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## Innovative Technologies, Institutions and Policies for Successful Value Chains for Tur Farmers: A Case Study of NCDEX Spot

Rajesh Kumar Sinha<sup>a</sup> and Ranjit Kumar<sup>b\*</sup>

<sup>a</sup>NCDEX Spot Exchange, Mumbai, Maharashtra

<sup>b</sup>National Academy of Agricultural Research Management (NAARM), Hyderabad - 500 407, Andhra Pradesh

### Abstract

The electronic spot exchange provides synergy among the existing marketing systems in the country with its improvised technology and reach through the online system as it brings a variety of benefits to the existing system such as price transparency, better price realization for farmers and lot of arbitrage opportunities for trader community. These exchanges are aimed at enhancing efficiencies of the existing value chain of commodities by developing appropriate platforms for modern spot markets, financing of commodities based on credible warehouse management arrangements, reducing transaction costs, supporting Futures Exchanges, regulators and the Government with standardized and structured spot markets for compulsory delivery in all agri-commodities. Successful operation of such technologies-driven initiatives require congenial policy support as these are largely governed under the state laws of APMC. From the case study of NCDEX SPOT market in the Gulbarga district of Karnataka state, it has been observed that for facilitating the small and marginal farmers in participating in new age marketing system, it is required that all the stakeholders work seamlessly in an integrated manner, which are state agencies (warehousing, APMC, Mandi, Board, etc.), financial institutions, other infrastructural facilities, etc. With the help of NCDEX SPOT, tur grower-farmers in the Karnataka states are able to reduce the marketing cost by 50-70 per cent and are also able to sell their produce, whenever they want by paying a small charge for warehousing. It is also evident that the farmers could realize, on an average, 5-10 per cent higher price for their produce as compared to traditional APMC market. Although the business model seems to be working successfully and showing reasonable confidence to all the stakeholders, requires for upscaling across the board customization according to the law of land of respective states. However, it is a win-win proposition for the farmers-state governments-NCDEX SPOT-banks, etc, as it creates values at every stages of value chain.

### Introduction

Value chain in marketing of agricultural commodities has been in existence for long. However, recent surge in price of agricultural commodities even with negative overall inflation during June-August 2009, depicts the cascading effect of inefficient value chains, besides short supply. It has been observed that intermediaries in agriculture in the form of commission agents at *mandis* (government regulated markets) operate at 4-5 per cent margins, intermediaries at wholesale markets get around 30 per cent, and retail

vendors make around 20-40 per cent. Consequently, the price of a commodity that ranges between Rs 5 and Rs 7 per kg at farm gate eventually costs around Rs 15 per kg at the consumer level. Through supply chains, producers can have access to market information and knowledge to hone their value-added activities. Gulati (2009) has opined that the corporate sector has an important role to play in the generation and diffusion of technology in the years to come. This can be a major driver of change in the Indian agriculture. However, technological advancement alone, without access to markets, is not sufficient to bring about a revolutionary change.

\* Author for correspondence,  
Email: [ranjit\\_kr@yahoo.com](mailto:ranjit_kr@yahoo.com)

The advantages of supply chain management are numerous; these include reduction in product losses, increase in sales, reduction in transaction costs, better control of product quality and safety and dissemination of technology, capital and knowledge among the chain partners. Supply chain development not only benefits the private sector but also creates spin-offs that stimulate social, economic, environmental and sustainable development in the region. Public support (e.g. development of the institutional infrastructure) plays an important role in creating an enabling environment for the private sector development. An efficient value chain in agricultural commodities must be cost-effective with only necessary participants required to do the job in any given value chain. Each point in the value chain, right from production to consumption has certain costs. Owing to inefficiencies at various points in the value chain, the producer gets less than optimal and the consumer pays more than optimal price. An elongated and inefficient value chain does not create value to the participants. Instead, it destroys some of the inherent value that could encourage the producers to produce more and consumers to pay less and still get the best produce with desired service levels.

Value creation can be done at the following levels:

- Pre-production
- Production
- Post-production and primary processing (sorting/grading / drying, etc.)
- Collateral management (includes warehousing, collateral credit)
- Logistics and supply chain
- Processing, and
- Wholesaling/Retailing, i.e. reaching the end consumer

Different organizations are involved at different stages to create better value at each of these stages. These include research institutions, agri-input companies, equipment manufacturers, infrastructure companies, warehousing companies, logistics service providers, processors, wholesalers/retailers and financial institutions. Each of these participants is linked by different institutional mechanisms. It is expected that such structure and institutional mechanism would continue to help these value chain participants more

efficiently than before and thus, create an efficient value chain that brings in better realization to the producer and a better value to the consumers alike. Marketing and financial institutions play a critical role in any given value chain, as these are the key drivers in any value chain. This research paper focuses on how an efficient market could link different parts in a value chain to give maximum price to the producers.

### **Introduction to Spot Exchanges of Agricultural Commodities**

In India, the experiment of commodity exchanges has remained a debatable issue, though it has existed since long for individual commodity. Organized commodity derivatives in India started as early as 1875, barely about a decade after they started in Chicago. However, many feared that derivatives fuelled unnecessary speculation and were detrimental to the healthy functioning of the markets for the underlying commodities. As a result, after independence, commodity options trading and cash settlement of commodity futures were banned in 1952 (Ahuja, 2006). Derivatives are used to reduce or eliminate price risk arising from unforeseen price changes. A derivative is a financial contract whose price depends on, or is derived from, the price of another asset.

After the initiation of process of economic reforms in 1990, the Government of India had set up a Committee (headed by Prof. K.N. Kabra) in 1993 to examine the role of futures trading. The Committee recommended allowing of futures trading in 17 commodity groups. It also recommended strengthening of the Forward Markets Commission, and certain amendments to Forward Contracts (Regulation) Act 1952, particularly allowing options trading in goods and registration of brokers with Forward Markets Commission. The Government of India accepted most of these recommendations and futures trading was permitted in all recommended commodities. Three national level (NMCX, MCX, NCDEX) and 21 regional commodity exchanges are currently operating in commodity derivatives, but farmers' knowledge about all these is very poor and they still sell their produce to the same old traders they are used to. So, the dream of commodity exchanges changing the plight of farmers is hitherto a mirage in India (Thomas, 2003).

Spot exchanges are new electronic markets that make available benefits of online real-time trading with

guaranteed clearing and settlement facilities to the commodity producers, including farmers and processors. These exchanges are aimed at enhancing efficiencies of existing value chain of commodities by

- developing appropriate platforms for modern spot markets, i.e. spot exchange, e-mandi, e-linkage,
- financing of commodities based on credible warehouse management arrangements,
- reducing transaction charges,
- establishing benchmark prices for commodities, and
- supporting Futures Exchanges, regulators and the Government with standardized and structured spot markets for compulsory delivery in all agri-commodities.

National spot markets would seamlessly integrate the existing commodity markets across the country. These have enhanced employment opportunities for the existing participants through diversification of economic activities and value addition. *Pakka Adhatiyas* (Big Commission Agents) can become members of the spot exchange. *Kachcha Adhatiyas* (smaller aggregators that send the goods to *Pakka Adhatiya*) can work as promotion agents of exchanges, operate information kiosks, organize farmer clubs, bring synergies in rural institutions such as NGOs, SHGs, KVKs, etc. and can function as aggregators. On the other hand, processors and exporters will be able to take deliveries over the electronic spot exchanges, while Government will benefit from better collection of mandi taxes. The reduction in the number of intermediaries and lower intermediation charges will benefit farmers who can use both futures and spot platform to avoid distress sales.

### **Advantages of Spot Exchanges**

#### **Advantage to Farmers**

- Realizing the best possible price at the time of sale for agricultural produces
- Trade and payment guarantee
- Cost reduction in handling and other activities
- Access to a national level transparent market, where direct selling to processors or end-users would be feasible

- Increase in holding capacity due to availability of warehouse receipt financing
- Market intelligence reports

#### **Advantages to Corporates, Processors, Exporters, Importers**

- Choice of e-trading platform as per their requirements
- Facilitates bulk procurement operations without counter party and quality risks
- Customized services relating to storage and logistics
- Availability of professional services for grading and standardization
- Complete avoidance of hassles relating to physical market operations

#### **Advantages to APMC Traders**

- Common national level platform for buying and selling of commodities
- No counter party risk in trade
- Procurement and disposal of huge quantity possible

#### **Advantages to Futures Exchanges**

- Transparent spot market price source

#### **Advantages to Arbitrageurs**

- Easy mechanism for sale of deliveries received on Futures Market
- Advantage of cash-future arbitrage electronically

#### **Advantages to Financial**

- Ready base of select producers for institutional linkages
  - ◆ Pledge finance to priority sector

NCDEX Spot Exchange (NSPOT)<sup>1</sup> offers an electronic trading platform for trading in different commodities — agricultural and non-agricultural to various market participants, primary producers including farmers, traders, processors, etc. NSPOT was started with the objective of helping market participants in discovering prices at the national level and buy/sell goods at the national level, regardless of the confines of geography and providing 100 per cent delivery based electronic spot market.

**NSPOT Making Efficient Value Chain**

The systematic steps that are taken to harness market forces in support of the small farmer would not only provide relief to the small farmer in the near term but more importantly, work in consonance with market forces and therefore would feed into more sustainable longer-term solutions for the farmer. These steps could include improvements in the spot price discovery process, providing access to credit, development of reliable storage infrastructure, providing weather and crop related information and advice, and developing access to hedging and price risk management (Fernandes and Mor, 2009).

Traditionally, the chain between the farmer/producer and the consumer is lengthy through wholesaler and/or retailer at different levels. In terms of processes, there are post-harvest handling and management issues to be taken care of. This includes but is not confined to sorting, grading, storing, and processing before selling it to the traders who then further sell it at wholesale markets from where the goods are further sold at the retail level. In terms of intermediaries between the farmer and the consumer, there are *kachcha arhatiyas*, *pucca arhatiyas*, buying wholesalers, selling wholesalers and other trading

intermediaries, who add to the cost and inefficiency in the value chain many times without adding any value. NSPOT as an intermediary comes right after the farmer and hopes to remove the *arhatiyas* and bring the produce directly to the market (e-market) thereby reducing cost and increasing speed of delivery. The role of NSPOT is illustrated in Figure 1.

It is evident from Figure 1 that NSPOT can play an important role at two places in the supply chain immediately after harvest:

1. Check the NSPOT terminal for true prices (spot and futures) and decide where they want to sell the produce and;
2. Selling on NSPOT platform online, which may be immediately after harvest. The farmers could take advantage of the network of SPOT accredited warehouses for checking for quality as well as issue of warehouse receipt.

The advantages available to farmers for selling online on NSPOT are:

1. Wider reach among buyers, cutting across geographies, thus offers best price to farmers for their produce,

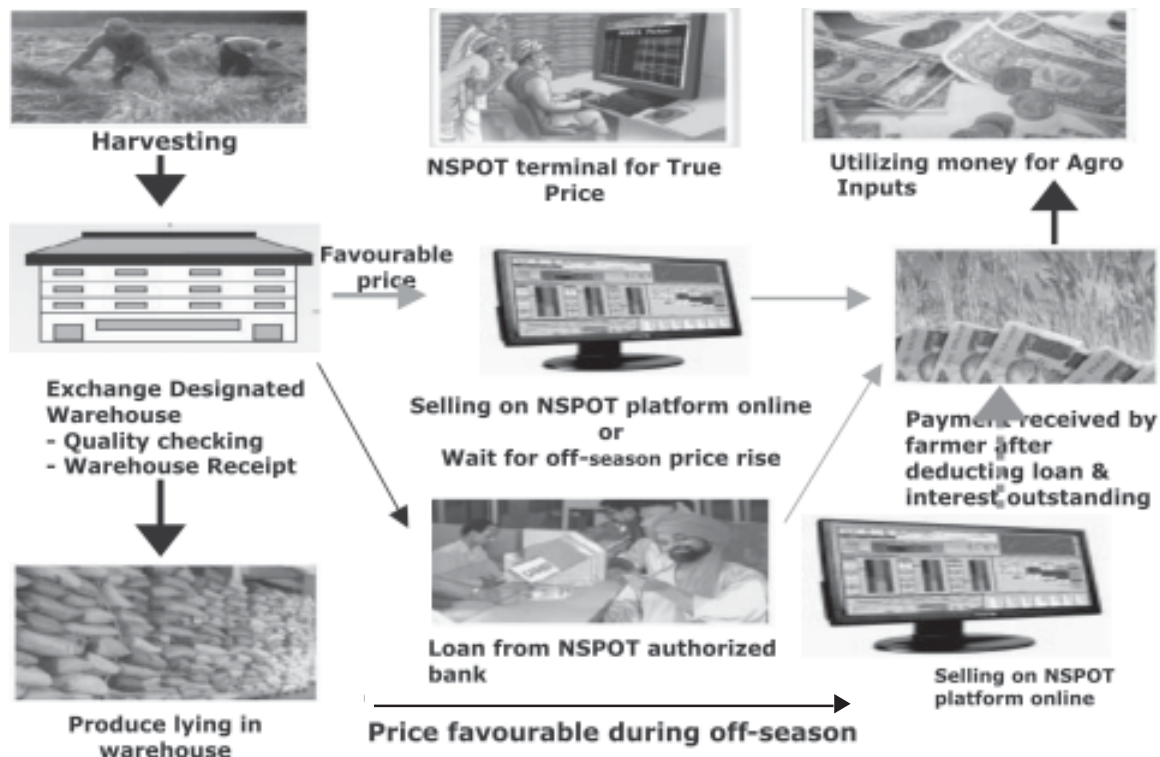


Figure 1. Role of NSPOT in making supply chain efficient

2. Increase farmers’ bargaining power, as they get a right to quote their own selling price, which is not possible in the existing APMCs,
3. Increase holding capacity of farmers by creating a mechanism for warehouse receipt financing by the banks,
4. Increase farmers realization by reducing cost of intermediation and connecting them to actual users directly, and
5. Guarantee of receiving money after 11 days.

NSPOT bring efficiency in the supply chain by bringing together the best in every field, viz. technology, banks (for clearing and settlement), assayers (for internationally traded commodities, NSPOT facilitates assaying and grading at the international locations) and warehouses providers (of NCDEX as well as NCMSL). Thus, NSPOT is able to provide all the interrelated services at the lowest cost (best price) to its clients.

**Transaction Flow in a Spot Exchange**

The electronic spot exchange complements the existing marketing system in the country with its improvised technology and reach through the online system. A farmer/seller would bring the produce to the accredited warehouse. The warehouse would weigh

the lot and assay it. After assaying, the producers are given a lot number for their produce. A seller can now put sale quote on the exchange. A buyer who has paid the margin money would put the buyers’ quote. Trade happens on matching of buyers and sellers’ quote. The buyer brings the balance amount of money on the settlement day. On receipt of the total amount, the exchange transfers the ownership of the goods to the buyer. The seller account is credited with the sale proceeds. The seller makes the invoice to buyer directly. The disputes if any are settled as per the exchange rules and the decision of exchange in this regard is final. The exchange operations are depicted in Figure 2.

**NSPOT and Value Chains for Tur Growers in Karnataka State**

India is the largest producer and consumer of tur (red gram) in the world, with 3.6 million ha under the crop, producing 2.6 million tonnes. Karnataka holds the second position in tur production and accounts for 20 per cent of the national area under tur cultivation. The area under tur cultivation increased by 2.3-times to 833,000 hectares in 2010 compared to 350,000 hectares cultivated in 2009, thus raising hopes of a bumper crop. With an average production of five quintals per hectare, the state can expect a production of around 4.1 million

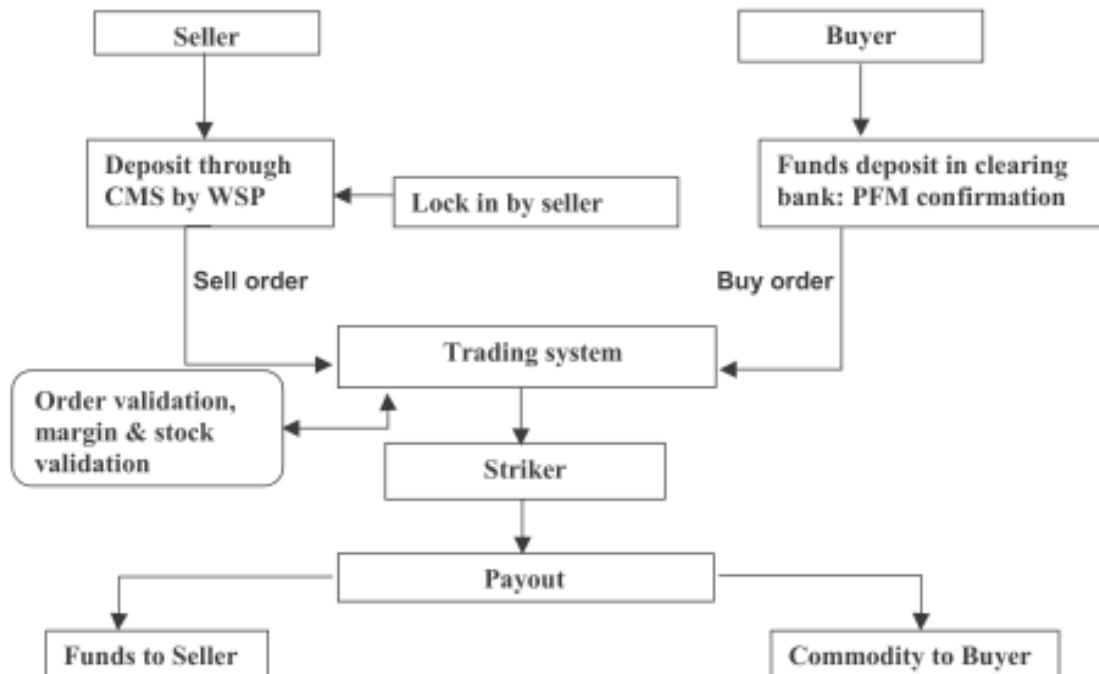


Figure 2. NCDEX Spot Exchange trading process — A schematic representation

quintals of tur this year (2010), which is 2.5-times more than production of 1.6 million quintals in 2000. Gulbarga district of Karnataka state is known as 'Tur Bowl' of India with around 0.30 million tonnes of production. NSPOT obtained license to start spot exchanges for various commodities in Karnataka. Subsequently, spot exchange in tur was launched in January 2010 at Gulbarga after discussions with inclusion of all the value chain participants including farmers, traders, commission agents, brokers, trading corporates, and end consumers.

NSPOT encourages the farmers' deposits by providing them with transportation, packaging and labour cost on recoverable basis in collaboration with Tur Board and MYRDA — an NGO. The later aggregates farmer stocks through its farmer facilitation centres (FFC) spread across 12 locations in the Gulbarga district of Karnataka state. These stocks are brought to the accredited warehouse of NSPOT, managed by NCMSL-warehouse service provider. Farmers can avail pledge loan on their deposits through banks. Once sale is concluded on the NSPOT, the proceeds are adjusted against pledged loan and other expenditure and balance are transferred to beneficiary's account.

### Value Creation by NSPOT

The NSPOT as an important facilitator in the entire value chain, creates value to all the stakeholders by

**Table 1. Cost comparison between traditional and NSPOT trading of tur in the Gulbarga district of Karnataka (Rs/q)**

Particulars	Cost	
	Traditional trading	NSPOT trading
Transportation	50 (Approx)	30 (Approx)
Weighment and sieving	6	12 (At FFC)
Soot (2kg/q)	100	Nil
Loading and unloading	10	9.50
Sampling charge (300g/q)	15	Nil
Quality assessment	Nil	1.66
Weighment charge in warehouse	Nil	0.40
Transaction charge	Nil	8
Commission (2% on sell)	100	Nil
Tur Board	Nil	7
Ware house charge/month	4.50	6
Total	285.50	74.56

bringing the quality produce to its own platform and offering it at reasonable price, which results into higher producers' share in consumers' price. The cost comparison, given in Table 1, indicates that the total cost of marketing by NSPOT is only 25 per cent of that of by the traditional APMC marketing.

The difference in price realization by farmers for tur sale is depicted in Table 2. It can be observed from Table 2 that in August 2010, in the traditional APMC market, the farmers were able to sell tur at prices between Rs 3400/q and Rs 3900/q, while net rate realized at NSPOT platform was Rs 3650/q to Rs 4100/q, which was 4-10 per cent higher. It was due to the reason that a buyer gets a subsidy of 25 per cent on the market cess (i.e., 0.45% of the traded price), who also saves 2 per cent *arhat* as per the system prevailing in the APMC. So, roughly a buyer stands to save Rs 800 (2% arhat) + Rs 200 (0.45% saving on cess) = Rs 1,000, i.e. Rs 10/q. On the other hand, 1 per cent premium on the traded price (as per our premium and discount structure) is also paid to the farmers. These above points set the platform for the farmer to get better price compared to normal APMC Market. Additionally, the usage of the electronic weigh bridge, being used on the exchange, ensures accurate weight of the produce. Further, the practice of collecting an extra 3-4 kg per bag from the farmer to account for damaged seeds is not carried out in the exchange, thereby saving the farmer an average of Rs 100 per bag, which was his loss in the traditional system. Hence, farmer has a bright chance to gain Rs (100+40+100) = Rs 240/q. The cost he has to incur to bring produce to the exchange comes to Rs 125/q. Since, this cost is upfront borne by the revolving funds created by Tur Board, a farmer does not have to bother about arranging funds / credit for this purpose. Needles to mention, that in the traditional system it is *arhat* who bears this cost. Thus, based on the above calculations, farmers can expect to gain Rs 100-120/q more than the normal trade in APMC.

With the help of NSPOT the farmers are also able to sale their produce during different months. As can be observed from Table 3, the produce of tur of REDTUR 121111 grade has been brought by the farmers between January to July which was settled between July to October 2010. During that period, the produce was kept at NSPOT designated warehouse with small charges (Table 4), where each lot was given a unique lot number.

**Table 2. Difference in price realization by farmers for tur sale**

Trade date	Trade rate (Rs/q)	Trade quantity (quintals)	Premium discount (%)	Net rate realized (Rs/q)	APMC rates on the traded days (Rs/q)		
					Min	Modal	Max
20.07.2010	4059	100.40	1	4100	3203	3928	4275
09.08.2010	3635	100.60	1	3671	2601	3417	3721
09.08.2010	3610	99.90	1	3646	2601	3417	3721
09.08.2010	3664	100.00	1	3701	2601	3417	3721
09.08.2010	3620	99.90	1	3656	2601	3417	3721
09.08.2010	3610	100.20	1	3646	2601	3417	3721
09.08.2010	3619	99.65	1	3655	2601	3417	3721
09.08.2010	3605	99.2010	1	3641	2601	3417	3721
09.08.2010	3615	100.00	1	3651	2601	3417	3721
09.08.2010	3612	100.40	1	3648	2601	3417	3721
09.08.2010	3625	99.85	0.5	3643	2601	3417	3721
12.08.2010	3610	96.95	1	3646	2507	3461	3732
16.08.2010	3624	103.85	1	3660	2901	3525	3925
17.08.2010	3885.75	100.40	1	3925	3000	3550	3911

**Table 3. Trading of tur by the farmers at NSPOT platform**

Sl No.	Lot No.*	Date of deposit	Settlement date	No. of days	No. of weeks	Trade date	Trade rate (Rs/q)	Trade quantity (t)
1	68...717	15-Feb-10	22-Jul-10	157	22	20-Jul-10	4059	10.04
2	57...670	2-Feb-10	12-Aug-10	191	27	9-Aug-10	3635	10.06
3	41...980	13-Mar-10	12-Aug-10	152	22	9-Aug-10	3610	9.99
4	68...714	10-Feb-10	12-Aug-10	183	26	9-Aug-10	3664	10.00
5	41...947	10-Mar-10	12-Aug-10	155	22	9-Aug-10	3620	9.99
6	57...668	30-Jan-10	12-Aug-10	194	28	9-Aug-10	3610	10.02
7	71...959	8-Mar-10	12-Aug-10	157	22	9-Aug-10	3619	9.97
8	43...001	28-Jul-10	12-Aug-10	15	2	9-Aug-10	3605	9.91
9	71...957	11-Feb-10	12-Aug-10	182	26	9-Aug-10	3615	10.00
10	57...669	3-Feb-10	12-Aug-10	190	27	9-Aug-10	3612	10.04
11	61...004	4-Mar-10	12-Aug-10	161	23	9-Aug-10	3625	9.99
12	33...004	18-Feb-10	16-Aug-10	179	26	12-Aug-10	3610	9.70
13	61...006	20-Mar-10	18-Aug-10	151	22	16-Aug-10	3624	10.39
14	48...700	10-Feb-10	17-Aug-10	188	27	17-Aug-10	3886	10.04
15	71...960	9-Mar-10	1-Oct-10	206	29	28-Sep-10	3590	10.16
16	41...929	10-Mar-10	1-Oct-10	205	29	28-Sep-10	3762	9.995
17	68...715	15-Feb-10	1-Oct-10	228	33	28-Sep-10	3730	10.09

\*Only indicative; the actual lot numbers given to each seller at the time of deposit at warehouse are unique.

## Conclusions

Despite significant departure from the slow growth of Indian economy since the 1990s, agriculture is a sector that has been left behind and its main

stakeholders, viz. farmers have remained in destitution on account of lack of access to crucial information, which limits their ability to obtain fair prices for their produce. Moreover, they have to deal with unscrupulous agents who often cheat them, and take advantage of

Table 4. Different charges applicable for trading at NSPOT platform

Lot No.	Trade quantity (t)	Trade value (Rs)	Settlement amount for buyer				Charges for Seller			
			Premium discount (%)	Basic trade value + premium discount value (Rs)	Mandi tax payment to APMC, Gulbarga	Trans. charges @ Rs 50/t	Net obligation from buyer	Warehouse charges (Rs)	Assaying charges + service tax (Rs)	Transport charges @ Rs 50/t
68...717	10.04	407527	1	411598	4321	502	415920	3378	331	502
57...670	10.06	365681	1	369337	3878	503	373718	4117	331	503
41...980	9.99	360639	1	364245	3824	499	368569	3254	331	500
68...714	10.00	366400	1	370064	3885	500	374449	3921	331	500
41...947	9.99	361638	1	365254	3835	499	369589	3318	331	500
57...668	10.02	361722	1	365339	3836	501	369676	4165	331	501
71...959	9.97	360633	1	364239	3824	498	368562	3352	331	498
43...001	9.91	357256	1	360828	3788	495	365112	319	331	496
71...957	10.00	361500	1	365115	3833	500	369448	3900	331	500
57...669	10.04	362645	1	366271	3845	502	370619	4088	331	502
61...004	9.99	361956	0.5	363766	3819	499	368084	3445	331	499
33...004	9.70	349990	1	353489	3711	484	357685	3719	331	485
61...006	10.39	376352	1	380115	3991	519	384626	3360	331	519
48...700	10.04	390129	1	394030	4137	502	398669	4045	331	502
71...960	10.16	364744	1	368391	3868	508	372767	4485	331	508
41...929	9.995	376012	1	379772	3987	499	384259	4391	331	500
68...715	10.09	376357	0.5	378238	3971	504	382714	4930	331	505



their lack of knowledge as well as education. Lack of information on the weather, pests and disease infestation also affects their ability to make a reasonable profit. Commodity futures trading in India, after remaining in a state of hibernation for nearly four decades, mainly due to doubts about the benefits of derivatives, came into existence on a promise to remove price risk to farmers. But, off late, it has remained elusive and has given an impression that the intended benefits to the producers of the commodities, which are traded on such platforms are not transferred, and in fact, different kind of intermediaries (speculators and investors) are getting much more benefit out of it.

Looking at the current dismal scenario of agricultural trade infrastructure in India, where a large number of mediators playing a spoilt-sport for the transparent price mechanism, it was a pre-requisite to set up such an infrastructure that can reduce buyers' hitch of getting quality agricultural produces at right prices and increase farmers' prospects with better valuation of their farm produces. The formation of spot e-trading mechanism at the Agriculture Produce Market Committees (APMCs) across the country seems promising to bring a complete makeover to the entire supply chain infrastructure. The case study of tur market in the Gulbarga district of Karnataka state is an example which explains that Spot Exchange can reduce the cost of transaction considerably to the farmers as well as the buyer can get the commodities at a reasonable price with assured quality. However, the model is still in transition and is yet to see its performance across the board over the regions of the country.

#### End-Note

1. NCDEX Spot Exchange was established on 18 October, 2006 by NCDEX, it became the first ever electronic spot exchange in India to go live on 12 December, 2007. Ministry of Consumers' Affairs through its notification in July 2008 allowed it to offer contracts in daily net settlement (DNS). In

January 2009, NSPOT offered its contract in sugar in DNS form. NSPOT offers an electronic trading platform for trading in a host of commodities, both agricultural and non-agricultural to various market participants, primary producers including farmers, traders, processors, etc. In a span of less than four years, NSPOT innovated on membership front to allow producers, processors and cooperative societies to directly participate on its platform. In April 2010, it took a leap forward by making available three different forms of electronic markets as per market needs. The platform is now being accessed from anywhere in the country and one does not need to set up its office to access this vibrant online market. Now NCDEX Spot Exchange is capable of providing electronic marketing solutions to all kind of spot markets. Its services are not limited to spot exchanges only as, it has started serving corporate, public sector units (PSUs) and other agencies with interest in benefiting consumers and producers alike.

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**Appendix****Contract specification of tur traded at NSPOT at Gulbarga district of Karnataka**

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Lot size	10 t after standard deduction of 0.5 per cent with +/- variation
Packing	100 or 50 kg in sound jute bags
Moisture content	12% max
Damaged/dicoloured grains	Up to 5% max
Foreign matter (including dust, sand & other admixtures)	1% max
Broken seeds	1% max
Ad mixture	0.5% max
Grain retention	Min 90% on 3.75 mm sieve
Tick size	Rs 1 per quintal
Quotation base value	Rs per quintal
Unit of trading	10 t (10000 kg)
Unit of delivery	10 t (10000 kg)
Buyer margin	9%
Validity	3 months from the date of sample collection

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