Inclusive Strategy for Small and Marginal Farmers in Tapioca Production, Processing and Marketing

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Abstract

This study was conducted to explore the post-harvest value addition opportunities for tapioca, identify the constraints faced by small and marginal farmers in processing and to suggest a strategy. Primary data from 60 tapioca farmers of Elamadu Grama Panchayath of Kollam district, Kerala were collected through interview schedule. Expert opinion was collected from the Scientists of Kerala Agricultural University (KAU), KVK, and CTCRI etc. to screen the appropriate technology for tapioca value addition. The data obtained were analysed using percentage analysis, SWOC and COWS analysis. It was found that a number of farmers were involved in tapioca cultivation and could produce marketable surplus, but were not engaged in any post-harvest value addition activities. Indeed, farmers have expressed their willingness to start value addition jointly as a group. The technocrats opined that tapioca snacks and chips are better options for value addition at farm level. The study highlighted the need for an exclusive organisation for tapioca cultivation, marketing and processing. Initiating farmer driven producer organisations and consumer linked value chain would be a promising strategy for livelihood of small and marginal farmers of tapioca.

Keywords: Inclusive strategy, production, marketing, tapioca.

Introduction

Tapioca is grown by smallholder farmers in more than 100 tropical and subtropical countries and called "food of the poor" with multipurpose utility. India is the largest producer of Tapioca in Asia with production of 8120000 MT (FAO 2013) during 2012. Major production is reported in South Indian states such as Kerala, Tamil Nadu *etc.* Kollam district of Kerala stands first in Tapioca production accounting for 525486.184 tons (Agricultural Statistics 2010-11). The importance of Tapioca as a food crop is well recognised in Kerala and cultivated extensively. Globally 58 per cent of tapioca produced is used as

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human food, 28 per cent as animal feed, 4 per cent in alcohol and starch based industries and only 10 per cent is spoiled (SIDO online 2001). Seventy per cent of Tapioca produced in the country is used as food either directly or in processed form (NHB, Annual Report 2013-14).

Since the major players in the production of Tapioca are small farmers and 90 per cent of the total produce is available as marketable surplus (FAO 2013), the role played by small and marginal farmers in post-harvest processing is very high. A number of products like chips, wafers, rava, pappads *etc.,* can be made with low financial and technological inputs. Converting harvested Tapioca to products with better storability will help farmers to reduce post-harvest losses and ensure economic returns. The stable quality value added products from Tapioca also open both domestic and export avenues for the products. Despite the good opportunity foreseen, the coordinated efforts in post-harvest activities and stepping to business enterprises among small and marginal farmers are very limited and not encouraging. Keeping the aforesaid discussion points, as a pivotal, this study attempted to answer the following research questions:

1. What are the constraints faced by the small and marginal farmers in production and post-harvest processing of tapioca?
2. Are we having an inclusive strategy for small and marginal farmers for Tapioca production, processing and marketing?

Objectives

Keeping in view the above research questions, the objective of the study is to identify the constraints, faced by small and marginal farmers of tapioca, in production, post-harvest processing and to suggest an inclusive strategy.

Methodology

The study was conducted in Elamadu Panchayath of Kollam District, Kerala. A sample of 60 tapioca farmers was selected using simple random sampling from the sampling frame prepared. Both primary and secondary data were used for this study. The primary data were collected through a structured pretested interview schedule, focused discussion and secondary data were collected from different sources such as print and online publications related to tapioca production and post-production aspects. The experts' opinion was also collected from the Scientists of KAU, KVK, and CTCRI *etc.* and commercial private processors engaged in value addition of tapioca in order to screen out the

appropriate technology. The data obtained were analysed by using percentage analysis, SWOC and COWS analysis. The outcome of the analyses is used for prescribing an inclusive strategy.

Results and Discussion

This section deals with exploration of findings related to key observations *viz.,* ownership and area under cultivation of tapioca, constraints encountered by tapioca farmers in production, post production and value addition, perceived benefits of post-harvest processing and collective marketing and the details are presented in Tables 1 to 6.

Ownership of Land and Area under Tapioca Cultivation

Table 1 shows that 43 per cent of the respondents have an average land holding of below 0.5 acres. Nearly one-third of the respondents (28%) have land holding between 0.5 and 1 acre. Only one-tenth of them (10%) have an average land holding of more than 2 acres. Most of the farmers have their own land for cultivation of tapioca and 10 per cent have taken land on lease. Majority of them (82%) cultivate tapioca in less than 0.5 acre of land. Very few farmers have been cultivating tapioca in 1 to 2 acres of land. From the results obtained, it is inferred that, tapioca cultivation in the study area is scattered and small land holding farmers thus seek out organised cultivation in the study area.

Table 1. Ownership of Land and Area under Cultivation of Tapioca

N = 60

Ownership / Area	Owned	Leased	Percentage	Area under Tapioca cultivation	Percentage
Less than .5 acre	26	0	43.33	49	81.66
.5 to 1 acre	17	0	28.33	9	15.00
1 to 2 acres	7	4	18.30	2	3.33
More than 2 acres	4	2	10.00	0	0
Total	54	6	100.00	60	100

Source: Primary data

Constraints in Production of Tapioca

The various constraints faced in tapioca production as expressed by the farmers are presented in Table 2. The cultivation of tapioca has continued in the study area due to many favourable factors, despite the few constraints. Even if the

available technology is suitable, the prevalence of pests and rodent attack in the field is identified as one of the major problems faced by the farmers (87%). The other major constraints identified are inadequacy of capital (73.33%) and high cost of inputs (53.33%). However, constraints like technology is not adequate and non-availability of inputs are comparatively less expressed. The constraints discussed above are supported by Bahari Yatim (2002), who also reported the same.

Table 2. Constraints in Production of Tapioca

N = 60

Sl. No.	Constraints	SF		SWF		NF	
		Nos.	%	Nos.	%	Nos.	%
1	Inadequacy of capital	44	73.33	14	23.33	2	3.33
2	Irrigation facility is not adequate	29	48.33	16	26.66	15	25.00
3	Pest and rodent attack	52	86.66	8	13.33	0	0.00
4	Technology is not adequate	19	30.00	13	21.66	28	46.66
5	Non Availability of inputs	8	13.33	12	20.00	42	70.00
6	Cost of inputs is high	32	53.33	21	35.00	7	11.66

Source: Primary data Note: SF – Strongly Felt, SWF – Somewhat Felt, NF – Not Felt

Post Production Constraints of Tapioca Farmers

The farmers expressed constraints in the post production process of tapioca and these are listed in Table 3.

Table 3. Post production Constraints

N = 60

Sl. No.	Constraints	SF		SWF		NF	
		Nos.	%	Nos.	%	Nos.	%
1	Inadequate storage facility	27	45.00	17	28.33	16	26.66
2	Low quality of the product	31	51.66	14	23.33	15	25.33
3	Marketing challenges	6	10.00	11	18.33	43	71.66
4	Low prices received	37	61.66	20	33.33	3	5.00
5	Difficulty in Transportation	13	21.66	19	31.66	28	46.66

Source: Primary data Note : SF – Strongly Felt, SWF – Somewhat Felt, NF – Not Felt

The low return of the commodity is always a problem for the farmers and it is reflected in the case of tapioca also. Nearly two-third of the farmers (61.66%) are not satisfied with the price realized for the product and have shown mismatch

between cost of production and price realisation. This calls for establishing price guarding mechanism for tapioca farmers. Table 3 shows that, farmers have been marketing their products through retailers, agents or on their own, which implies that adequate demand existed for the products. Majority of the farmers (72%) expressed that, they didn't face any challenges in marketing due to large industrial demand. Low quality of the product (51.66%) and inadequate storage facilities (45%) were identified as major post-harvest constraints.

Constraints in Value Addition of Tapioca

The farmers in the study are yet to practice post-harvest processing in tapioca and the constraints faced in value addition are given in Table 4. This might be due to lack of knowledge on the value addition process and opportunities. The major constraints identified for post-harvest value addition were unawareness regarding technologies (73.33%), lack of time (60%) and inadequate capital (68.33%). Majority of the respondents (73%) opined that lack of awareness on processing and value addition technology was their major constraint in value addition. Almost half of the respondents (45%) opined uneconomic holding of resources as a constraint for starting a venture in value addition. A similar kind of result was reported by Mohammad Jalal-Ud-Din (2011) such as lack of awareness regarding newer technologies, lack of training and information, inadequate financial resources *etc.* contributing in the process of adoption of technologies.

Table 4. Constraints in Value Addition

N = 60

Sl. No	Constraints	SF		SWF		NF	
		Nos.	%	Nos.	%	Nos.	%
1	Inadequacy of capital	41	68.33	12	20.00	7	11.66
2	Fear of loss	24	40.00	17	28.33	19	31.66
3	Unawareness regarding technologies	44	73.33	16	26.66	0	0.00
4	Lack of time availability	36	60.00	13	21.66	11	18.33
5	Uneconomic holding	27	45.00	18	30.00	15	25.00
6	Lack of interest	12	20.00	16	26.66	32	53.33

Source: Primary data Note : SF – Strongly Felt, SWF – Somewhat Felt, NF – Not Felt

Perceived Benefits of Post-Harvest Processing in Tapioca

The respondents in the study area are hardly familiar with post-harvest processing. However most of them were aware about value added products of tapioca. Most of

the respondents (92%) strongly felt that post-harvest processing would enhance the demand for tapioca and majority (82%) believed that income level of the farmers would also increase. A majority of the respondents (85%) also agreed that value addition reduces storage losses and fetches high prices (72%). In total, the farmers have a positive perception towards post-harvest processing, but the uncertainty of the market is still an obstacle and a challenge. Only 52 per cent believed that that post-harvest processing could ensure more markets. Chakrabarti *et al* (2014) also remarked that value addition should improve the returns from the crop and also increase the demand for the product.

Table 5. Perceived Benefits of Post-Harvest Processing in Tapioca

N = 60

Sl. No.	Perceived benefits	SF		SWF		NF	
		Nos.	%	Nos.	%	Nos.	%
1	Value added opportunities are more in Tapioca	11	18.33	49	81.66	0	0
2	Value added products fetch high prices	43	71.66	17	28.33	0	0
3	Value addition reduces storage loss	51	85.00	9	15.00	0	0
4	Income level of farmers would enhance due to value addition process of Tapioca	49	81.66	11	18.33	0	0
5	Demand for Tapioca would increase	55	91.66	5	8.33	0	0
6	Could ensure more market	31	51.66	29	48.33	0	0

Source : Primary data Note : SF – Strongly Felt, SWF – Somewhat Felt, NF – Not Felt

Perceived Benefits of Collective marketing

Table 6 depicts the perceived benefits of collective marketing. Smallholding farmers are mostly scattered and, therefore, generally there is a need to bulk their produce in order to access urban markets or to meet the requirement of the processing industry. Bulking can be done through different modalities and by different players in the value chain, like middle-men and traders, processing companies, State Marketing Boards or collective marketing interventions. Fifty three per cent of the respondents strongly felt that collective marketing would result in a better price and 48 per cent of the farmers somewhat felt that collective marketing would result in reduced expenditure. Seventy eight percent of the respondents strongly agreed that collective marketing would help in collective bargaining for better pricing.

Table 6. Perceived Benefits of Collective Marketing

N = 60

Sl. No.	Perceived Benefits	SF		SWF		NF	
		Nos.	%	Nos.	%	Nos.	%
1	Collective bargaining	47	78.33	13	21.66	0	0
2	Better price	32	53.33	28	46.66	0	0
3	Huge quantum of production	19	31.66	27	45	14	23.33
4	Large scale distribution	21	35	19	31.66	20	33.33
5	Reduced expenditure	16	26.66	29	48.33	15	25.00
6	Others	0	0	0	0	0	0

Source: Primary data Note: SF – Strongly Felt, SWF – Somewhat Felt, NF – Not Felt

Based on the inputs derived from the above discussed findings, SWOC and COWS analysis were performed and the outcome is presented in the form of an interactive matrix (Fig. 1 and Fig. 2) to work out an inclusive strategy.

SWOC Analysis of Tapioca Cultivation and Value Addition

Fig. 1. SWOC Matrix Analysis

STRENGTH	WEAKNESS
• Tapioca grows and produces best under warm humid tropical conditions where rainfall is well distributed and fairly abundant. Hence it is well suited for Kerala's climate and soil. • The raw material required for Tapioca such as planting material, equipment *etc.*, are affordable and hence the cost of production is possibly low. • Primary data analysis revealed that inputs required other than labour are abundant and easily available. • The supportive secondary data showed that processing of tapioca didn't require a huge investment and could be carried out without much difficulty.	• Tapioca products are not as widely accepted as the other products in terms of taste and not enjoyed by all kinds of customers. • Tapioca contains a poisonous substance called cyanogenic glucosides (compounds of cyanide and glucose) which hinder the processing of tapioca. • The farmers are cultivating different unorganised varieties of tapioca, which leads to difficulty and poses challenges in standardisation and value addition.

OPPORTUNITIES	CHALLENGES
• Tapioca has huge value addition opportunities and most of them are not yet exploited much. • Collective marketing will provide promising scope for marketing of tapioca. • The newly standardised and quality value added opportunities established will open a new arena of export and domestic markets. • More research and development activities evolve new cultivation practices, varieties and more value addition opportunities for tapioca.	• The dynamic growth of food industry attracts many players. Competition from similar value added products of other agricultural products are high. (The tapioca fried chips have competitions from banana chips, potato chips *etc.*) • Tapioca growers are not organised hence resulting in scattered production of tapioca. • The farmers are not aware about value addition opportunities and technologies available. Hence they are less motivated towards post-harvest processing of tapioca. • Continuous rodent and pest attack of tapioca plant affects the yield

Source: Primary data

Fig. 2 COWS Matrix Analysis

	OPPORTUNITY	CHALLENGES
STRENGTHS	• Formation of farmer producer organisations to carry out value addition and collective marketing • Conduct training programmes and workshops to familiarise with value addition techniques. • Cultivation of hybrid varieties of tapioca to ensure good quality and high yield. • Conducting research programs to identify new value added products and more markets for the products. **SO (Maxi – maxi strategy)**	• Popularize value added products of tapioca by conducting exhibitions. • Organise farmers and cultivate the same variety for getting consistent quality products. • Conduct awareness campaigns to carry out post-harvest processing at farm level. • Use of modern rodent and pest control mechanisms developed by research institutions. **ST (Maxi – mini strategy)**
WEAKNESS	• Extend the area under cultivation of tapioca. • Linkage and co-ordination mechanism for cultivation and marketing of tapioca. • Standardisation and certification process to ensure quality of the products. • Ensure continuous demand and supply of Tapioca. **WO (Mini – maxi strategy)**	• Identification of proper and regular marketing channels through stakeholders participative value chain development. • Conduct research programmes to reduce poisonous effect of tapioca. • Total quality control mechanism for consistent quality and taste. **WC (Mini – mini strategy**

Source: Primary data

Conclusion

Based on the derivation of findings, SWOC and COWS analysis carried out, the small and marginal farmers' inclusive strategy for tapioca production, processing and marketing has been drawn and given below:

1. The farmers can cultivate improved varieties (short duration and high yielding) meant for value addition developed by CTCRI and KAU.
2. The research and extension institutions should take initiative to create awareness among small and marginal farmers regarding value addition of tapioca and its benefits.
3. Motivation and promotion of Farmer Producer Organisations for tapioca farmers to start post-harvest processing and enhance farm income.
4. Conduct awareness campaigns to carry out post-harvest processing at the farm level.
5. Conduct training programmes and workshops to familiarise with value addition techniques.
6. Establish standardisation and certification process to ensure quality of the products, by advocating Good Agricultural Practices (GAP) and Good Management Practices (GMP).
7. Motivate and empower the farmers to become active players in the verticals of tapioca value chain through human resource development programme.
8. Nurturing exclusive agri-business incubators for small and marginal farmers of tapioca in processing, value addition, and marketing by attracting investment through Corporate Social Responsibility (CSR) and Public Private Partnership (PPP) mode.
9. Initiating farmer driven producer organisations and producer-consumer linked value chain would be a promising inclusive strategy for livelihood of small and marginal farmers of tapioca.
10. Ensure the livelihood of small and marginal farmers of tapioca through active convergence of resources of stakeholders' institutions towards achieving sustainable development goals.

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