



# Economic feasibility of on-farm processing and value chain of cashewnut in West Garo Hills of Meghalaya

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(Manuscript Received: 05-07-2018, Revised: 07-10-2018, Accepted: 01-11-2018)

## Abstract

Value chain of cashew has got greater potential in income generation and farm level employment. It was observed that increase in farm size is accompanied by higher productivity and remunerative price fetched by large farmers as compared to other categories of cashew growers. The net price received by the farmers was the highest when they sold their produce directly to consumers. The highest benefit cost ratio was achieved by the large farms because of judicious expenditure in cashew production and obtaining a sizeable amount of returns. In the West Garo Hills, cashew value chain needs application of modern technology and proper management practices for better production and marketing. The study highlight that the prospect of cashew value chain in Meghalaya is bright as the trend of other traditional crop production in the potential areas is quite encouraging for the organic cashew farming. There is enough scope for enhancing organic produce of cashew. Direct marketing of cashew produce always fetch good price for the producer but it is not possible for all categories of farmers. Therefore, formation of cooperative societies of cashew growers is suggested for marketing of various inputs as well as outputs of cashew produce.

**Keywords:** Cashewnut, direct marketing, marketing efficiency, Meghalaya, value chain

## Introduction

Cashew (*Anacardium occidentale* L.) is grown mostly in Asia, Africa and Latin America. The average global productivity of cashew is about 500 kg ha<sup>-1</sup> while it is about 650 kg ha<sup>-1</sup> in India. Eventhough cashew is cultivated largely as a neglected crop, it ends up as a favorite snack food all over the world. Advancements in propagation, production, management and mechanized processing has gained cashew the status of a commercial crop. Ever rising demand for raw cashew nuts and attention for commercialization have made this change possible in cashew sector (Venkattakumar, 2009). In India, cashew is cultivated mainly in Kerala, Karnataka, Maharashtra and Goa along the West Coast, and Tamil Nadu, Andhra Pradesh, Odisha and West Bengal along the East Coast region (DCR, 2011).

Presently, cashew cultivation in major growing states receives dwindling importance in response to

the price fluctuations in arecanut, cocoa, rubber and coconut. Studies covering major cashew growing states have identified poor adoption of cashew production technologies by farmers leading to poor productivity. This drop in productivity, coupled with fluctuating prices, is forcing cashew farmers in the major cashew growing regions to shift to more remunerative cash crops (Ganapathi and Akash, 2013; Sajeev *et al.*, 2014a,b, 2015; Sajeev and Saroj, 2015, 2018; Sajeev and Meera Manjusha, 2016; Venkattakumar, 2006, 2008). However, cashew cultivation has spread to non-traditional areas like Chhattisgarh, Jharkhand, Gujarat, Bihar and northeastern states like Meghalaya, Manipur and Tripura and also to Andaman and Nicobar Islands.

A value chain involves a series of value generating activities through which a farm / firm develops a competitive advantage and creates value. Value chain is the full range of activities and services

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required to bring the products or services from conception, through production and delivery to final consumers (Kaplinsky and Morris, 2000). Value chain analysis (VCA) is a method for accounting and presenting the value that is created in a product or service as it is transformed from raw inputs to a final product consumed by end users. It is a production or marketing strategy driven by customers need and preferences. The analysis consists of identifying chain actors at each stage concerning functions, relationships, governance, leadership and identifying value adding activities in the chain. Value chain actors are mostly in the private sector, but may include public sector organizations such as institutional buyers (Naveen, 2014). According to Aksoy (2005), farmers, traders, wholesalers, retailers, big retail chains and consumers are the major actors in the value chain. Value chain development is a market-oriented approach and all activities of a particular chain are directed towards the market (Ganapathy *et al.*, 2014). Supply chain and value chain both complement each other. Supply chain focuses upstream on integrating supplier and producer process for improving the efficiency and reduces the wastage, whereas, value chain focuses downstream on creating value for customers. Reddy *et al.* (2010) remarked that value addition is one of the alternatives to enhance the income of the farmers.

Meghalaya in the North-East region is endowed with diverse agro-climatic conditions, rich genetic diversities, vast hydrological resources and pollution free environment that offer a great scope to develop agro-ecosystem a specific technological intervention for diversification of the agriculture and allied activities *viz.*, horticulture, animal husbandry and fisheries *etc.* The state displays a distinct ethnic, socio-cultural and geographical identity. Cashew cultivation is a technically feasible, financially viable and bankable activity in the areas identified suitable for it, based on agro-climatic conditions. West Garo Hills district has an area of 4899 ha under cashew with an estimated annual production of about 12603 metric tonnes of raw cashew nut (2012-13) while Meghalaya recorded production of 5.83 thousand metric tonnes and productivity of 686 kg ha<sup>-1</sup> during 2016-17.

Farmers' income can be increased not just by increasing productivity but also through efficient

and effective value addition. The difference between price paid by consumers for value added products and farmers realization has been increasing rapidly. Lack of backward linkages between farmers, processors and longer chain intermediaries has resulted in lack of adequate economic benefits to farmers. Value addition to farm produce (cashew) is possible through cleaning, grading, packaging, processing, branding and marketing. Value addition has a potential to generate more local jobs, better income and services. Efficient value chain analysis is a pre-requisite in the development process of any economy. Cashewnut marketing plays a pivot role in fostering and sustaining the tempo of rural development in the study area. Meghalaya has become very popular in organic farming which gives very good returns from the Garo Hills region as well as export market. The low input intensity of agriculture in Meghalaya makes cashew ideally suited for organic produce. The study signifies and confirms the economics of cashew production for sustainable resource management, enhanced income generation and enlarged employment opportunities on a long term prospective. The study was done with the objectives of exploring economic feasibility of on farm processing cashewnut in order to facilitate cashew farmers to have a greater share of consumer rupee, to analyse the existing marketing strategies and value chain of cashew into different end products with distinct demand to facilitate entrepreneurs to undertake value addition and to suggest schemes and policies for value chain of cashew in study area.

## Materials and methods

The present study was conducted with the sample of 120 cashew farmers comprising of 60 small (1 to 2 ha), 40 medium (2 to 4 ha) and 20 large (> 4 ha) farmers from eight villages of Selsella and Dadenggiri CD Blocks of West Garo Hills district of Meghalaya through stratified random sampling method. The West Garo Hills district in Meghalaya was selected purposively due to concentration of cashew growers in this district as compared to other districts. The data were collected from the sample cashew growers through personal interview method with the help of well-designed schedule covering all aspects.

Besides, a sample of 10 village traders, 10 retailers, five wholesalers, three pre-harvest contractors and two processors in the each major marketing centre of Tura, Selsella and Dadenggre of West Garo Hills district was randomly selected. Data pertaining to the agricultural year 2016-17 was considered with specific objectives. Benefit cost ratio (BCR), net present value (NPV), internal rate of return (IRR), value chain and/or marketing channel, price spread, marketing efficiency, producer's share in consumer's rupee, simple percentage, average and appropriate formulae as per methodology were used to analyze the collected data.

## Results and discussion

### Cost of cultivation of cashew

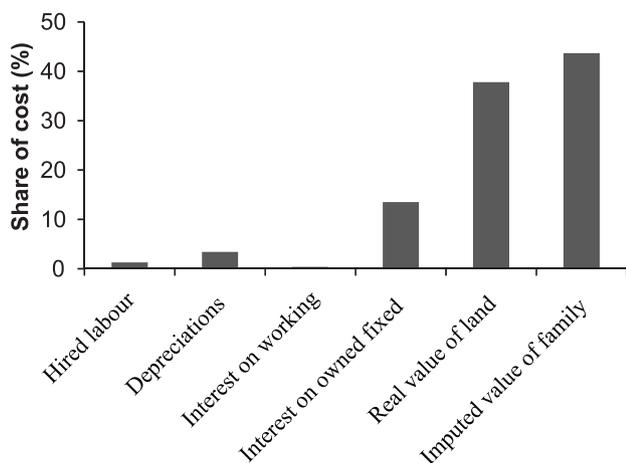
The cost concept analysis in cashew cultivation shows that the cashew orchard is capital intensive in its initial stage and labour intensive later which shows its cost increasing gradually from year to year. The cost of cultivation of cashew is presented in Table 1 and share of cost items in total cost is presented in Figure 1. Since the fruit bearing of cashew starts in fifth year of cultivation, for better understanding, the cost of cultivation of cashew was added up to fourth

year of cultivation. During the period of first fourth year of cultivation, the cost  $C_2$  (comprehensive cost) decreased from ₹ 96,620 ha<sup>-1</sup> to ₹ 15,926 ha<sup>-1</sup> in the fifth year in West Garo Hills district. But the cost increased gradually from ₹ 17137 ha<sup>-1</sup> in the sixth year to ₹ 19861 ha<sup>-1</sup> in the tenth year of cashew cultivation. The cost  $C_2$  was worked out to be higher in the first four years of cultivation because of establishment cost, which is capital intensive, and later on, the cost increased year to year due to the cultivation becoming labour intensive. Similar findings were made by Raikar (1990) about the cost and returns of cashew plantations in Karnataka. The per hectare total cost, which comprised of establishment cost and annual maintenance cost of cashew cultivation, the overall total establishment cost was worked to ₹ 17604, of which, planting cost and maintenance cost were worked out to be ₹ 15,247 and ₹ 2,340, respectively. The net returns obtained were ₹ 2,645. Similarly, Dalvi *et al.* (1991) estimated the economics of production of cashew in Sindhurga district of Maharashtra. The per hectare cost of maintenance of local cashew orchard (cost A and cost B) was worked out to be ₹ 2243 and ₹ 3474, respectively. The per hectare cost of maintenance of local cashew orchard (cost C) was

**Table 1. Cost of cultivation of cashew in West Garo Hills of Meghalaya (₹ ha<sup>-1</sup>)**

Cost items/particulars	1 <sup>st</sup> to 4 <sup>th</sup> year	5 <sup>th</sup> year	6 <sup>th</sup> year	7 <sup>th</sup> year	8 <sup>th</sup> year	9 <sup>th</sup> year	10 <sup>th</sup> year
Establishment cost	21842 (25.2)	-	-	-	-	-	-
Hired labour	3272 (3.8)	676 (4.2)	632 (3.7)	581 (3.2)	458 (2.4)	372 (1.9)	255 (1.3)
Depreciation	2686 (3.1)	671 (4.2)	671 (3.9)	671 (3.7)	671 (3.5)	671 (3.4)	671 (3.4)
Sub total	27800 (32.1)	1347 (8.5)	1304 (7.6)	1252 (7.0)	1129 (5.9)	1044 (5.3)	927 (4.7)
Interest on working capital @8.75 %	2432 (2.8)	118 (0.7)	114 (0.7)	110 (0.6)	99 (0.5)	91 (0.5)	81 (0.4)
Cost A <sub>1</sub>	30233 (34.9)	1465 (9.2)	1418 (8.3)	1362 (7.6)	1228 (6.5)	1135 (5.8)	1008 (5.1)
Cost A <sub>2</sub>	30233 (34.9)	1465 (9.2)	1418 (8.3)	1362 (7.6)	1228 (6.5)	1135 (5.8)	1008 (5.1)
Interest on owned fixed assets (excluding land)	10755 (12.4)	2689 (16.9)	2689 (15.7)	2689 (14.9)	2689 (14.1)	2689 (13.7)	2689 (13.5)
Cost B <sub>1</sub>	40988 (47.3)	4154 (26.1)	4107 (24.0)	4050 (22.5)	3917 (20.6)	3824 (19.5)	3697 (18.6)
Rental value of land less land revenue + rent paid for leased in	30000 (34.6)	7500 (47.1)	7500 (43.8)	7500 (41.7)	7500 (39.5)	7500 (38.3)	7500 (37.8)
Cost B <sub>2</sub>	70988 (82.0)	11654 (73.2)	11607 (67.7)	11550 (64.2)	11417 (60.1)	11324 (57.8)	11197 (56.4)
Imputed value of family labour	15633 (18.0)	4272 (26.8)	5531 (32.3)	6442 (35.8)	7590 (39.9)	8276 (42.2)	8664 (43.6)
Cost C <sub>1</sub>	56620 (65.4)	8426 (52.9)	9637 (56.2)	10493 (58.3)	11507 (60.5)	12100 (61.7)	12361 (62.2)
Imputed value of family labour	15632 (18.0)	4272 (26.8)	5531 (32.3)	6442 (35.8)	7590 (39.9)	8276 (42.2)	8664 (43.6)
Cost C <sub>2</sub>	86620 (100.0)	15926 (100.0)	17137 (100.0)	17993 (100.0)	19007 (100.0)	19600 (100.0)	19861 (100.0)

Note: Figures in the parentheses are percentage to the total cost  $C_2$ .



**Fig. 1.** Share of cost in total cost of cashew cultivation in West Garo Hills of Meghalaya

worked out to be ₹ 4382. The gross value of main and by-product was ₹ 7027 per hectare and the net return per hectare obtained was ₹ 2,645.

#### *Economic returns of cashew*

The economic return from cashew cultivation is presented in the Table 2. The yield of cashew was found to increase gradually from 572 kg ha<sup>-1</sup> in the fifth year to 2078 kg ha<sup>-1</sup> in the tenth year. The gross farm income was found to increase from ₹ 34,321 ha<sup>-1</sup> in the fifth year to ₹ 1,24,685 ha<sup>-1</sup> in the tenth year. The net farm income was found ₹ 104824 ha<sup>-1</sup> in the tenth year of cashew cultivation. The net returns including family labour was found to be positive from 7<sup>th</sup> year (₹ 5369 ha<sup>-1</sup>) onwards in which the cost incurred in the previous year was covered up and profit started. The returns excluding family labour was worked out to be

positive from fifth year (₹ 14416 ha<sup>-1</sup>) and farm business income was estimated to be positive from fifth year onwards in West Garo Hills district (₹ 2624 ha<sup>-1</sup>). The farm investment income was worked out to be positive from sixth year (₹ 21822) ha<sup>-1</sup> of cashew cultivation. The net present value (NPV) was estimated to be positive from eighth year (₹ 17017 ha<sup>-1</sup>) onwards. The benefit cost ratio (BCR) over total cost was found to be greater than one, from the fifth year (2.2) onwards in the study area. Moreover, the economic return analysis shows that cashew cultivation in West Garo Hills of Meghalaya is highly profitable from the fourth year onwards and its profitability must be realized by the cashew farmers of the state. Raikar (1990) reported that the net present worth was positive and high in case of small size plantations than that of large size plantations in Karnataka. Sajeew *et al.* (2014) also analysed that the technology impact on area, production and productivity of cashew as a pre-requisite for developing and initiating innovative technology interventions for enhancing productivity and profitability of cashew cultivation.

#### *Value addition analysis of cashew*

In West Garo Hills, grading and packing of raw cashewnut is done by village merchants, wholesalers and processors. The highest cost is incurred by the wholesaler (₹ 200/- qtl) followed by village merchant (₹ 70/- qtl of cashewnut) and processor (₹ 60/- qtl). For cleaning and drying of raw cashewnut, the cost incurred by wholesaler was ₹ 100/- qtl. It was observed that cashew producers incur cost of value addition of raw cashewnut

**Table 2.** Economic returns analysis of cashew in West Garo Hills of Meghalaya (₹ ha<sup>-1</sup>)

Returns	1 <sup>st</sup> -4 <sup>th</sup> Year	5 <sup>th</sup> Year	6 <sup>th</sup> Year	7 <sup>th</sup> Year	8 <sup>th</sup> Year	9 <sup>th</sup> Year	10 <sup>th</sup> Year
Yield (kg ha <sup>-1</sup> )	-	572	768	1045	1402	1715	2078
Gross farm income (GFI)	-	34321	46052	62673	84123	102880	124685
Net farm income (GFI- cost C <sub>2</sub> )	-86620	18395	28914	44680	65116	83280	104824
Returns including family labour	-86620	-68225	-39311	5369	70485	153764	258588
Returns excluding family labour	-15633	14416	54937	111168	187700	282304	398325
Farm business income (GFI-cost A <sub>2</sub> )	-30233	2624	47258	108569	191463	293208	416885
Farm investment income	-4005865	-17281	21822	76690	151995	245463	360476
(Farm business income- imputed value of family labour)							
NPV	-	-60778	-40901	-15009	17017	52669	91901
BCR: output /input ratio over total cost (GFI/cost C <sub>2</sub> )	-	2.2	2.7	3.5	4.4	5.2	6.3

through cleaning and sun drying and raw cashewnut were disposed to the village merchants and wholesalers in the study area. Srinivas and Raju (1991) stated that total processing cost per bag (80 kg) of raw nuts was ₹ 124/- which involved various stages. The cost of drying of nuts, roasting of nuts, shelling of nuts, drying of shelled kernels, peeling, grading, conditioning of graded kernels, and packing of graded kernels were reported to be respectively ₹ 3.80, ₹ 3074.00, ₹ 1.00, ₹ 21.80, ₹ 580, ₹ 0.64 and ₹ 52.60. Ipte and Borude (1982) reported that the total cost of marketing of two tins (22.9 kg) of kernels obtained from one quintal of raw nuts estimated to be ₹ 72. The sale value and the net returns realized was ₹ 1017/- and ₹ 117/-, respectively. The value addition accounted for 52.7 per cent.

### Price spread of raw cashew marketing

From the Table 3, it is evident that the net price received by producer in case of marketing channel I, II and III was ₹ 8000/-, ₹ 11000/- and ₹ 11500/- respectively in Tura market. It was estimated that the net price received by producer (per quintal of cashew) was highest of ₹ 11500/- in Channel III at Tura market followed by ₹ 11150/- at Selsella market and ₹ 10150/- at Dadenggre market. The marketing cost of cashew was the highest in case of Channel III (₹ 1665/-) followed by Channel II (₹ 1320/-) in Tura market. The marketing cost in channel III in Dadenggre and Selsella market was ₹ 1405/- and ₹ 1500/- respectively. Marketing margin earned by different intermediaries was the highest in case of Channel III (₹ 1500/-) in Tura market followed by ₹ 1426/- in Selsella market. Consumer paid the highest price in case of Channel III *i.e.*, ₹ 14665/-, ₹ 14076/- and ₹ 12847/- in case of Tura, Selsella and Dadenggre market respectively. It was observed

that the price spread was the highest in Channel III (₹ 3165/-) per quintal of cashew in Tura market and the lowest in Channel I (₹ 1040/-) in Dadenggre market. But the marketing of cashew through Channel II was the most preferred by the cashew growers. Hence, the study suggests to strengthen Channel II and encouraging the cashew farmers for better marketing and value addition of cashew in the state of Meghalaya. Similar studies were made by Ravi *et al.* (1995) and it revealed that six channels were used in marketing of raw cashew in Dakshina Kannada district of Karnataka. The pre-harvest contractors, village merchants, commission agents and wholesalers were the major intermediaries involved in handling cashew as the produce moved through various channels. A great majority of the cashew growers sold their produce to village merchants. Raikar *et al.* (1990) studied the price spread of cashew in two districts of Karnataka and identified six marketing channels for marketing of cashew. The producer's share of the consumer price was highest when the produce (raw nuts) was sold directly to processing units rather than national market because of number of obligations that had to be met by processors/exporters in exporting the kernels.

### Marketing efficiency of cashew

It is evident from the Table 4, that the total marketing cost of Channel II, Channel II, and Channel III was ₹ 730/-, ₹ 1320/- and ₹ 1665/- per quintal of raw cashew respectively in case of Tura market. Similarly, in case of Dadenggre market, the marketing cost of cost of Channel I, Channel II, and Channel III was ₹ 670/- ₹ 1125/- and ₹ 1405/-, respectively. In Selsella market, it was estimated that the total marketing cost of Channel I, Channel II, and Channel III was ₹ 710/-, ₹ 1185/- and ₹ 1500/- per quintal of raw cashew, respectively.

**Table 3. Price spread of cashew raw nut in different marketing channels in West Garo Hills of Meghalaya (₹ qtl<sup>-1</sup>)**

Particulars	Tura market			Dadenggre market			Selsella market		
	Marketing channel								
	I	II	III	I	II	III	I	II	III
Net price received by producer	8000	11000	11500	7200	9460	10150	7600	10400	11150
Marketing margin	425	1140	1500	370	1065	1292	400	1110	1426
Marketing costs	730	1320	1665	670	1125	1405	710	1185	1500
Price paid by the consumer	9155	13460	14665	8240	11650	12847	8710	12695	14076
Price spread	1155	2460	3165	1040	2190	2697	1110	2295	2926

**Table 4. Indices of marketing efficiency of cashew raw nut in different marketing channels(₹ qtl<sup>-1</sup>)**

Particulars	Tura market			Dadenggre market			Selsella market		
	Marketing channel								
	I	II	III	I	II	III	I	II	III
Value of goods sold (V)	9155	13460	14665	8240	11650	12847	8710	12695	14076
Marketing cost (I)	730	1320	1665	670	1125	1405	710	1185	1500
Index of marketing efficiency (E)	11.5	9.2	7.8	11.3	9.4	8.1	11.3	9.7	8.4

The value of goods (raw cashew) sold at Tura market in Channel I, Channel II and Channel III was ₹ 9155/-, ₹ 13460/-, ₹ 14665/- per quintal, respectively. It was worked out that the value of goods (raw cashew) sold in channel III was highest (₹ 14665/-) in Tura market followed by ₹ 14076/- in Selsella market and ₹ 12847/- in Dadenggre market. The indices of market efficiency of 11.5 in Channel I was the highest in Tura market as compared to the rest of the channels due to the existence of only one middleman. Similarly the marketing efficiency in Channel I of Dadenggre and Selsella market was 11.3. But in case of Channel II and III, the marketing efficiency indices were 9.2 and 7.8, respectively at Tura market. It was worked out that in case of Channel II and III, the marketing efficiency indices was 9.4 and 8.1 in Dadenggre market and 9.7 and 8.4 in Selsella market, respectively. Sundaravaradarajan and Jahanmohan (2002) have discussed the marketing cost, margin, price spread and marketing efficiency of cashew in Tamil Nadu, in their study following four different marketing channels of cashew.

### Suggestions and policy implications

It is evident that apart from the economic importance of cashew value chain, it has got great potential in generating income and employment at farm level. It was observed that increase in farm size is accompanied by higher productivity and remunerative price fetched by large farmers as compared to other categories of cashew growers. The net price received by the sample farmers was the highest when they sold their produce directly to consumers. The highest BCR was achieved by the large farms because of judicious expenditure in cashew production and obtaining a sizeable amount of returns. During the production process, the cashew growers experienced the problems of high infestation of pest and diseases, high input costs, scarcity of labour and poor quality of planting

materials. Lack of marketing facilities is one of the problems faced by cashew growers, for which they are not getting remunerative prices. In the West Garo Hills, cashew value chain needs application of modern technology and proper management practices for better production and marketing. Based upon the results of the study, the following conclusions and policy implication can be suggested for improvement of the value chain of cashew in West Garo Hills of Meghalaya.

- Adoption of recommended technology and sustainable utilization of resources and farm inputs can help cashew growers in minimizing the cost of production. Training is needed for adopting modern cultivation practices in cashew in the study area.
- At the primary level, value addition is almost non-persisting or non-existent. Among other factors, lack of suitable preservation methods at the farmer's end further aggravate the losses.
- Post-harvest loss due to mishandling, non-hygienic practices, immature harvesting *etc.* have also been constraints for the farmers in the way of getting a good price of the produce.
- Proper integration is required among different cashew growers and agencies who are engaged in production, marketing and processing (value addition) of cashew kernels for designing their future policies.
- Cashew in Garo Hills region of Meghalaya is found to be economic feasible which can be made more beneficial by reducing the cost of production through intervention of modern techniques in cashew cultivation.
- Direct Marketing of cashew produce will fetch good price for the producer but it is not

possible for all categories of farmers. Therefore, formation of cooperative society of cashew growers is suggested for procuring various inputs as well as marketing of produce of the member farmers.

- The farmers of Garo hills region are resource poor and unable to afford the input costs as well as expenditures for marketing of cashew produces. Therefore, the financial support is necessary for the cashew farmers through exclusive credit facilities.
- Strengthening of most popular channel to enhance the operational marketing efficiency through intervention of post-harvest technologies like grading, sorting, packing *etc.* which will enhance the due share of cashew producer in consumers price.
- There is a need for promoting cashew producer's cooperative, adequate short term credit facilities, develop market intelligence services, introduce support price and insurance scheme for cashew in Meghalaya state.

### Acknowledgement

The author is grateful to the referee for his valuable comments and helpful suggestions.

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