

Potato Supply Chain Analysis: Mechanism and Constraints

Binoy Tripura¹ and Souvik Ghosh²

^{1,2}Department of Agricultural Extension, Institute of Agriculture, Visva-Bharati, Sriniketan
E-mail: ¹bintri17@gmail.com, ²souvik.ghosh@visva-bharati.ac.in

Abstract—Supply chain refers to a systematic movement of the products from the farm to the ultimate consumers. This includes various intermediate processes of production, processing, distribution and marketing. It can be taken to be a domino-like motion where changes at any level in the chain affect the entire supply chain and these changes often manifest themselves in the form of change in prices. The present study attempts to examine mechanism of potato supply chain and constraints faced by farmers of Dhalai district of Tripura. It was found that Potato supply chain is highly fragmented and number of intermediaries in the chain is exceedingly high. These intermediaries are important because they act as a substitute for infrastructure where none exists. But over the years a layer of intermediaries has grown most of which add little value to the produce but collectively they add significantly to the final cost. The study also revealed that the share of the farmer in the total margin across the value chain of potato is considerably low and the maximum part of the margin is cornered by the intermediaries. The study has also listed the current constraints such as on-farm, off-farm and logistics constraints in the system and ends with recommendations towards weeding out inefficient mechanism of current potato supply chain system.

Keywords: supply chain, constraints, on-farm, off-farm, logistics

1. INTRODUCTION

Potato produces more edible protein per unit land and time than many other major crops such as wheat (About 85% of the potato plant is edible compared to 50% in cereals) (Food and Agricultural Organization of the United Nations, 2010). Supply chain refers to a description of the systematic movement of the food from the farm to the consumer. This includes various intermediate processes of production, processing, distribution and consumption. Supply chain can be taken to be a domino-like motion where changes at any level in the chain affect the entire supply chain and these changes often manifest themselves in the form of change in prices. In a supply chain, the resources and materials flow downstream for the production of goods and provision of services while the money paid by the consumer flows in the reverse direction to different elements involved in the chain. Singh and Rai (2010) an efficient potato supply chain is also important in ensuring rural prosperity and proper livelihood as it generates larger returns per unit land, time and man-hours. Therefore, the

present study is an attempt to examine, characterize and understand a chain to evaluate its performance and then use the analysis to identify the constraints which limit the efficiency of the chain. NERLP (2011) The state is a net importer of potato; around 70% (45 to 60 MT) of supplies per day at Agartala wholesale markets come from West Bengal and the remaining 30% demand is met from local production. Majority of the local population consumes potato. Agartala with a population 1,89,327 as per 2001 census (3.7 lakh after municipal expansion in 2004) is a huge market for potato consumption and depends on potato coming from both within the state and from West Bengal. Producers get only 50% of the value paid by the consumers; The remaining is taken by various channel partners.

2. METHODOLOGY

The present study was carried out in Tripura during 2015-16. Ex-post facto research design was employed. Out of total eight districts in the state, Dhalai district was selected keeping in view of highest population, population density and highest numbers of potato growers. A total five number of villages were covered. The data were collected by personal interview method with the help a survey schedule developed for the study. A total of 140 farmers were interviewed to mention his/her constraints.

3. RESULT AND DISCUSSION

The potato supply chain consists of various components along the chain. This section gives the brief description of these components. Potatoes are sold in the state throughout the year. Three to four months of demand (February to April) is met from local production and for the remaining period supply comes from West Bengal. There are 474 village level primary markets in the state where farmers sell local potatoes directly to the consumers. From wholesale market potato goes to two districts i.e. South Tripura and West Tripura. In the remaining two districts of Dhalai and North, potatoes come from Dharmanager wholesale market (North Tripura) and Silchar (Assam) wholesale market.

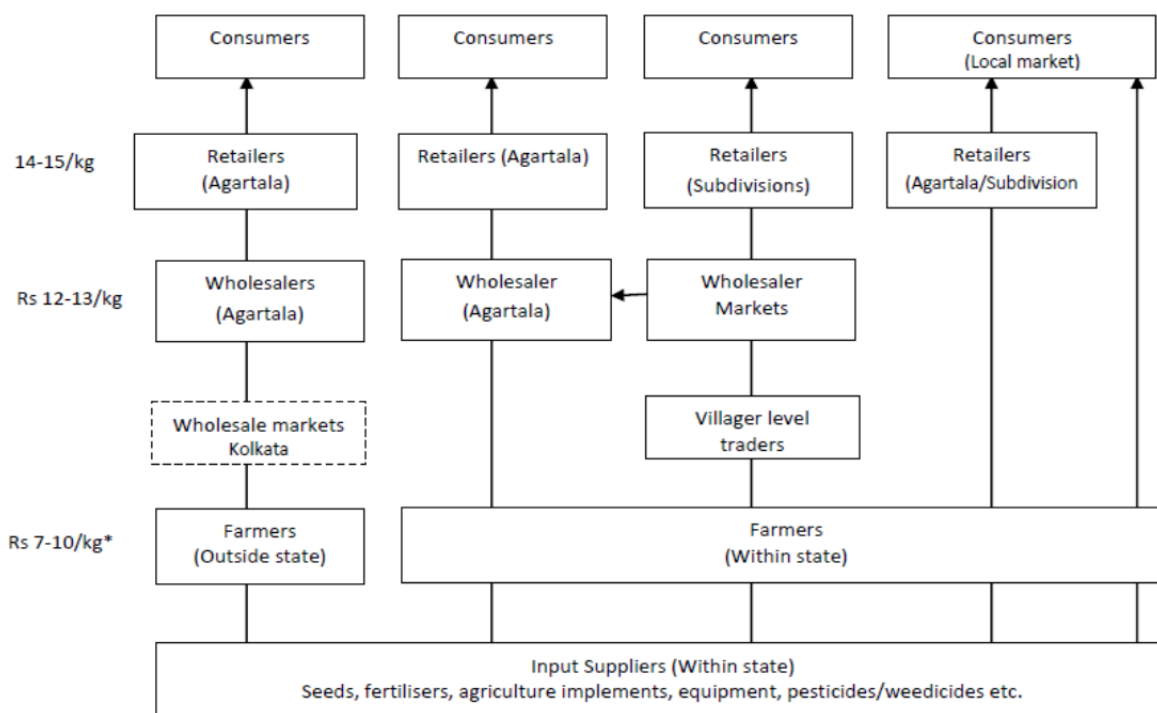


Fig. 1: Potato market chain analysis

Fig 1 shows various potato supply chain in Tripura. There are 5 types of potato chain functioning in Tripura; in many cases producers do not fair remuneration. The main inputs required for potato cultivation are seeds, fertilizer, pesticides/weedicides, and agri implements. The suppliers of these inputs are located at block, sub division level and at Agartala wholesale markets. All inputs are available in the state and which are available locally; all other inputs are procured by wholesalers from other states. Majority of the population of the state consumes potato. Consumers generally purchase potatoes, once or twice in a week from nearby weekly markets and daily markets in towns. Consumers prefer Kufri and True potato variety and purchasing is done in cash. Price paid by consumers varies from Rs 14 to Rs 20 depending upon potato variety, size, sorting and grading and also timing of purchase. In the morning prices are high and it reduces as the day progresses. Price of potato varies over a period of time in the year due to price fluctuation. Similar studies was done by Huq *et al* (2004).

4. CONSTRAINTS IDENTIFIED ACROSS THE SUPPLY CHAIN

The problems impacting the potato supply chain at the farm level can be clubbed under on-farm constraints. This section discusses the various major problems faced by the farmer in the production of potato.

Lack of quality inputs at affordable prices: Seed is the most important input in terms of cost and impact on the process of production. During the study it was observed that medium size tubers meant for table-purpose usage were used as seeds. The cost of certified seed available at subsidized prices in Patna was Rs. 1400/quintal. There was an additional cost of transportation to be borne by the farmer. Thus in most cases farmers store a part of their produce in the cold storage which is used as a seed. This had a considerable impact on the yield obtained.

Inferior farm technology: The level of adoption of modern technology was observed to be very low in Tripura. This can partly be attributed to the small size of land holdings in Tripura.

Poor access to formal credit: Tripura had one bank branch for 22,248 people in 2006 according to a Government of Tripura report. This was significantly worse than the national average of one bank for 15,000 people. This limited reach of banking institutions forced farmers to seek credit from informal sources such as private moneylenders who charged exorbitant rates of interest. At the site of study in Tripura, it was observed that rates as high as 5% per month were being charged by private moneylenders. On account of the low levels of awareness, collusion between bank officials and middlemen who charged huge commissions for assisting farmers in getting the credit and several other reasons, a significant part of the farmers contract their debt from private

moneylenders. The high cost of credit contributed significantly in increasing the cost of potato production.

Ineffective APMC markets: In the current marketing setup, APMC markets occupy an important position. Even though the APMC Act has been repealed in Tripura, a significant part of the produce is routed through APMC markets owing largely to the absence of effective alternatives. Going by their mode of operation, these markets are inefficient with opaque pricing process. They are plagued by collusion of APMC agents amongst themselves and with the traders thus depriving farmers of the fair price for their produce. There is a high level of physical wastage at this level of the supply chain. Also, the licensing of the commission agents acts as an entry barrier for other entrepreneurs to be a part of the supply chain.

Absence of an effective legislation to check collusion: There is no effective legislative enforcement to check the widespread collusion between different intermediaries in the supply chain which ultimately leads to low returns to the farmer and the high prices for the consumer.

Absence of effective supply chain management techniques: In Dhalai, as in other parts of state there is no master of chain who ensures the efficiency of the chain. As a result, practices like Demand-Supply matching, management of financial flows, efficient transport scheduling etc. have not yet found a place for themselves in the supply chain.

Low level of processing: An inefficient supply chain, an inferior quality of produce, high taxes and duties and very few food processing units has meant that the level of food processing remains at very low levels. This has acted as a serious impediment in the way of farmers getting more returns for the produce.

Logistic Constraints: In Tripura, there is insufficient infrastructure available for warehousing, distribution, cold storage and transport. Thus there is a huge infrastructure gap which leads to a high level of wastage across the chain. This in turn leads to a significant escalation in the price of the commodity.

Table 1: Constraints faced by farmers

ON-FARM	Lack of quality inputs at affordable prices
	Inferior farm technology
	Poor access to formal credit
NON-FARM	Ineffective APMC markets
	Absence of an effective legislation to check collusion
	Absence of effective supply chain management techniques
	Low level of processing
Logistic	Insufficient infrastructure

5. CONCLUSION

The margin analysis for potato supply chain for both peak season and off season loudly points towards widespread exploitation of the farmers in the current state of the supply chain. The supply chain is dominated by numerous intermediaries who do not add significant value along the chain but add a lot to the final price. The situation is further aggravated by a very little bargaining power of the farmers who in absence of a transparent pricing process are unable to receive a fair price for their produce. This is supported by the margin analysis presented in the study. For an effective overhaul of the supply chain towards a more efficient system, several measures have been recommended in the study. The private sector has to be encouraged towards an increased participation in the supply chain. The government will also have an important role to play in setting the overall strategy and ensuring its implementation, overhauling infrastructure and creating a conducive environment to attract sizeable investment in this sector in the future.

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