generated through over and under production than estimated quantities. Yield risk is higher when farmer makes an agreement with an intermediary with a pre-fixed price. In case of under production, producer may need to forego returns in order to deliver promised quantity through purchasing from other sources. In case of over production, demand comes down and need to dispose the balance at cheaper rates in the market. Counterparty risk arises when agreed contract terms are not honoured by either party in delivering the produce or settling the payment.

Derivative products have the ability to shift the price risk from producers. Chilli futures are standardized, exchange-traded contracts in which the contract buyer, generally the speculator or intermediary or a

consumer agrees to take delivery from the seller, generally the producer, a specific quantity of chilli at a predetermined price on a future delivery date. Chilli producers can employ a short hedge to lock in a selling price for the chilli they produce, while businesses that require chilli can utilize a long hedge to secure a purchase price for the commodity they need. Consumers and producers of chilli can manage chilli price risk by purchasing and selling chilli futures. Speculators assume the price risk that hedgers try to avoid, to profit from favorable price movements. Speculators buy futures when they believe that chilli prices will go up. Conversely, they will sell futures when they think that prices will fall. Futures provide producers, consumers and merchants a means of price risk management. Farmer, a hedger whose principal economic activity is production, trading, processing and consuming physical commodity, uses futures to reduce price risk due to unfavourable market movements. The chilli futures contracts in, NCDEX are found to be most suitable contracts available to farmers for hedging prices of chilli.

Benefits of Hedging Products

Farmers/growers benefit through the price signals emitted by the futures markets and information dissemination done by different stakeholders in various methods. The primary benefit of the commodity derivatives is price discovery mechanism through futures market. The futures markets information helps the farmer to realize a price and price variation at the time of harvest itself which helps the farmer to plan in advance what to cultivate, where to store, when to sell to gain maximum returns and so on. Access to regular information on chilli demand in national exchanges and international exchanges through futures prices enables the farmers to take right and informed decisions on storage options of the chilli in cold storages. Information makes them to understand the trends in prices and demand make them to retain the product and realize better prices and returns. Regular dissemination of price information by Forward Markets Commission with the help of national commodity exchanges is helping the farmers to track the market demand and price information is helping farmers to negotiate prices when the crop comes out. Price dissemination happening in all major villages of all the states through display boards on regular basis is a good reference to assess spot prices. Disseminated price information is bringing farmers and traders at a platform with correct price negotiations and it also creating awareness on mechanism of locking-in, the desired prices. In absence of futures market, farmers try to manage their risk by collecting the information from local mandis and accordingly planning their process. Lack of storage options and vagaries of weather, cash requirement to repay loans, manage household expenses, preparation for the next season and social obligations, lack of formal credit facilities, marketing avenues push the farmers to sell the crop in absence of the futures markets and information availability. The informal credit sources to the extent of 36-60% per annum, coupled with poor storage conditions leading to usage of more insecticides push the farmers to more risk of loss. Less transportation facilities make the farmers to sell the produce at doorstep itself at the mediator negotiated prices which make them to loose better returns.

Situation Analysis

Though commodity derivative products came into picture to reduce risk to the farmers/ producers, procedural constraints associated with these futures derivatives are averting the farmers to enter in to these markets. First and foremost constraint in existing chilli futures is contracts are available on very few varieties which is limiting all the farmers producing different varieties to participate. As futures are standardized contracts, the deviation from the specifications of contract in terms of quality and variety in the chilli may get rejected by the commodity derivative exchanges from the delivery. Participation of small and marginal farmers on commodity exchange have the procedural hurdles with PAN card, KYC norms, etc. for opening a demat & trading account along with savings bank account. Policy interventions by the Indian government are having impact on the direction and magnitude of price movements in commodities and discourage genuine market

participants and weaken the free-market behavior of commodity markets. Upfront of high margin amounts as initial margin to the extent of 5% on contract value, and mark to market (MTM) margins are major constraints to farmers who wish to hedge their price risk positions through commodity derivative products. Farmers, who do not have the formal credit facility and depend on local lending for cultivation and seeds, cannot pay these margins. The present unit of trading and delivery unit is 5 metric tons each in chilli futures. That is much higher for an individual farmer to enter into futures trading. Non-profit organizations who wish to help farmers as aggregators and want to trade on behalf of small farmers are not allowed to open demat account for trading purposes for any profit making activity as per the government procedures on commodity markets. Because of the low volume trades and positions from villages, brokers will not focus to serve these farmers, as their brokerage amounts are very less and transaction costs are high. In case of intra-day high volatility, providing timely notice to farmers on margin calls, arranging for money at a short notice and timely transfer of margin call amount to their trading account are some of the related issues when futures traded. In absence of prompt actions during these conditions, farmers may face the risk of liquidation or squaring off of their positions. Addition to all, few delivery centres, warehouses across the country under commodity exchanges are also causing the farmers to step back as the crop should be carried to prescribed warehouses in spite of bad transportation facilities available.

Supportive Measures Taken by Indian Government in Favour of Chilli Producers

Government of India is taking measures to bailout the farmers from the risk faced by them through different policies to produce better qualities and quantities and market the produced. It is providing support prices, and fixing the Minimum Support Price (MSP) for chilli and at this price government is procuring chilli from farmers. Government of India has launched Agricultural Marketing Research and Information Network Scheme through Directorate of Marketing & Inspection (DMI) to bring out improvement in the present market information scenario by linking all Agricultural Produce Wholesale markets in the States and Union Territories in a phased manner. Market extension a government initiative, is a vital service to enlighten the farmers about proper marketing and improving their awareness in various aspects of post-harvest management for efficient and cost effective marketing. It provides the information about the sources of credit availability, various Govt. schemes, policies, rules and regulations etc. Government of India through its bodies like Directorate of Marketing and Inspection (DMI), Spices Board (Ministry of Commerce & Industry, Govt. of India), Directorate of Economics and Statistics, Directorate General of Commercial Intelligence and Statistics (DGCIS), Agricultural Produce Market Committees (APMC) and State Agricultural Marketing Boards, at different state capital is trying to reach out the farmers to provide almost all services to bring out good returns and safe ways to cover the risks in producing and marketing. Government is motivating to expand the area of commercial crops cultivation and productivity. It is into research and development to bring out high yielding varieties along with allowing the MNCs to sell their Bt seeds. Government is trying to bring out drastic improvement in productivity, quality through cultivation of hybrids, Bt cotton varieties, latest production technologies and plant protection technologies, adoption of scientific and agronomic practices by farmers, increase in area under irrigation seeds.

Conclusion

India being largest producer and consumer of chilli with number of varieties and occupying a good market share in exports is not providing good returns to chilli producers. Andhra Pradesh and Karnataka farmers cultivating chilli under a major portion of cultivation land are subjected to different risks associated with production and marketing of the cotton produced. Though very recently Karnataka farmers have seen good returns through Bt seeds cultivation, they have suffered a long time with different risks right from selection of seed to selling the harvest to traders. Problems like formal credit facility, seed price, pests attack, heavy

usage of insecticides and pesticides, un-seasoned rains, water shortage, and fertilizers are faced by these farmers at the cultivation and harvesting level. Above all, when the crop is yielded, quantity and quality issues bother the farmers much. Due to unavailability of formal markets at reachable places to sell the crop, transportation and expenditure burdens to shift to markets, insufficient storage facilities, warehouses at near places are making the farmers to face the risk of selling the produced at good prices. Interest on unorganised loans, compelled agreements with agents and local merchants are forcing them to deliver the produced at cheaper prices which is realizing them half of the returns that they are supposed to realize in organized markets. Poor understanding of Volatile Price fluctuations, which affect the benefit of farmers, poor post-harvest practices like drying, cleaning, grading, and packaging, delay in payment after sale, problems in fare price evolution process, collection of excess commission and availability of loan through bank on produce important problems that chilli farmers are facing in this market.

Indian government has paved way to commodity derivatives in agricultural products in order to help the farmers to hedge their risks through trading in futures. Under the Forwards Markets Commission with the help of National Commodity Exchanges, it is disseminating the demand and price information through display boards in villages and mandis. The information on the boards, futures prices signal the farmers to choose the crop, time to cultivate, when and where to store, and price at which they need to sell in the spot market or in the futures market. Derivatives help the chilli farmers to reach the international demand information along with the international prices which are reference values to decide on producing and marketing. Government of India along with allowing commodity trading in chilli in NCDEX, is supporting farmers to cultivate the chilli through advanced technology and scientific methods of cultivation and focussing on research and development in area of chilli to give good quality seeds which yield higher quantities. It is providing minimum support price to chilli produced in order to bailout the farmers who are at mercy of agents and intermediaries whenever there is demand shortage due to international impact on chilli exports. In spite of measures taken by the Karnataka and Andhra Pradesh governments in terms providing credit facilities, advances against pledge of the crops, subsidies, financial support in terms of 50% of expenditure sharing in case farmers are going with organic farming and technical knowhow in supporting chilli growers, still suicidal cases are seen in both states and more Andhra Pradesh. The soil, scarcity of water, sometimes un-seasoned heavy rains, floods are making the famers of Andhra Pradesh and Karnataka to take hasty decision of suicide leaving the families at distress. Requirement of heavy pesticides, costlier Bt seeds and greed of higher yield even if climate and soil are not suitable to chilli are some of the reasons pushing the farmers to face the risk of heavy losses.

Though chilli futures are designed to hedge the risks of price variation, they have shortcomings in the form of procedural constraints like demat account, PAN card, KYC norms which are a distant facilities to farmers. Minimum lot sizes of chilli (5 MT), initial margins to the extent of 5% on contract value, huge MTM margins are making farmers helpless in using hedging through derivatives. Minimum number of chilli delivery centres, few authorized warehouses, quality constraints, standardized norms in contracts, less support from the exchange brokers, and different maturity dates on futures contracts from harvesting dates are some of the other problems which are restricting the farmers from taking position in chilli futures.

Along with the existing policies and procedures of government on chilli segment, more measures are required in the areas of diversified production activities as well as diversified marketing aspects of agricultural commodities. Out of the expectations of farmers on grades, quality, prices in potential markets, price projections, only real time arrivals and prices were documented and disseminated with traditional approach. Hence, there is a need to create awareness among the farmers through the agricultural extension agencies like the State Department of Agriculture, Krishi Vigyan Kendras so that the marketing information on agriculture commodities are incorporated in the extension services along with production aspects to the farmers. Restriction on participation of financial institutions (Banks, Mutual Funds, FIIs) also undermines

the liquidity on commodity exchanges and allows trading on many contracts to be exposed to price manipulation and market cornering. More focus on training the farmers on usage of derivatives to hedge risks individually and in aggregate manner has to be focused.

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