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Viable market linkage of rice in sub-tropical hill agro climatic zone of Meghalaya: An empirical analysis

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Abstract

Rice holds immense significance as the primary cereal crop and a way of life for the people of Meghalaya state. Despite its importance, rice has not received proper recognition for sale in regulated markets within the region. The establishment of regulated markets is influenced by factors such as producer surplus. Hence, the study was focused on viable market linkage of rice in the sub-tropical hill agro-climatic zone of Meghalaya by selecting 60 farmers and 13 intermediates of the market. Surprisingly, a considerable quantity of rice is being sold through unorganized markets, leading to a higher volume of rice being retained within households. Initially different (four) channels were identified for disposal pattern of rice. Highest price spread (1100₹/quintals) and marketing efficiency (4.00%) was found in channel-I (Producer- Village Merchant – Retailer-Consumer), lowest price spread (476.76/quintal) and marketing efficiency (10.906%) were found in channel IV (Producer-Consumer). To enhance the marketing of rice, there is a need to promote the popular channel of selling rice from producer to consumer, emphasizing the benefits it brings to rice growers.

Keywords: Producer surplus, market linkage, disposal pattern, rice, Meghalaya

1. Introduction

Rice stands as the primary and pivotal cereal crop for the inhabitants of the North Eastern Hill (NEH) region in India, encompassing seven states: Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, and Sikkim. The region is engaged in sustained efforts to achieve self-sufficiency and security in food supply. Among these states, Meghalaya emerges as an agrarian hub. Within Meghalaya, rice cultivation spans both hilly terrains and plains, forming the cornerstone of agriculture and related endeavours. The cultivation of rice and its associated activities form the predominant means of sustenance for the rural populace, serving as the cornerstone of the state's economy. The agricultural sector significantly contributes to the overall state domestic product and employs a substantial portion of the workforce in Meghalaya. Notably, rice holds a vital position as the principal food crop in Meghalaya, occupying an average yearly cultivation area of 110,997 hectares and yielding a combined output of 303,476 Metric Tons^[1].

The execution of Minimum Support Price (MSP) regulations within the state falls under the jurisdiction of the State Agricultural Marketing Board. Consequently, despite rice's prominence as a key crop in the state, it has not gained formal acknowledgement for inclusion in the Agricultural Produce Market Committee (APMC) framework. Nonetheless, a thorough examination of the underlying causes must be conducted at the grassroots level, specifically within farmers' fields.

The establishment of marketing mechanisms and the enhancement of market networks should exclusively target the surplus quantity of produce available from farmers, rather than encompassing the entire production output. The rate at which agricultural production expands plays a pivotal role in dictating the trajectory of agricultural progress, whereas the growth in marketable surplus assumes significance as a catalyst for the country's economic advancement^[2].

While the marketing system primarily focuses on the surplus that enters or is anticipated to enter the market, the overall quantity of total production remains a crucial determinant for this surplus.

The relationship is straightforward: A higher production of a given commodity leads to a larger surplus, and conversely, a lower production results in a smaller surplus [3]. Understanding both the marketed surplus and the potential marketable surplus provides valuable insights for policymakers and traders alike. This knowledge aids in formulating effective pricing policies, establishing robust procurement practices, developing efficient transportation and storage infrastructures, and enhancing market and market yard facilities. Considering the aforementioned context, the current study has been designed to calculate the producers' surplus of rice.

The study findings have brought to light that rice crop cultivation in the examined region remains primarily oriented towards subsistence agriculture. To transition this cultivation into a commercial endeavour, there is a pressing requirement for scientific interventions, specifically the implementation of site-specific high-yielding varieties, optimized sowing techniques, and improved irrigation methods. The prevalent subsistence-level approach to rice production contributes to the retention of a significant marketable surplus, and the absence of an organized market exacerbates this issue.

Therefore, a crucial step forward involves the establishment of a regulated market at the block level within the study area. This becomes imperative in light of the current circumstances. Notably, the dominant pathway for rice distribution in the area involves processing from producers to consumers. This channel should be bolstered through the adoption of novel processing technologies. The reinforcement of processing capabilities in the region will not only incentivize farmers to increase their rice production but also play a pivotal role in fostering the growth of an organized market. In essence, transforming rice cultivation from subsistence to commercial, instituting a regulated market at the block level, and enhancing processing technologies collectively contribute to a comprehensive strategy for advancing the agricultural landscape and promoting economic development in the area.

2. Methodology

Meghalaya is located within the Eastern Himalaya Zone-II, which is further sub-divided into five sub-regions, taking into consideration of topography, rainfall, temperature, soil type and cropping system. For the purpose of planning for development, research and extension, the state has been divided into three Agro-Climatic Zones (ACZs). They are namely Tropical zone (100-300 mMSL), Sub-tropical zone (300-1100mMSL) and Temperate zone (1100-2000m MSL) [4]. Description of ACZs of Ri-Bhoi district (5) is mentioned in the following Table # 1.

Table 1: Agro-Climatic Zones of Ri-Bhoi district of Meghalaya

S. No.	Agro-climatic Zone	Characteristics
1	Subtropical hill zone	400-1200m MSL, Temperature: 32 °C-12 °C, All area of Ri-Bhoi district except southern part
2	Mild tropical hill zone	200-800m MSL, Temperature: 30-12 °C, Southern part of Ri-Bhoi district

2.1 Sampling Procedure

2.1.1 Selection agro climatic zone

Sub-tropical hill agro climatic zone of Meghalaya was selected purposively based on the criteria of paddy is grown largely in the sub-tropical hill ACZ of the state Meghalaya. The research project DHaBReT has intervened in this particular ACZ on the crop paddy.

2.1.2 Selection of villages

Three (3) villages, namely (i) Thadnongjiew (ii) Liarkhla (iii) Kudungulu which are in the Sub-Tropical Hill ACZs of Meghalaya at Bhoirymbong C & RD Block, Ri-Bhoi district under the with IIDS in Providing Evidence-Based Agro-Advisory Services to Farmers of North-East India” A.K.A DHaBReT selected purposively.

2.1.3 Selection of Respondents

A total of 60 farmers were selected purposively based on the criteria of farmers having paddy agro-forestry lands and have a consolidated area of not less than 01 ha and also the prevalent actors involved in the chains were mostly Village Merchant (6), processors (3) and Retailers (4), consumers in marketing of the produce from farmers to the end user i.e. consumers. Both primary and secondary data were collected. Primary household data were collected using the pretested well-structured schedule during the crop year of 2022-2023.

3. Analytical Tools

The producer's surplus was estimated by using standard techniques. The producer surplus is the quantity of produce which is or can be, made available by the farmer to the non-farm population. It is two types viz, marketable surplus and marketed surplus.

3.1 Marketable surplus

The marketable surplus is the residual left with the producer-farmer after meeting his requirement for family consumption, farm needs for seeds and feed for cattle/livestock, payment to labour in kind, payment to artisan, blacksmith, potter and mechanic payment to the landlord as rent, and social and religious payment in kind. This may be expressed as

$$M_s = T_p - (C_n + C_k)$$

Where,

M_s = Marketable surplus

T_p = total production

(It is worked out after deducting the decayed, spoiled or diseased produce)

C_n = Home consumption

C_k = Gifts and kind payments

3.2 Marketed surplus

Quantity of produce which producer- farmer actually sells in the market, irrespective of his requirement for family consumption, farm needs and other payments. The marketed surplus may be more, less or equal to the marketable surplus. It can be worked out as

$$M_t = M_s - (L_m - L_t)$$

Where M_t = Marketed surplus

M_s = Marketable surplus

L_m = Losses during transportation and marketing

L_t = Arbitrary deduction or under weighing by traders at market

3.2 Utility of measurement of marketed and marketable surplus

The marketed surplus may be more, less or equal to the marketable surplus, depending upon the condition of the farmer and the crop. The relationship between the terms is

power of the rice growers which has the following implications:

$$\begin{matrix} > \\ \text{Marketed surplus} = \text{Marketable surplus} \\ < \end{matrix}$$

- The marketed surplus more than marketable surplus on small and marginal Farm.
- Marketed surplus less than marketable surplus on large farm due to better retention power.
- Option of substitute crop for livestock.
- It is equal for perishable commodity; neither retains more nor less than his requirement.

4. Results and Discussion

4.1 Disposal pattern of rice

The Table 2 showcases the disposal pattern of Rice through four distinct distribution channels. In Channel-I, which accounts for 22.86% of the distribution, rice moves from the producer to the village merchant, then to the retailer and finally reaches the end consumer. Channel -II, the most significant distribution route at 33.69%, involves rice being

transferred from the producer to a processor, an intermediary entity that prepares the rice for consumption, before reaching the end consumer.

Table 2: Disposal pattern of rice

Channel name		Percentage (%)
Channel-I	Producer-Village-Merchant-Retailer-Consumer	22.86
Channel-II	Producer-Processor-Consumer	33.69
Channel-III	Producer-Retailer- Consumer	24.78
Channel-IV	Producer-Consumer	18.67

Channel -III represents 24.78% of the distribution, where ginger is passed from the producer to the retailer, eventually reaching the end consumer. Channel -IV, comprising 18.67%, sees ginger directly transferred from the producer to the end consumer. In summary, the table presents a comprehensive picture of how rice is distributed through different pathways, involving various intermediaries and direct transfers before reaching its ultimate consumers.

4.2 Marketable and marketed surplus of rice

Table 3: Marketable and marketed surplus of rice

Particulars	Category of Rice farm			Overall
	Small	Medium	Large	
Rice production	1168.68(100.00)	1823.47(100.00)	4127.67(100.00)	1803.4(100.00)
Rice Retained				
Home consumption	763.22(65.37)	967.65(53.07)	1234.56(29.91)	920.47(51.05)
Seed	60.89(5.21)	120.56(6.61)	150.67(3.65)	80.7(4.47)
Cattle feed	10.23(0.88)	15.78(0.87)	-	12.005(0.67)
Pig feed	186.22(15.94)	321.89(17.68)	643.98(15.60)	322.77(17.90)
Poultry feed	8.77(0.75)	6.78(0.37)	12.45(0.30)	8.62(0.48)
Wages in kind	10.21(0.87)	150.35(8.25)	564.67(13.68)	110.67(6.13)
Relative	49.32(4.22)	41.63(2.28)	120.67(2.92)	56.89(3.15)
Total	1039.54(88.94)	1583.01(86.83)	2606.33(63.13)	1512.12(83.84)
Marketable surplus	79.82(6.83)	199.01(10.92)	1400.67(33.91)	291.28(16.13)
Marketed surplus	78.68(6.74)	196.56(10.77)	1388.31(33.63)	287.83(15.95)
Producers' surplus	158.5(13.57)	395.57(21.70)	2788.98(67.54)	579.11(32.09)

Note: Figures in parentheses indicate percentages to the total.

Inferring the data of Table 3 w.r.t. the marketable and marketed surplus for rice can be pictured very clearly. All three categories of farmers (small, medium, large) had retained rice for various purposes as seed, feed, wages in kind, home consumption and for relatives. On the other hand, marketed surplus indicates the final quantity of the produce that the producer actually sold in the market.

In the small farmers' category, the production was 1168.68 and the marketable surplus, after retaining for various needs, was only 79.82. The highest retention was for home consumption (65.37%) followed by pig feed (15.94%) and the least amount was retained for feeding the poultry (0.75%). The marketed surplus of this category was 78.68.

The medium farmers' category depicts their total production at 1823.47 of which the marketable surplus was only 199.01. In this category, the highest retention was again for home consumption (53.07%) followed by feed for pig (17.68%) and the least was for poultry feed (0.37%) as similar to that of the small farmer category. Finally, the marketed surplus for medium farmers was enumerated be at 196.56.

Similar trend can be seen in large farmers' category, where the total production was 4127.67. Among the marketable surplus of 1400.67, the highest quantity was retained for

home consumption (29.91%) followed by pig feed (15.60%) and wages in kind (13.68%). The actual quantity that large farmers could sell in the market was found out to be 1388.31. On the whole, it was observed that the retention of the produce was the highest for home consumption (51.05%) followed by feed for piggery (17.90%) and the least quantity was retained for feeding the poultry (0.48%). However, the comparison of the three categories reveals that small farmers retain more quantity of rice for home consumption (65.37%) and the large farmers retain the least (29.91%). However, the retention of rice for pig feed was the highest in medium farmers' category (17.68%). Additionally, the marketed and marketable surplus was also seen to be the highest in large farmers' category (33.91% and 33.63%) owing to the increased and production as that of the small and medium farmers. Finally, the producer surplus was enumerated to be 158.5, 395.57 and 2788.98 for small, medium and large farmers, respectively, with large farmers having more producer surplus (67.54%).

4.3 Marketing cost, margin and price spread of rice

Citing the data Table 4 in Channel I, the produce was directly purchased by the village merchants where the total cost

incurred for transportation, loading, etc. were ₹228.76. The produce was then bought by the retailer at ₹4700 which gave a margin of ₹71.24 for the village merchant. Finally, the retailer sold the produce to the consumer for which the marketing cost was ₹426.75 and margin for the retailer was

₹373.24. In Channel II, the producer sells the produce to the processor or miller at ₹4500, who incurred a cost of ₹449.76. The processed product is finally sold to the consumer by the processor by which he obtained a margin of ₹250.24.

Table 4: Marketing cost, Margin and Price spread of Rice (₹/qt)

Particular	Channel I	Channel II	Channel -III	Channel IV
Producer				
a) Transportation	-	-	-	70.00(14.67)
b) Loading & unloading	-	-	-	50.00(10.49)
c) Gunny Bags	-	-	-	76.56(16.05)
d) Stretching	-	-	-	15.20(3.19)
e) Processing	-	-	-	200.00(41.96)
f) Loss during processing	-	-	-	68.00(14.24)
Total marketing cost incurred				476.76(100.00)
Selling price of producer	4400	4500	4600	5200
Net price received by producer				4723.24
Village Merchant				
Particular	Channel I	Channel II	Channel -III	Channel IV
a) Transportation	80.00(34.97)	-	-	-
b) Loading & unloading	60.00(26.22)	-	-	-
c) Gunny Bags	76.56(33.47)	-	-	-
d) Stretching	12.20(5.34)	-	-	-
e) Processing	-	-	-	-
Total marketing cost incurred	228.76(100.00)	-	-	-
Selling price of producer	4700	-	-	-
Village Merchant's margin	71.24	-	-	-
Processor/Miller				
Particular	Channel-I	Channel-II	Channel-III	Channel-IV
Transportation	-	70.00(15.57)		
Loading & unloading	-	50.00(11.12)		
Gunny Bags	-	76.56(17.03)		
Stretching	-	15.20(3.38)		
Processing		180.00(40.02)		
Loss during processing		58.00(12.91)		
Total marketing cost incurred		449.76(100.00)		
Selling price of producer		5200		
Processor's margin		250.24		
Retailer				
Particular	Channel-I	Channel-II	Channel-III	Channel-IV
Transportation	40.00(9.36)		80.00(16.10)	
Loading & unloading	30.00(7.03)		60.00(12.07)	
Gunny Bags	76.56(17.94)		76.56(15.41)	
Stretching	12.20(2.86)		12.20(2.46)	
Processing	300.00(70.33%)		300.00(60.34)	
Loss during processing	68.00(15.94)		68.00(13.63)	
Total marketing cost incurred	426.76(100.00)		496.76(100.00)	
Selling price of	5500		5500	
Retailer's margin	373.24		403.24	
Price Spread	1100	700	900	476.76
Marketing Efficiency	4.00%	6.42%	5.11%	10.906%

Note: Figures in the parenthesis are percentages to the total cost of respective actors along the chains

Channel III involved the retailer as the only intermediary as he procured directly from the producer. The producer sold at ₹4600 to the retailer which he directly sold to the consumer at ₹5500. The cost of marketing the produce for the retailer was at ₹496.76 which led to a margin of ₹403.24 for the retailer. Finally Channel-IV depicts that there were no intermediaries and the producer directly sold the produce to the consumer. The cost of marketing for the producer was ₹476.76 and the consumer paid a price of ₹5200. The net price brought to the producer through this channel was ₹4723.24. The price spread for channels I, II, III and IV were ₹1100, ₹700, ₹900 and ₹476.76, respectively. The price spread was the highest in channel I as there were two intermediaries, followed by channel III because in this channel retailer would

have charged a higher price from the consumer for the produce. However, the channel-IV was depicted as the efficient channel for marketing due to the absence of intermediaries and the channel-I was the least efficient as village merchants and retailers were involved in marketing the produce.

5. Conclusion

The study findings underscore the subsistence nature of rice cultivation in the study area, necessitating a shift towards commercialization through targeted scientific interventions like specialized high-yielding varieties and improved cultivation techniques. The surplus retention due to subsistence practices and the lack of an organized market

highlight the urgency of establishing a regulated market at the block level. Facilitating direct rice flow from producer to consumer through enhanced processing emerges as a promising market linkage. Strengthening processing capabilities not only encourages increased rice production but also fosters the growth of an organized market, contributing to a comprehensive strategy for agricultural advancement and economic development.

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