A study on Marketable surplus and Price Spread of Tomato in Mokokchung District of Nagaland

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ABSTRACT: *The present study is carried out on June-September 2011 to access production, market arrival, cost, price spread and efficiency of tomato in Mokokchung District. Longkhum village was purposively selected for the study because of high economics in tomato production. A sample of 50 farmers' cultivating tomato and 20 market intermediaries (10 retailers; 5 wholesalers; 5 Local traders) has been selected on purposive random sampling technique. The marketable surplus was 206.69 quintals (91.23%) after retaining 19.85 quintal (8.78%) for family consumption, religious payment and gift to friends and relatives. Marketed surplus was 196.83 quintal (86.88 %). Losses due to mishandling, breakage and spoilage were 4.35 percent. The most effective marketing channel for tomato was channel III (65.16%) followed by channel IV (20.4%), channel II (9.32%) and channel I (5.08%). In channel I, producers incurred all the expenses went through streets as vendors and sold the fresh tomato directly to the consumers. High marketing cost of local traders are their expenditure on transport, packing, labour, loading, unloading, communication, losses, tax, fees, and other miscellaneous cost. The producers share in consumers' rupee was highest in channel I (94%) and the lowest was in channel IV (48.07%). Producers share is directly related to the number of market intermediaries involved in the marketing of tomato. The percentage share of gross marketing margin in consumers rupee was (6%), (27.78%), (43.78%) and (51.93%) respectively in channel I, II, III and IV. Marketing efficiency ratio was found to be highest in channel I.*

KEYWORDS: *production, marketed surplus, cost, price spread, marketing margin and efficiency*

I.   INTRODUCTION

Nagaland[1] has basically an agricultural economy. Agricultural activities predominates the State economy. Traditionally, Jhum cultivation is the main occupation of the people. The Total area under tomato cultivation during 2003-04 was 679 hectares which increased to 810 hectares during 2010-11. Production was 702 MT and 4600 MT respectively. Area under tomato cultivation in Mokokchung District during 2003-04 was 77 hectares with the total production of 50 MT. During 2010-11, its area increased to 100 hectares while production increased by 1.11 percent from 2003-04 to 2010-11. Tomato is highest grown by cultivators in certain pockets only.

Though the marketing system is more concerned with the surplus which enters the market, the quantum of total production is essential for this surplus because larger the production, larger will be the surplus. Marketing of the surplus is crucial from the farmer's point of view. The net return to the farmers from the sale of its product through different marketing channels will determine the efficiency of the marketing system in the market. Unless marketing efficiency improves, cultivators will not be attracted to increase production. Higher share in consumer's rupee and attractive terms of trade will motivate the farmers for commercial production of tomato.

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[1] The State of Nagaland covers an area of 16,579 Sq. Km is located between 25°6'N - 27°4'N and between 93°20'E - 95°15'E. Topographically, the State is mountainous and the altitude varies approximately between 194 meters and 3048 meters above sea level. The Naga villages are usually situated on the hill top and at a higher elevation because of security reasons. The indigenous people of Nagaland, the 'Nagas' are primarily of Mongoloid race. According to 2011 census, the population of Nagaland is 19, 80,602. It recorded a negative growth rate of 0.47 %.The literacy rate was 80.11 percent of which male, 83.29 %; female, 76.69 %. 71.03 percent of the population lives in rural areas. The density of population is 199 per Sq. Km. The State has eleven Districts – Kohima, Mokokchung, Tuengsang, Wokha, Zunheboto, Phek, Mon, Dimapur, Peren, Longleng and Kiphire.

II.   STUDY AREA

Longkhum village covering an area of 29 Sq. Km. is one of the most tomatoes producing area in the District. It has 350 house-holds with 3,477 populations as per 2011 census (provisional, Nagaland). 85 percent of the population works on land. The present study is carried out on June-September 2011 to access production, market arrival, cost, price spread and efficiency of tomato in Mokokchung District.

III.   OBJECTIVES

The present study has been designed with the following specific objectives
1)   To estimate production, farm level retention, marketable and marketed surplus of tomato.
2)   To study the marketing channels and to analyze the marketing cost and price spread in the marketing of tomato.
3)   To analyze the efficiency in marketing of tomato.

IV.   METHODOLOGY

The present study was conducted in Mokokchung District of Nagaland. Longkhum village is purposively selected for the study because of high economics in tomato production. A sample of 50 farmers involved in tomato cultivation and 20 market intermediaries (10 retailers; 5 wholesalers; 5 Local traders) has been selected on purposive random sampling technique.

The cultivators were classified into three categories viz. small (below 2.02 Ha.), Medium (2.03 – 2.83 Ha.) and large (2.84- 4.01 Ha.) based on land holding size of the farmers using cumulative square root frequency method (Table 1). The collection of information is based on a structured questionnaire designed to collect relevant information on family size, land holding, cropping pattern, production, farm level retention, marketable surplus, marketed surplus, losses, marketing facilities etc. The primary data relating to market arrival, cost and price spread by different marketing agencies was collected from the year 2011-12.

Marketing cost (assembling, transport, packing, market fees, fooding, labour, loading, unloading, tax, losses) at various level of tomato marketing was calculated serially and the final total marketing cost is estimated. Marketing margin at each stage of marketing is calculated as:

$$Mg = SP - (PP + MC)$$

Where, Mg - Marketing margin of ith middlemen
SP - Sale Price of ith middlemen
PP - Purchase price of ith middlemen
MC - Marketing cost at each stage of marketing

The producer's price is worked out as:

$$PF = SP - MC$$

Where, PF - Producer's price
SP - Sale price of producers
MC - Marketing cost of producers

Producer's share in consumers Rupee is worked out as:

$$PS = (PF \div RP) \times 100$$

Where, PS - Producer's share
RP - Retail price

The marketing efficiency (ME) is worked out applying Shepherd's formula

$$ME = \frac{V}{I} - 1$$

Where, V- Value of goods sold (in consumers' rupee)
I- Total Marketing Cost

V.   RESULTS AND DISCUSSION

1.   Production, farm retention and marketed surplus

Marketed surplus may be more, less or equal to marketable surplus because of cash requirement, hoarding or perishable nature. The overall production of tomato was 226.57 quintals (Table 2) of which marketable surplus was 206.69 quintals (91.23%) after retaining 19.85 quintal (8.78%) for family consumption,

religious payment and gift to friends and relatives. Marketed surplus was 196.83 quintal (86.88 %) and losses due to mishandling, breakage and spoilage accounted 4.35 percent of total quantity.

Of the total farm level retention, religious payment has the greater share (78.81%) followed by home consumption (13.21%) and gift (7.98%). The study found out that with increase in farm size increases home consumption decreasing marketable surplus.
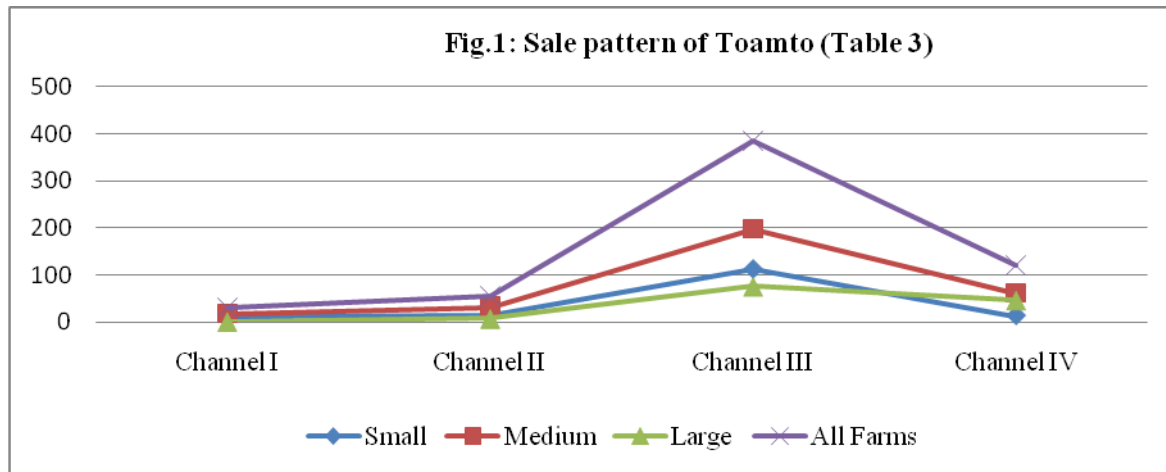
2.   Marketing channel

Marketing channels indicate how market intermediaries are set to accomplish the movement of a product from producer to the final consumer. Four marketing channels were indentified in the study area for marketing of tomato.

Channel I   : producer-consumer
Channel II   : producer-retailer/shopkeeper- consumer
Channel III   : producer-wholesaler-consumer
Channel IV   : producer-local trader-retailer-consumer

Table 3 presents total quantity marketed through the identified marketing channels. It is observed from the table that out of the total quantity of tomato (590.50 quintals) marketed, channel III is the most effective marketing channel for tomato through which small, medium and large farmers marketed 72.91, 63.93 and 58.86 percent respectively
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For all farms, the maximum quantity of tomato was passed through channel III (65.16%) followed by channel IV (20.4%), channel II (9.32%) and channel I (5.08%). The study shows that only the small and medium farmer uses channel I while large farmers do not use marketing channel I; even sale through the retailers was 5.28 percent. Figure 1 depicts sale pattern of tomato.

3.   Marketing Cost

The cost incurred by different marketing intermediaries is given in Table 4. From the table, per quintal marketing cost of tomato incurred by the producer was highest in channel I (Rs. 44.97/quintal) followed by channel II, III and IV. In channel I, producers incurred all the expenses went through streets as vendors and sold the fresh tomato directly to the consumers. Labour is the only cost of producers in this channel. In channel II, 11.40 percent to total cost was incurred by the retailers. In channel III, out of total Rs. 2566.29/quintal, producers percentage cost was 46.98 percent to total while the remaining percent were obtain by wholesalers (53.02%). The symmetrical cost of producers was 15.12 percent in channel IV; retailers (8.04%); local traders (76.84%). Low cost of producers in channel IV is the local traders purchase tomato directly at farm whilst high marketing cost of local traders are their cost on transport, packing, labour, loading, unloading, communication, losses, tax, fees, and other miscellaneous.

4.   Marketing margin and price spread

Price spread is the difference on ultimate price paid by the consumer and the net price received by the producer for an equivalent quantity of farm product. It consists of marketing cost and margins of the

intermediaries that determines the overall effectiveness of marketing system. The producers share in consumers' rupee (Table 5) was highest in channel I (94%) and lowest in channel IV (48.07%). Large percentage share of producer in channel I are the absence of any middlemen between producers and consumers. Next profitable channel of producers for sale of tomato was through retail market (channel II, 72.22%). Producers share is directly related to the number of market intermediaries involved in the marketing of tomato as revealed by the study table.

The net margin of local traders was 23.51 percent (channel IV) while the share of wholesaler in consumers rupee was 21.55 percent (channel III). The local traders have higher margin than the wholesalers. All market activities come to rest with retailers whose share in consumers' rupee was 15.24 percent and 15.64 percent in channel II and IV respectively.
The percentage share of gross marketing margin in consumers rupee was (6%), (27.78%), (43.78%) and (51.93%) respectively in channel I, II, III and IV. The gross marketing margin was recorded the highest in channel IV and lowest in channel I.

5. Marketing efficiency
Marketing efficiency ratio was found to be highest in marketing channel I (Table 6). This high ratio indicates the absence of market middlemen accept the labour cost of the producers. Applying shepherds formula, marketing efficiency in channel I, 15.67; II, 6.97; IV, 6.82; III, 3.49. Channel I is the most efficient marketing channel of tomato while channel II was second most efficient channel. The study depicts that higher marketing margins pocketed by the intermediaries resulted in poor marketing efficiency of tomato.

VI. CONCLUSION AND SUGGESTIONS
The study concludes that small farmers marketed 153.28 quintals (87.09%); medium, 308.92 quintals (86.85%); large, 128.30 quintals (86.69%) of their total marketable surplus. Percentage loss due to breakage and spoilage was high among the large farmers. The study also shows that major portion of marketable surplus was transacted through producer-wholesaler-consumer channel (65.16%). The least was recorded in channel I (5.08%). The highest marketing cost incurred by the producers was in channel I and II while wholesaler (53.02%) and the local traders (76.84%) derive high cost in channel III and IV. The percentage cost of retailers to total were 11.40 percent (channel I) and 8.04 percent (channel II). Producers share in channel I was 94 percent; it was 48.07 percent in channel IV. Low percentage share of producers in channel IV attributes to high net margin of local traders (23.51%). Gross market margin at this channels were 6 percent (channel I) and 51.93 percent (channel IV). Producers share in consumers' rupee decreases as market intermediaries increases. In the marketing of tomato, producer-consumer is the most efficient channel in the study area. Channel III recorded the lowest efficient market. Lower the market efficiency, poorer the marketing system.

Post harvest losses (4.35%) due to poor storage facilities are high in the case of tomato because of its perishabilty. To minimize post-harvest losses, proper storage facilities need to be established in the production area. Wooden/plastic crates at low price will help to reduce packing cost and losses due to mishandling, breakage and squeeze. Daily/weekly regulated local markets near the production area need to be established. Marketing loan, education facilities, roads and transport, soil testing, market information on price and arrival, and measures to prevent pre-harvest losses due to insects/pest and climate may help in increasing marketing efficiency of tomato. High market margin of local traders (23.51%) and wholesaler (21.55%) shows how inefficiency is the marketing of tomato in the study area. This is because of its perishable nature with no better storage infrastructure and market operation on the part of the farmers: a reason of fear that gives advantage to the intermediaries and another reason are lack of/non coordination among the concern farmers. Establishing co-operative societies and collective decision among farmers relating to price and arrival will help reduce the gross market margin of tomato.

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Table 1: Category of Tomato cultivators according to size of holdings

SI. No	Category	No. of cultivators	Holding Size (in Hectares)
1	Small	18	0-2.02
2	Medium	25	2.03-2.83
3	Large	07	2.84-4.05
4	Total	50	-

Source: Based on Field Survey, 2011-12

Table 2: Production, Farm retention and marketed surplus of Tomato (In quintals)

SI. No	Particulars	Small	Medium	Large	Overall
1	Production	176.00 (100.00)	355.70 (100.00)	148.00 (100.00)	226.57 (100.00)
2	Farm retention	16.66 (9.47)	30.98 (8.71)	12.00 (8.11)	19.88 (8.78)
	Home Consumption	2.72 16.33*	4.08 13.17*	1.08 9.00*	2.63 13.21*
	Religious payment**	12.70 76.23*	24.30 78.44*	10.00 83.33*	15.67 78.81*
	Gift	1.24 7.44*	2.60 8.40*	0.92 7.67*	1.59 7.98*
3	Marketable surplus	159.34 (90.53)	324.72 (91.30)	136.00 (91.90)	206.69 (91.23)
4	Losses	6.06 (3.44)	15.80 (4.44)	7.70 (5.20)	9.85 (4.35)
5	Marketed Surplus	153.28 (87.09)	308.92 (86.85)	128.30 (86.69)	196.83 (86.88)

Source: Based on Field Survey, 2011-12

Note: Figure in parentheses is in percentage to total production

    *are in percentage to farm level retention

    **Religious payment is made in the form of tithes and offering to local church. This is both in cash and kind.

Table 3: Marketing channels and sale pattern of Tomato by size group (Quantity in quintals)

Sl. No	Category	Channel				
		Channel I	Channel II	Channel III	Channel IV	Total
1	Small	12.42 (8.10)	15.87 (10.35)	111.76 (72.91)	13.23 (8.63)	153.28 (100.00)
2	Medium	17.56 (5.68)	32.37 (10.48)	197.50 (63.93)	61.49 (19.90)	308.92 (100.00)
3	Large	-	6.78 (5.28)	75.52 (58.86)	46.00 (35.85)	128.30 (100.00)
4	All Farms	29.98 (5.08)	55.02 (9.32)	384.78 (65.16)	120.72 (20.40)	590.50 (100.00)

Source: Based on Field Survey, 2011-12

Figure in parentheses indicates percentage to the Total

Table 4: Marketing Cost met by various intermediaries in the study area (Rs/qtls)

Sl. No	Intermediaries	Marketing Cost			
		Channel I	Channel II	Channel III	Channel IV
1	Producer	44.97 (100.00)	183.42 (88.60)	1205.66 (46.98)	70.00 (15.12)
2	Retailer	-	23.60 (11.40)	-	37.20 (8.04)
3	Wholesaler	-	-	1360.63 (53.02)	-
4	Local Trader	-	-	-	355.68 (76.84)
5	Total Marketing Cost	44.97 (100.00)	207.02 (100.00)	2566.29 (100.00)	462.88 (100.00)

Source: Based on Field Survey, 2011-12
Figure in parentheses indicates percentage to the Total

Table 5: Per quintal Price spread and returns of Tomato obtained through different channels (Rs/qntls)

SI. No	Particulars	Channel I	Channel II	Channel III	Channel IV
1	Net price realized by producers	704.53 (94.00)	1192.08 (72.22)	6489.94 (56.22)	1740.80 (48.07)
2	Net Margin of Retailers	-	251.50 (15.24)	-	566.40 (15.64)
3	Net Margin of Wholesaler	-	-	2487.17 (21.55)	-
4	Net Margin of Local Traders	-	-	-	851.52 (23.51)
5	Total Marketing Cost	44.97 (6.00)	207.02 (12.54)	2566.29 (22.23)	462.88 (12.78)
6	Consumers Rupee	749.50 (100.00)	1650.60 (100.00)	11543.40 (100.00)	3621.60 (100.00)
7	Gross Marketing Margin	44.97 (6.00)	458.52 (27.78)	5053.46 (43.78)	1880.80 (51.93)

Source: Based on Field Survey, 2011-12
Figure in parentheses indicates percentage to consumers' rupee.

Table 6: Marketing Efficiency in Marketing of Tomato

SI. No	Particulars	Marketing Channels			
		Channel I	Channel II	Channel III	Channel IV
1	Value of goods sold (consumers Rs/qntl)	749.50	1650.60	11543.40	3621.60
2	Total Marketing Cost	44.97	207.02	2566.29	462.88
3	Marketing Efficiency	15.67	6.97	3.49	6.82

Source: Compiled by researcher