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Value chain analysis of custard apple in Kanker district of Chhattisgarh

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Abstract

Custard apple is one of the wildy found highly perishable fruit of forest areas. Chhattisgarh is one of the top ten custard apple growing states in our country. The present study was carried out to analyse Value Chain Analysis of Custard Apple in Kanker District of Chhattisgarh. Kanker, Charama and Narharpur blocks of Kanker District. Six Self-Help Groups (SHG's) were engaged in custard apple collection and processing. From each block two SHG's were selected and total 89 respondents were selected by using random sampling technique. The study is based on primary and secondary data. It was found that the marketing Channel – I having the least marketing efficiency i.e. 2.33, marketing efficiency of Channel – II was found to be 20.69 and Channel – III having marketing efficiency of 11.48. The major constraint in value chain analysis of custard apple was enhancing market linkages and shortage of storage facilities. In view of constraints following recommendations were required such as facilitate participation in trade fairs, exhibitions, and market linkages programs to showcase SHGs' products and expand their customer base and Seek partnerships with government agencies, cooperatives, or private entities to establish or improve storage facilities.

Keywords: Value chain, marketing efficiency, custard apple and processing

Introduction

The custard apple value chain in the Kanker District involves various actors and functions to ensure the movement of the fruit from the tribes who collect it to the ultimate consumers. However, traditional practices initially led to significant fruit loss due to lack of market linkages, short shelf life, high perishability, and limited preservation and processing technologies. To address these challenges, processing units were established in the tribal areas, and the tribes learned about value addition activities and their benefits. As a result, they started marketing their collected fruit to these units for value addition. The custard apple value chain comprises several activities, and different actors play different roles in the process. Research institutes play a crucial role by providing technology and knowledge related to harvesting, as well as value addition techniques. Their involvement helps improve the efficiency and effectiveness of the custard apple production and processing. Developmental agencies also play a significant role in supporting the value chain. They serve as a connecting link between the tribes and the ultimate consumers. These agencies help in providing markets for the processed pulp produced by the tribes or processing units. By facilitating market access, they contribute to the economic well-being of the tribal communities and ensure a sustainable livelihood for them. Overall, the establishment of processing units and the support provided by research institutes and developmental agencies have enhanced the custard apple value chain in the Kanker District. These interventions have not only reduced fruit loss but also improved market linkages, extended the shelf life of the fruit, and increased the value of the product through processing and value addition.

Objectives

1. To examine the value chain of custard apple.
2. To identify the disposal pattern of value-added product of custard apple.

Methodology

The study was conducted in the Kanker district of Chhattisgarh because custard apple has been identified as a potential product for the district under the "One district-One product" initiative. 3 blocks (Kanker, Charma and Narharpur) were selected purposively for the study based on large number of SHG groups engaged in collection and processing of custard apple. Six Self-

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Help Groups (SHG's) were engaged in custard apple collection and processing. From each block two SHG's were selected and total 89 respondents were selected by using random sampling technique. The data collected was based on primary and secondary data.

Marketing efficiency

“Efficiency in marketing system relates to the amount or cost of inputs required to obtain a given level of output”.

$$\text{Acharya approach} = \frac{FP}{(MC-MM)} * 100$$

Garrett ranking

$$\text{The garret's ranking method} = \frac{R_{ij}-0.5}{N_j} * 100$$

Result and Discussion

1. Value chain analysis of custard apple

The present study involved six collection and processing units that focused on value addition activities for custard apple. These units received technical support and guidance from scientists affiliated with the Department of Agriculture at the College of Agriculture in Kanker. The task of SHG's included extracting pulp from the fruit and storing the pulp under controlled conditions after deep freezing. Deep freezing helps maintain the quality and freshness of the pulp. Once the custard apple was processed, the units concentrated on marketing the extracted pulp to different entities such as ice cream manufacturers or local vendors. This allowed custard apple to reach end consumers in various value-added forms like ice creams, shakes, rabadi (a traditional Indian sweet dish), and more.

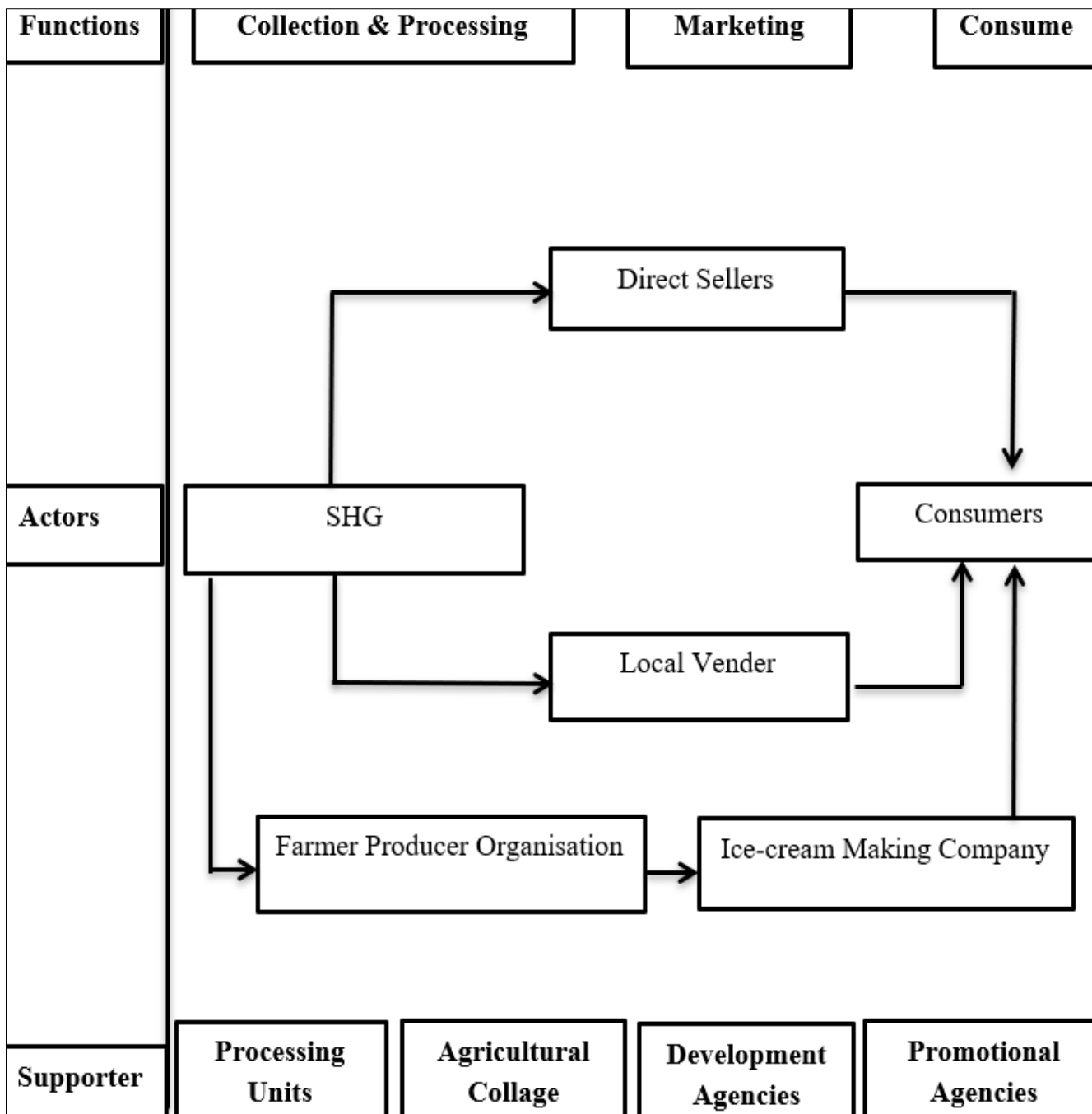
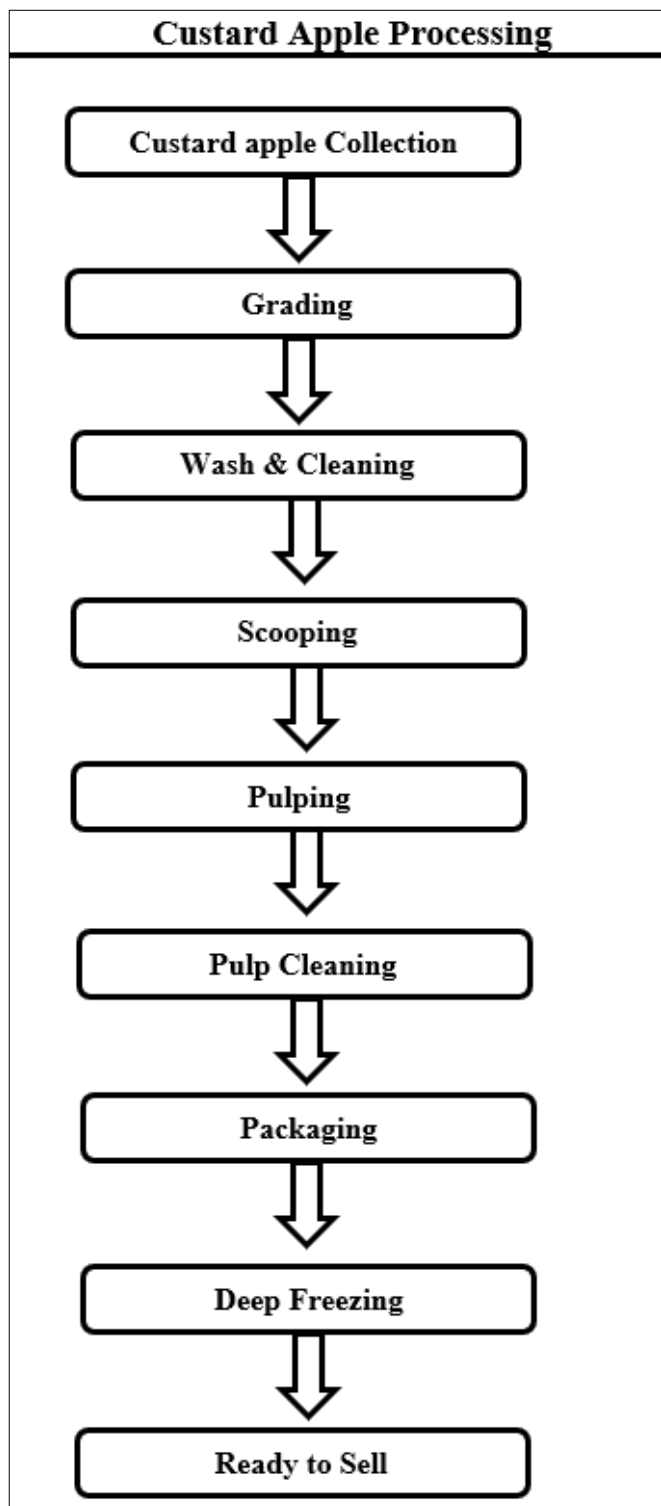


Fig 1: Value Chain Map of Custard Apple in Study Area

1.2 Brief description about Custard Apple Processing

Units: The custard apple processing units involved series of steps in the whole process of extraction and value addition which might be manual or mechanized or combination of both. These steps are as follows:



Custard Apple Processing

The custard apples are subjected to dusting and cleaning processes to remove any unwanted materials, dirt, or debris present on the surface. After washing, they are sun-dried, possibly to remove excess moisture and enhance the shelf life of the fruit. The collected fruits are sorted based on their stage of maturity. Matured fruits are selected for further processing, while unripe fruits are set aside for ripening. The matured custard apples undergo a process called "shopping," which involves removing the seeds and separating the pulp from the peel. The peel obtained from this process is stored separately for later use in converting it into manure. The scooping process is carried out manually, wherein the pulp is carefully extracted from the custard apple. The extracted pulp can be further processed either manually or using mechanized methods to obtain a consistent and homogeneous pulp texture. The obtained custard apple pulp is mixed with preservatives to enhance its shelf life and prevent spoilage. The mixed pulp is packed in suitable packaging, typically in quantities of 1 kg per package. Proper packaging ensures product safety and convenience for consumers. To increase the self-life of the product, the packaged pulp is hardened at a very low temperature of -30°C in a deep freezer. This ultra-low temperature helps in preserving the quality, texture, and flavor of the custard apple pulp. The frozen packaged pulp can be stored for up to 6 months at a temperature of -20°C. This enables its transportation to distant places, ensuring availability of the product in markets far away from the processing location

2. Disposal pattern of value-added product of custard apple.

Channel – I: - SHG's - FPO - Ice cream making company

Channel – II: - SHG's - Consumer

Channel – III: - SHG's - Local vender

Table 1: Disposal pattern of value-added product of custard apple

Particulars	Total custard apple	Channel I	Channel II	Channel III
SHG's	3144.00 kg	685 kg Pulp (65.40)	920 kg fruit (29.26)	56 kg pulp (5.34)

Channel-I (SHG's): This channel contributes 65.40% of the total disposal pattern of custard apple. Self-Help Groups (SHG's) sell the pulp of custard apple to the Farmers' Producer Organization (FPO). Channel-II (Direct Channel or Zero Level Channel): This channel does not involve any market intermediaries. Custard apple from SHG's is sold directly to consumers. Channel-III: This channel contributes 5.34% of the total disposal pattern of custard apple and value-added products of respondents. Further details about Channel-III are not provided. In summary, Channel-I (SHG's selling to FPO) contributes the highest percentage, followed by Channel-II (direct sales to consumers) and Channel-III with the smallest contribution.

2.2 Market cost, market margin, marketing efficiency in the custard apple and value-added product through different channel.

Channel – I: - SHG's - FPO - Ice cream making company

Table 2: Channel-I (SHG's-FPO-Ice cream making company) (Amount in 100kg of fruit)

S. No.	Particulars	Channel I
I	SHG's	Rs/33 kg custard apple pulp
II	Net Price Received by SHG's/ Purchased by FPO	4950.00 (70.03)
III	Cost incurred by FPO	
IV	Storage cost	220.00 (3.11)
V	Transportation cost	450.00 (6.36)
VI	Labour charge	130.00 (1.83)
VII	Sub total	800.00
VIII	Net margin of FPO	1320.00 (18.67)
IX	Sale price of FPO/ Purchase price of Ice Cream company	7070.00 (100)
X	Marketing Efficiency (II/VII+VIII)	2.33

SHG's share was 70.03 percent from the Ice cream making company. Marketing cost incurred by the FPO was Rs.1320.00 per 33kg custard apple pulp and the margin is 18.67 percent of Ice cream making company shares. The various cost incurred in this channel are storage costs of

Rs.220.00 per 33kg, cost on transportation Rs.450.00 per 33kg and labour cost Rs.130 per 33kg. The costing of ice-cream is Rs.7070.00per 33kg custard apple pulp. The marketing efficiency was 2.33.

Channel – II: - SHG's - Consumer

Table 3: Channel-II (SHG's-Consumer) (Amount in 100kg of fruit)

S. No.	Particulars	Channel II
I	SHG's	Rs./quintal of custard apple fruit
II	Net Price Received by SHG's	6000.00 (95.38)
III	Cost incurred by SHG's	
IV	Labour charge	130.00 (2.06)
V	Transportation Cost	110.00 (1.74)
VI	Packaging cost	50.00 (0.79)
VII	Sub total	290.00
VIII	Sale price of SHG's/ Purchase price of consumer	6290.00 (100)
IX	Marketing Efficiency (II/VII)	20.69

SHG's sold their fruits directly to the consumer (nearby city). From the table 3.4.2 in case of SHG's it was seen that a SHG's receives a net price of Rs.6000.00 per quintal of custard apple fruit, which accounts for 95.38% of the consumer's price. The cost incurred by the SHG's in addition

was labour cost Rs.130 per quintal, cost on transportation around Rs.110.00 per quintal and cost on packaging around 50.00 per quintal. The total cost incurred by the producer was Rs.290.00 per quintal of custard apple fruit and having the highest marketing efficiency of 20.69.

Channel – III: - SHG's - Local vender

Table 4: Channel-III (SHG's-Local Vender) (Amount in 100kg of fruit)

S. No.	Particulars	Channel III
I	SHG's	Rs/33 kg custard apple pulp
II	Net Price Received by SHG's/ Purchased by local vender	5280.00 (91.98)
III	Cost incurred by Local vender	
IV	Storage	290.00 (5.05)
V	Transportation cost	60.00 (1.04)
VI	Labour charge	110.00 (1.91)
VII	Sub total	460.00
VIII	Sale price of local vender/ Purchase price of consumer	5740.00 (100)
IX	Marketing Efficiency (II/VII)	11.48

It has been revealed that SHG's receives a net price of Rs.5280.00 per 33 kg custard apple pulp, which accounts for 91.98% of the Local vender. The cost incurred by the SHG's was storage cost Rs.290.00 per quintal, transportation cost

Rs.60.00 per 33 kg custard apple pulp and labour cost Rs.110.00. The total cost incurred by the SHG's was Rs.460.00 per 33 kg custard apple pulp and marketing efficiency of 11.48.

Table 5: Constraints faced by SHG's (No. of Respondent = 89)

Sr. No.	Particulars	Per cent	Rank
1	Enhancing market linkages	95.60	I
2	Infrastructural constraints	39.16	III
3	Socio-cultural barriers	26.66	V
4	Shortage of storage facilities	27.16	IV
5	Lack of transportation with cold storage facilities	85.35	II

It implies that SHGs may struggle to access appropriate markets for their products or face difficulties in effectively marketing and selling their goods or services. Poor infrastructure can hamper communication, and access to essential services, making it challenging for SHGs to carry out their activities efficiently. These barriers may include traditional beliefs, norms, and gender-based discrimination, which can limit the participation and empowerment of certain groups within the SHGs. Socio-cultural barriers, can impact decision-making processes, resource allocation, and overall inclusivity within the SHGs. Insufficient storage facilities lead to product losses, reduced marketability, and limited scope for expanding production.

Suggestion

Facilitate participation in trade fairs, exhibitions, and market linkages programs to showcase SHGs' products and expand their customer base. Seek partnerships with private sector entities or leverage government schemes to address infrastructure gaps. Foster collaborations with local women's groups, NGOs, and social organizations to support SHGs in addressing socio-cultural barriers. Seek partnerships with government agencies, cooperatives, or private entities to establish or improve storage facilities. Collaborate with transportation and logistics companies to improve access to reliable transportation services, especially for perishable products.

Conclusion

Finally, on comparing all three-marketing channel it was found that the marketing channel having less no. of intermediaries has greater marketing efficiency, as it was observed in the channel I, II, III has 2.33 20.69 & 11.48 respectively for SHG's. The increment in SHG's share in consumer's rupee results due to gradual absence of intermediaries in the following marketing channel. The settlement patterns of custard apple are shown in Channel – I, Channel – II and Channel – III respectively.

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