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Analysis of value chain and constraints faced by cluster bean farmers in Rajasthan

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Abstract

Cluster bean (*Cyamopsis tetragonoloba* L. Taub.), commonly known as Guar, has been cultivated in India since ancient times for human consumption and fodder purposes. The cluster bean processing units are mainly located in Jodhpur, Bikaner, Sri Ganganagar, Alwar and Jaipur districts of Rajasthan. The study has been conducted in Hanumangarh district which has the potential area under cluster bean cultivation in Rajasthan for analysis of value chain of cluster bean. A total sample size was 100 farmers for present study. The secondary data were collected from various published and unpublished sources. The main player is farmer's trader's miller's wholesaler's retailers & consumers. The highest value addition per quintal was done by the miller which helped him to income Rs. 454.76 which is significantly higher than those done by the other players. Major constraints in production stage are inadequate supply of quality certified seed, non-availability of technical know-how, and high cost of inputs, lack of adoption of plant protection measures, labour scarcity, and lack of irrigation facilities. Marketing constraints includes high cost of transportation, price fluctuations, lack of availability about market news and intelligence, inadequate transportation facility, inadequate processing unit in local area and lack of storage facility.

Keywords: Cluster bean, Value chain, wholesaler's retailers, consumers

Introduction

The cluster bean processing units are mainly located in Jodhpur, Bikaner, Sri Ganganagar, Alwar and Jaipur districts of Rajasthan. A few processing units are also located in neighboring states of Haryana and Gujarat. These units can be classified into cluster bean split manufacturers and gum processor. USA is the biggest importer of its gum and gum powder from India. With around 150 split units in India with total installed capacity of more than 6 Lakh tonnes per Annum. All the cluster bean processing steps have indigenous machinery in their processing plant. The splits of cluster bean are available in various grades in terms of purity (90%, 92%, 95% and 97%). Out of total 40% of the export related to cluster bean is contributed by pulverized gum in the form of refined splits. Agriculture Produce Marketing Committee (APMC) markets of Rajasthan; Haryana & Gujarat have an important role to play in the supply chain. These APMC mandis provides a common platform for farmers for aggregation and operation. The trade in these markets is facilitated by various market intermediaries like traders and stockiest and they have to pay prescribed market fee on the value of transaction and it varies from state to state such as in Rajasthan is charged at the rate of 1.60 percent of value, Haryana it is 1.0 percent, while in Gujarat it is 0.50 percent and in Punjab no market fee charged on cluster bean trade. The peak arrival months in cluster bean trade are November and December. The most adopted channel for selling the cluster bean seed in India is through market intermediaries and they charge a prescribed fee of 2% as per APMC Act. Although AGMARK grades are defined but still market is controlled by industry grade as defined by the traders of the market. Due to the fact that the product has a very long storage life, almost all of the products purchased from the mandi by traders are released in a staggered way into the market as per the demand. The market price (trader to miller) is subjective to the stock positions. Most of the traders prefer to store seed of cluster bean in their own storage structures instead of storing in accredited warehouses. The demand of processed cluster bean in world market is expected to rise as there is expansion in shale oil gas fracking to new countries like China and Russia and scaling up in prominent existing countries like USA along with other uses in food and textile

industries owing to increased food safety and health concerns. According to energy consultants Wood Mackenzie, thousands of shale wells are expected to be drilled in the USA. Additionally around 400 shale gas wells are expected to come from outside USA mainly confined to China and Russia during 2014. The fracking may also commence in UK in 2014 after a suspension of 18 months ban imposed by the Government. Following objective of the study is:

- To study the value chain of cluster bean in the study area
- To identify the major constraints in production and marketing of cluster bean

Materials and Methods

Hanumangarh district which has the potential area under cluster bean cultivation in Rajasthan hence this was selected purposively. Two blocks from this district Nohar and Bhadra was selected and four villages from these blocks (two from each block) was selected purposively because it had substantial area under cluster bean cultivation. Out of 205 marginal farmers in the four sampled villages 40 farmers were selected on the basis of probability proportion randomly. Similarly small farmers in same sampled villages were consisting 155 farmers and out of it 30 farmers were selected randomly. Medium farmers in the sampled villages were consisting 105 farmers out of it 20 farmers were selected. Large farmers in sampled villages were consisting 45 farmers out of it 10 farmers were selected for in depth study. Thus a total of 100 farmers form the sample size of the present study from four existing categories. The survey was conducted during the agricultural year 2018-19. The simple tabular, percentage etc. were used for the presenting the results.

Constraints perceived by the respondents were prioritized by using Garrett’s ranking technique by using the following formula:

$$\text{Percent position} = 100 (R_{ij} - 0.5) / N_j$$

Where

R_i = Rank given for the ith variable by jth respondents

N_j = Number of variable ranked by jth respondents

With the help of Garrett’s Table, the percent position estimated is converted into scores.

Results and Discussion

Value chain identifies the market intermediaries (private, public, including service providers) and activities performed by them that bring a basic agricultural product from production from the farmer field into final consumption stage; where at each stage value is added to the product. Value addition starts with production followed by processing & packaging then storage and transportation and finally distribution. Every

segment in value chain is having one or more backward and forward linkages. Like other value chains cluster bean too have both backward and forward integrations. The cluster bean value chain analysis involves a number of functions and institutions.

After harvesting cluster bean, a numbers of market intermediaries are involved in the forward integration. In order to reach cluster bean seed to processor, farmer may sell to wholesaler or miller sell through the middlemen who buy produce from farmers. Under this chain, transporters have a function of transporting cluster bean to the mills. Processers have linkages with suppliers of machineries, utility suppliers, spare parts and packaging materials.

Stakeholders and stages in value chain for cluster bean

The major players in the value chain of cluster bean are the following. There are five major players that are identified in the cluster bean value chain. Processing of cluster bean in primary stage was done by miller removing of the cluster bean husk and grain (endosperm), and miller the husk to the retailer for the feeding animals, and sells grain (endosperm) sold to the manufactures for further processing and manufacturing of cluster bean products such as cluster bean gum. The value addition by different stakeholders in cluster bean is shown in Table 1

Table 1: The value addition by different stakeholders in cluster bean

Sl. No.	Players	Value addition
1.	Farmers	Production and primary processing (Cleaning)
2.	Traders	Storage, transportation
3.	Millers	Processing (guar split, churi, korma)
4.	Wholesalers	Cleaning, grading, storage packaging, transportation and quality certification
5.	Retailers	Promotion and marketing
6.	Consumers	Consumption

Average value realization of various actors in the cluster bean value chain

Table 2 presents the details of the operation of the value chain with reference to the year 2018-19 Kharif crop. The table explains the net income of the players at various stages of value chain. The cost of value addition, average logistic and the quantity loss during the value addition is included in the total cost of value addition. The net income per quintal was calculated for easy comparison of gain in the same quantity.

The farmers procure seed and produce the cluster bean. Therefore, there is no special value addition made by the farmers except primary cleaning. Thus, the farmers earn a net income of Rs. 2312.49 per quintal by spending Rs. 2026.01 on the production cost and selling the produce at Rs. 4423.40.

Table 2: Average value realization of various actors in the cluster bean value chain (Value in Rs.)

Players	Value Addition process	Cost of procurement per quintal	Total cost of Value Addition per quintal	Total production cost per quintal	Selling price per quintal	Net income per quintal
Farmers cost of production And primary cleanings	Post-harvest cleaning	2026.01	84.9	2110.91	4423.40	2312.49
Traders	Storage, transportation	4423.40	70.87	4494.27	4666.04	171.77
Millers	Processing (guar split, churi, korma, guar meal)	4666.04	355.55	5021.59	5476.35	454.76
Wholesalers	Cleaning, grading, storage packaging and transportation	5476.35	115.03	5591.38	5783.92	192.54
Retailers	Promotion and marketing	5783.92	35.1	5819.02	6044.64	225.62

The traders sell the produce at Rs. 4666.04 per quintal and earn a net income of Rs. 171.77 per quintal. In the same way, the millers generate the net income of Rs. 454.76 per quintal. The wholesalers and retailers generate a net income of Rs. 192.54 and Rs. 225.62 per quintal, respectively.

The highest value addition per quintal was done by the miller which helped him to income Rs. 454.76 which is significantly higher than those done by the other players.

Constraints faced by respondents in production and marketing of cluster bean in the study area

The producers were asked to indicate the most important problem faced by them and the results are presented below.

Problems faced by producers in the production of cluster bean Cluster bean has been a major crop of economic significance for farmers in semi-arid areas of Rajasthan due to low water requirement and production of grain and fodder. The productivity of cluster bean has been lower than the state average due to pure rainfed condition and sandy soil. However, some major constraints in production stage are inadequate supply of quality certified seed, non-availability of technical know-how, and high cost of inputs, lack of adoption of plant protection measures, labour scarcity, and lack of irrigation facilities. The data related to production constraints were analyzed and the findings have been presented in Table 3.

Table 3: Problems faced by producers in the production of cluster bean

Sl. No.	Particulars	Garret mean score	Ranking
1	Inadequate supply of quality certified seed	64.11	I
2	Non availability of technical know how	56.11	II
3	High cost of inputs	52.21	III
4	Lack of adoption of plant protection measures	51.31	IV
5	Labour scarcity	40.65	V
6	Lack of irrigation facilities	38.76	VI

The table revealed that, inadequate supply of quality certified seed was major problem faced by cluster bean grower with 64.11 average score in ranking, followed by problem of non-availability of technical knowhow, high cost of input, lack of adoption of plant protection measures and labour scarcity with average score of 64.11, 56.11, 52.21, 51.31 and 40.65 respectively. Therefore, these are the possible reasons for inferring it to be the highest ranking constraint. Non-availability of technical knowhow might be due to lack of skilled and efficient labors.

Problems faced by producers in the marketing of cluster bean Marketing constraints involved problems faced by the cluster bean growers during marketing of cluster bean. It included high cost of transportation, price fluctuations, lack of availability about market news and intelligence, inadequate transportation facility, inadequate processing unit in local area and lack of storage facility. The data related to marketing constraints has been presented in Table 4.

Table 4: Problems faced by producers in the marketing of cluster bean

Sl. No.	Particulars	Garret mean score	Ranking
1	Higher cost of transportation	47.48	I
2	Price fluctuations	46.77	II
3	Lack of availability about market news and intelligence	43.12	III
4	Inadequate transportation facility	41.98	IV
5	Inadequate processing unit in local area	38.31	V
6	Lack of storage facility	35.75	VI

It is clear from the table that, costly transportation was considered as the most important problem faced by the cluster bean grower. The cluster bean growers expressed the view that price fluctuation was the second most important constraint in cluster bean in the study area. Lack of availability of market news and intelligence was the next important problem faced by them. Inadequate processing unit in local area and lack of storage facility were other constraints as reported by cluster bean growers.

Conclusion

From the above analysis the value chain for cluster bean in Hanumangarh district of Rajasthan is characterized by numerous small producers, sellers and buyers. The farmers, traders, millers, wholesalers and retailers earn a share of Rs. 2890.02, Rs. 171.77, Rs. 454.76, Rs. 192.54 and Rs. 225.62 respectively.

Different type of constraints encountered by the farmers was analyzed in the study. Inadequate supply of quality certified seed, Non availability of technical know-how, high cost of inputs, Lack of adoption of plant protection measures, labour scarcity, and lack of irrigation facilities were major constraints in production of cluster bean. Major marketing problems faced by cluster bean growers were high rate of transportation, price fluctuations, lack of availability about market news and intelligence, inadequate transportation facility, inadequate processing unit in local area and lack of storage facility.

References

1. Agricultural Statistics at a Glance Year 2017-18 & Final estimates; c2018-19.
2. Arora RN, Manocha V, Manocha VP, Singh JV. Trends and variability in area, production and productivity of guar in India. *Annals of Arid Zone*. 1988;27(2):147-150.
3. Bannor RK, Melkamu M.. Forecasting wholesale price of cluster bean using the Autoregressive Fractionally Integrated Moving-Average Model: the case of Sri Ganganagar of Rajasthan in India. *Journal of Business Management and Economics*. 2015;3(8):01-07.
4. Bosale TG, Panwar RK, Jadhav SK. Economics of guar cultivation in Rajasthan: a case study. *Journal of Rajasthan Agricultural University*. 2005;25(1):52-54.
5. Chamola SD, Hasija RC. Analysis of attributes of guar production in India. *Forage Research*. 2005;10(1):31-36.
6. Choudhary HB. Economic study of guar in Rajasthan. *Journal of Indian Society of Agricultural Statistics*. 2007;66(1):102.
7. Devraj DK. Cluster bean production in Dausa: A Critical Review. *Agricultural situation in India*; 2010, 149-151.
8. Henry A, Kumar D. Trend of guar seed production in arid districts of Rajasthan vis-à-vis Rajasthan and India and export of guar gum. *Journal of Arid Legumes*. 2005;2(1):54-57.
9. Jyani M, Sharma H. Study on Marketing Cost and Margins of Cluster bean in Bikaner District of Rajasthan. *Economic Affairs*. 2018;63(1):53-56.
10. Jyani M, Sharma H, Meera. An Economic Analysis of Cluster Bean in Bikaner District of Rajasthan. *International Journal of Agriculture Science*. 2018;10:5672-5675.
11. Mishra AK. An economic analysis of production and marketing of guar. Ph.D. thesis, submitted to Rajasthan Agriculture University, Camp. Bikaner; c1991.
12. Narayan P, Kumar S. Constraints of growth in area production and productivity of pulses in India: An analytical approach to major pulses. *Indian Journal of Agricultural Research*. 2015;49(2):114-124.