Economics of High Value Agricultural Commodity Marketing in Garo Hills (MEGHALAYA)

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Abstract

The geographic and climatic conditions of Meghalaya support production of large number of different types of high value agricultural commodities. This can be converted into a high growth industry provided the producers are assured of better supply chains, marketing facilities, and reasonable prices for their produce. However, there are not enough studies available to understand the present situation in the state and plan accordingly. Thus this study tried to identify the supply chains of some the important high value agricultural commodities of Garo hills and estimate the marketed surplus, marketing cost, margins, price spread, and producer's share in consumer rupee and marketing efficiency in these channels. The study specifically focused on small holders. The study identified four supply chains for pineapple, seven supply chains for areca nut and two supply chains for cashew nut in the study area. Based on the responses of producer farmers as well as different chain members, this study finds that the most of the small holders are in disadvantageous position with producers share in consumer rupee found to be as low as 25 percent in some channels. Most of the supply chains are very long with large number of middlemen who take away most of the consumer share. This situation is not very encouraging and can be considered as one of the prime factors affecting the traditional supply chains in hilly areas and poor contribution of agriculture towards economic growth. A proper supply chain strategy with the involvement of local institutions and improvement in rural and agri-infrastructure can be a possible solution.

1. Introduction

The economy of Meghalaya is basically agrarian. The geographic and climatic conditions of the state support production of large number of different types of high value agricultural commodities (HVAC). However, till date there is no uniform pattern in the organisation and management of markets in the state so that agriculture can be boosted. These markets lack the facility of regular and cheap transport and good infrastructure. They also lack basic amenities of godowns or storage facility, proper drainage and pavements, water supply and parking facilities. Commodities coming to the primary markets from the villages are purchased and collected by small traders and are generally taken to the markets at Shillong, Jowai and Tura from where surplus quantities are marketed outside the state (Singh, 1984).

The high value agricultural commodity industry can be immensely expanded provided the producers are assured of better supply chains, marketing facilities, and reasonable prices for their produce. However, poor efficiency in marketing channels of these commodities and inadequate marketing infrastructure are making too little of the consumer's rupee reaching the farmer(Kaul, 1997; Ashturker and Deole, 1985). There is also massive wastage, deterioration in quality as well as frequent mismatch between demand and supply both spatially and over time (Subbanarasiah, 1991; Singh, 1984). In the light of these concerns, this study tries to examine various aspects of the marketing of pineapple, areca nut and cashew nut in Garo hills of Meghalaya. This study has been conducted with the following objectives.

(a) To identify the supply chains of some the important high value agricultural commodities of Garo hills.

(b) To estimate the marketed surplus, marketing cost, margins, price spread, and producer's share in consumer rupee and marketing efficiency in these channels.

2. METHODOLOGY

2.1. Hvap Identification

Smallholders(less than two hectares) cannot sustain livelihoods by growing staple food grains on their meager holdings. However, smallholders can leapfrog from their food grain based systems to high value agriculture to augment their incomes. They have certain advantages, primarily abundant family labour, as most of the high value commodities are labour- intensive. Highvalue commodities, unlike food grains, are mostly perishable and their shelflife is less. Thus, highvalue commodities require fast moving institutions and infrastructure (for example, improved highways, modern airports, and cold chains) to provide ready markets and processing (Joshi *et al*., 2007). But in hilly areas, especially, land-locked hilly areas like Garo hills; the concept of fast moving infrastructure is difficult and costly, if not impossible (BhagatandDhar, 2012a). Under this condition, non-perishable crops like cashewnut and arecanut seem as suitable high value crops of the region and thus were selected for the purpose of the study. But to have an overall understanding, at the same time it is very important to study at least one of the important high value highly perishable agricultural commodities, thus, pineapple was also selected for the purpose of the study. Pineapple had the highest annual production (43720 MT) among important high value agricultural commodities in Garo hills during the study period (BhagatandDhar, 2012b).

2.2. Research Design

2.2.1. Data collection

To achieve the specific objectives of this study, necessary data were collected from smallholder farmers as well as different agencies identified across the supply chains of all the three selected high value agricultural commodities. Data collection was done through personal interviews. Data collection was done during the period of July 2010 to March 2011 in all the three districts of Garo hills (East Garo hills, West Garo hills and South Garo hills).Time series data for different periods were collected from the state level crop reports published by Government of Meghalaya, "Statistical Hand Book of Meghalaya" published by Directorate of Economics and Statistics, Government of Meghalaya and "Basic Statistics of NER" published by North Eastern Council, Shillong. Secondary data were also collected from various websites and report of various committees, etc.

2.2.2. Sampling procedure

The basic criteria considered in selection of smallholder growers were their market orientation or commercial attitude. The growers who produced HVAPs targeting the market were considered as commercial growers and formed part of sample. Smallholder growers, who produce HVAPs mainly for meeting their family needs and only the leftover as surplus for markets, were not selected as samples.

Table 1. Agencies studied in different supply chains

Sl. No.	Agencies	Number of agencies studied		
		Pineapple supply chain	Areca nut supply chain	Cashew nut supply chain
1	Producer	270	270	270
2	Itinerant village trader	NA	32	NA
3	Pre-harvest contractor	10	11	23
4	Commission agent	8	NA	21
5	Wholesaler	17	NA	10
6	Primary market wholesaler cum processor	NA	15	NA
7	Processor	NA	NA	14
8	Terminal market wholesaler cum commission agent	NA	7	NA
9	Distant market wholesaler	NA	9	6
10	Village trader	NA	16	NA
11	Retailer	15	32	9

NA: Not available in the supply chain

Multistage random sampling technique was used to select the commercial HVAPs growers. In the first stage, three development blocks having major commercially HVAPs growing areas in all the three districts of Garo hills were identified in consultation with concerned officers of state agricultural department and crop forecast report of different years. In the second stage, three villages in each block having highest commercial HVAP growers were identified in consultation with agricultural extension officers, village level extension officers and village heads in the absence of village level data. In the third stage, small holders going for commercial cultivation in each of the selected villages were listed and 10 farmers from the list were randomly selected. Thus for each HVAP, 270 small holder commercial growers were selected. Finally, to complete the chain and to study the supply chain of HVAPs, the chain members at different level of chain were identified through the method of snow ball (a method by which advices were followed from the actors in the chain in finding other actors in the chain and finally completing it). The different agencies surveyed in the study are shown inTable 1.

2.2.3. Supply chain analysis

The analysis of the supply chains of selected high value agricultural commodities wasdone on the basis of marketed surplus, marketing cost, marketing margin, producer's share in consumer's rupee and marketing efficiency by using the concepts and formulas given by Acharya and Agarwal (2004).

(a) Marketing cost

The marketing cost was estimated as:

$C = C_F + C_{m1} + C_{m2} + C_{m3} + \ldots\ldots\ldots\ldots + C_{mn}$

where

C = Total cost of marketing of high value agricultural commodities

C_F = Cost paid by the producer- farmer (viz. grading and cleaning, transportation, loading and unloading, storage, market fee etc).

C_{mi} = Cost incurred by the i^{th} middleman in the process of marketing of these commodities. The various cost components are grading and cleaning, counting, transportation, loading and unloading, storage, market fee, processing (if any), packaging etc.

In case of pineapple the cost was expressed as rupees per hundred pineapples while in case of areca nut and cashew nut cost was expressed as rupees per quintal.

(b) Marketing margin

For all the three high value agricultural commodities under study, the marketing margin at any stages of marketing was calculated as follows:

$MM_i = SP_i - (PP_i + MC_i)$

where

MM_i= Marketing margin of the i^{th} middleman

SP_i= Selling price of i^{th} middleman

PP_i= Purchase price of the i^{th}middlemn

MC_i = Marketing cost incurred by i^{th} middleman

After calculating the marketing margins at different stages, finally the total marketing margin were estimated.

(c) Producer's share in consumer's rupee

The producers share in consumer's rupee for all the three selected high value agricultural commodities was worked by the following method:

$P_S = (P_F/Pr)*100$

where

P_S = producer's share in consumer's rupee (%)

P_F = producer's price (Rupees per 100 nos. for pineapple and Rs/qt for areca nut and cashew nut)

Pr = price paid by the consumers (Rupees per 100 nos. for pineapple and Rs/qt for areca nut and cashew nut)

(d) Marketing efficiency

The marketing efficiency of different channels of marketing of pineapple, areca nut and cashew nut was estimated by using the formula mentioned:

ME = FP/ (MC+ MM)

where

ME= Index of marketing efficiency

FP = Price received by the farmer (Rupees per 100 nos. for pineapple and Rs/qt for areca nut and cashew nut)

MC = Total marketing costs (Rupees per 100 nos. for pineapple and Rs/qt for areca nut and cashew nut)

Table 2. Profile of respondents

Sl. No	Particulars	Pineapple farmers	Areca nut farmers	Cashew nut farmers
1	No. of farmers	270	270	270
2	Average area (Acre)	2.83	3.85	3.65
3	Average marketed surplus per farmer	6107.83 no's	2762.10 kg	1869.56 kg
4	Age (years)	46.1	47.4	47.2
5	Family size	6.86	5.12	4.89
6	Education level	9.24	7.04	7.78

Table3. Marketing channels of pineapple in Garo hills

Channel no.	Channels	Percent of quantity transacted
1	Producer – Retailer – Consumer	11.28
2	Producer – Wholesaler - Retailer – Consumer	61.83
3	Producer – Pre harvest contractor - Wholesaler - Retailer – Consumer	16.99
4	Producer – Commission agent - Wholesaler - Retailer – Consumer	9.90

MM = Net marketing margins (Rupees per 100 nos. for pineapple and Rs/qt for areca nut and cashew nut)

3. Results and Discussion

3.1. Profile of the Respondents

Brief descriptions of the respondents are presented in Table 2. In total 270 farmers formed the sample of this study for each high value agricultural commodity. The average area per farmer under pineapple cultivation was found to be 2.83 acre. The same was 3.85 and 3.65 under areca nut and cashew nut cultivation.

In case of pineapple the average marketed surplus was 6170.83 numbers. The marketed surplus in areca nut was found to be 2762.10 kg/farmer and for cashew nut it was 1869.56 kg/farmer. It was also observed from the table that younger group of farmers are engaged in pineapple cultivation whereas the middle age farmers are engaged in areca nut and cashew nut cultivation. The average education was found to be higher in case of pineapple farmers then areca nut and cashew nut. In case of pineapple the average family size was 6.86, in case of areca nut the average family size was 5.12 and for cashew nut it was 4.89. Apart from the smallholder producer farmers, view of other stakeholders wasalso taken for the study.

3.2. Pineapple Supply Chain

Pineapple is one of the important commercial fruit crops of Meghalaya in general and Garo hills in particular. Pineapple has huge processing opportunity also. Four major marketing channels of pineapple involving smallholders were identified in Garo hills of Meghalaya (Table3).

The various agencies involved in each channel are shown in Table 3. Maximum transaction was found to be through channel no. 2 (around 62 percent). However, minimum transaction was found to be through channel no. 4 (only 10 percent).

3.3. Areca Nut Supply Chain

In Garo hills areca nut is one of the important commercial plantation crops grown in small homestead gardens as a mixed crop with coconut, banana, lemon etc. as well on large orchards as pure crop. It is marketed in the form of raw, preserved nuts, and dried *supari*. The raw and underground preserved nuts were sold in the market in "poands" or "cowns". Eighty whole nuts forms one "poand"and twenty such "poands" are equivalent to one "cown". However, the processed areca nuts were sold in kilograms and quintals.Though there is no official yardstick to measure, experienced people (farmer and trader) opined that at tender stage one 'cown' weight about 18 to 22 kilogram. The transportation of areca nut at the producing areas was done in the bags (gunny bags) by head load and shoulder load in hilly areas and in by bicycle and push cart in plain areas. Roughly, one bag was equivalent to 35 poands of 1.5 cown or about 0.39 quintals (Similar findings were reported by other researchers regarding neighboring areas like Goalpara, Assam etc.).

Table4. Marketing channels of areca nut in Garo hills

Channel no.	Channels	Percent of quantity transacted
	Raw Nuts	
1	Producer- Itinerant village trader- Primary market wholesaler cum processor- Distant market wholesaler- Retailer – Consumer	37.32
2	Producer- Primary market wholesaler cum processor- Distant market wholesaler- Retailer – Consumer	9.72
3	Producer- Itinerant village trader- Primary market wholesaler cum processor- Terminal market wholesaler- Distant market wholesaler- Retailer – Consumer	9.51
	Mature Nuts	
4	Producer- Itinerant village trader- Terminal market wholesaler cum commission agent- Distant market wholesaler- Retailer – Consumer	11.34
5	Producer-Pre harvest contractor- Terminal market wholesaler cum commission agent- Distant market wholesaler- Retailer – Consumer	5.51
	Dry and Gora Nuts	
6	Producer- Terminal market wholesaler cum commission agent- Distant market wholesaler- Retailer – Consumer	6.80
7	Producer-Village trader- Retailer – Consumer	19.80

The institutions/agencies involved for areca nut were the itinerant village traders, primary market wholesalers cum processors, pre- harvest contractors, terminal market wholesalers, distant market wholesalers, village traders and retailers (Table 4).The marketing channels in areca nut can be classified into three categories- marketing channels for raw nuts (around 57 percent areca nut transacted at raw stage), marketing channels for mature nuts (around 17 percent areca nut transacted at mature stage), and marketing channels for dry and gora nuts (around 26 percent areca nut transacted). Maximum quantity of transaction was done for raw nuts and maximum transaction was done through channel no. 1. Around 20 percent of transaction was done through channel no. 7 (through this channel dry and gora nuts are transacted).

3.4. Cashew Nut Supply Chain

Cashew was originally introduced into India by the Portuguese during the 16th century. Cashew nuts are also abundantly available in Garo hills of Meghalaya. Most of the cashew processing is being done in Phulbari and Mancachar. The cashew nut processing units in the region has processing capacity ranging from 700 kg to 1 ton a day. It is a labour-intensive industry with every factory having 200-300 labourers, mostly women. Three main qualities of cashew nuts are available in the market of Garo hills. The quality is adjudged according to a code. These are:

Best quality (Code=6 J) @ Rs. 440/- per kg.

Medium quality (Code=4 J) @ Rs. 420/- per kg.

Low quality (Code=1 J) @ Rs. 360/- per kg.

The Department of Co-operation, Govt. of Meghalaya has the Garo Hills' Cotton and Ginning Oil Mills Ltd at Phulbari under the Co-operative sector. Also, there are private player in the field, the largest one being B.R. Industries, Phulbari and having the maximum market share in Tura market.The study identified two major marketing channels in Garo hills of Meghalaya (Table 5). Around 72 percent of cashew nut was found to be transacted through channel one and around 28 percent was found to be transacted through channel two.

3.5. Comparative Analysis of the Supply Chains of the Selected High Value Agricultural Commodities

In this section, supply chains of all the three high value agricultural commodities studied were compared across five key dimensions- total marketing cost, total marketing margin of intermediaries, price spread, producers share in consumer rupee (%) and marketing efficiency (Table 6).

In total four supply chains were identified for pineapple, seven supply chains were identified for areca nut and only two supply chains were identified for cashew nut in the study area. The highest marketing cost was found

Table 5. Marketing Channels of Cashew Nut in Garo Hills

Channel no.	Channels	Percent of quantity transacted
1	Producer- Pre harvest contractor- Whole seller- Processor - Distant market wholesaler - Retailer- Consumer	72.17
2	Producer – Commission agent - Whole seller- Processor - Distant market wholesaler - Retailer- Consumer	27.83

Table 6. Comparative Analysis of the Supply Chains of the Selected High Value Agricultural Commodities Over Key Parameters

Sl. No.	Key parameters	Pineapple supply chains				Areca nut supply chains							Cashew nut supply chains	
	Channels	PSC-1	PSC-2	PSC-3	PSC-4	ASC-1	ASC-2	ASC-3	ASC-4	ASC-5	ASC-6	ASC-7	CSC-1	CSC-2
1	Total marketing cost	164.77	221.36	258.48	199.78	331.58	331.59	366.05	102.44	308.208	84.67	65.87	1408.58	1339.16
2	Total marketing margin of intermediaries	138.79	257.32	291.52	239.05	658.82	530.22	636.72	543.26	1009.92	1780.19	883.25	2588.82	2178.22
3	Price spread	303.56	478.68	550.00	438.83	990.40	861.81	1002.77	645.70	1318.13	1864.86	949.13	3997.40	3517.38
4	Producers share in consumer rupee (%)	64.29	50.00	38.89	53.05	50.90	57.98	50.53	65.01	25.09	63.99	73.72	50.88	58.80
5	Marketing efficiency	1.48	0.89	0.64	0.99	1.01	1.32	0.99	1.79	0.33	1.74	2.71	1.04	1.36

to be incurred in all the supply chains of cashew nuts with channel no. 1 of cashew nut having the highest total marketing cost (Rs. 1408.58). And the lowest marketing cost was found to be in case of channel no. 7 of areca nut with total marketing cost as Rs 65.87.

where

PSC: Pineapple supply chain; ASC: Areca nut supply chain; CSC: Cashew nut supply chain

and

PSC-1: Producer – Retailer – Consumer

PSC-2: Producer – Wholesaler - Retailer – Consumer

PSC-3: Producer – Pre harvest Contractor - Wholesaler - Retailer – Consumer

PSC-4: Producer – Commission Agent - Wholesaler - Retailer – Consumer

ASC-1: Producer- Itinerant village trader- Primary market wholesaler cum processor- Distant market wholesaler- Retailer – Consumer

ASC-2: Producer- Primary market wholesaler cum processor- Distant market wholesaler- Retailer – Consumer

ASC-3: Producer- Itinerant village trader- Primary market wholesaler cum processor- Terminal market wholesaler- Distant market wholesaler- Retailer – Consumer

ASC-4: Producer- Itinerant village trader- Terminal market wholesaler cum commission agent- Distant market wholesaler- Retailer – Consumer

ASC-5: Producer-Pre harvest contractor- Terminal market wholesaler cum commission agent- Distant market wholesaler- Retailer – Consumer

ASC-6: Producer- Terminal market wholesaler cum commission agent- Distant market wholesaler- Retailer – Consumer

ASC-7: Producer-Village trader- Retailer – Consumer

CSC-1: Producer- Pre harvest contractor- Whole seller- Processor - Distant market wholesaler - Retailer- Consumer

CSC-2: Producer – Commission agent - Whole seller- Processor - Distant market wholesaler - Retailer- Consumer

The highest total marketing margin of intermediaries was found to be incurred in all the supply chains of cashew nuts with channel no. 1 of cashew nut showing the highest total marketing margin of intermediaries as Rs 2588.82.

And the lowest total marketing margin of intermediaries was found to be in case of channel no. 1 of pineapple with total marketing margin of intermediaries estimated at Rs 138.79.

Highest price spread was found in channel no. 1 of cashew nut (Rs 3997.40). The lowest price spread was found in channel no. 1 of pineapple (Rs 303.56). An analysis of producers share in consumer rupee shows that in channel no. 7 of areca nut farmers have received highest share of consumer rupee with producers share in consumer rupee found to be 73.72 percent. In channel no. 5 of areca nut, the producers share in consumer rupee was found to be lowest (25.09%).

Finally, the table shows that most efficient channel was found to be channel no. 7 of areca nut with marketing efficiency of 2.71 percent. And channel no. 5 of areca nut was found to be most inefficient supply chain with marketing efficiency of 0.33 percent.

4. Conclusion

In an attempt to study the economics of supply chains of high value agriculture commodities in Garo hills of Meghalaya, this study identified four supply chains for pineapple, seven supply chains for areca nut and two supply chains for cashew nut.The small holders are in disadvantageous position with producers share in consumer rupee found to be as low as 25 percent in some channels. Most of the supply chains are very long with large number of middlemen who take away most of the consumer share. All this leads to inefficient supply chains and poor contribution of agriculture towards economic growth. A proper supply chain strategy with the involvement of local institutions and improvement in rural and agri-infrastructure can be a possible solution.

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