Value Chain Analysis of Wheat in North Karnataka, India

ABSTRACT

The world desperately needs a change in the global food system that will result in more nutritious food for everyone and a significant reduction in the environmental impact of agriculture. The present study was conducted in selected districts of North Karnataka during 2022-23. To study the value chain mapping, primary data have been collected through the survey method by adopting a multistage random sampling technique. The value chain highlighted the involvement of diverse actors who participated directly or indirectly in the value chain. Different actors identified in the study area were input suppliers, farmers, traders and commission agents, wholesalers, retailers, and ultimately consumers. Three channels were placed in the value chain system of raw wheat grain in the study area. The results revealed that the degree of value addition on raw wheat grains at the retailer level was highest (11.14% and 11.34%) in channels I and II, respectively. Because the quantity sold through retailers was less, there was also less risk regarding spoilage of produce. With respect to the four primary processing product value addition results, processing units were substantially contributing more value addition as compared to the other two intermediaries in the value chain. Processing units require huge capital investment and plenty of resources.

Key words: Value chain, Wheat, Mapping, Value addition and North Karnataka.

1. Introduction

The world desperately needs a change in the global food system that will result in more nutritious food for everyone and a significant reduction in the environmental impact of agriculture. Agriculture plays a vital role in the Indian economy. The nation is exposed to all 15 significant climates. In addition, 46 of the 60 soil types that can be found on earth are present in India. It cultivates approximately half of its total geographical area, ranking it among the top agricultural land users. It is an important economic sector for the country's long-term and inclusive growth. The sector employs 47 per cent of the workforce, which is frequently seasonal, underemployed, and underpaid, and contributes approximately 18.60 per cent of India's GDP (Annual report of Department of Agriculture, 2022-23). India is a major producer of cereals, sugar, milk, fruits and vegetables, eggs and spices due to its enormous and diverse agricultural industry. India's agriculture sector is the backbone of its society, employing around 58 per cent of the population. India sustains 17.8 per cent of the world's people and 15 per cent of the world's cattle population despite having only 4 per cent of the world's water resources and 2.4 per cent of the world's land. (https://www.ibef.org/research/case-study/importance-of-India-s-agriculture-economy).

Wheat (*Triticum aestivum L.*) is India's second most significant cereal crop and it plays an essential role to the country's food and nutritional security. Wheat provides around 20 per cent of the calories consumed by nearly 55 per cent of the world's population. It is one of the country's principal food grains and a staple diet of the inhabitants of North India, where chapatti is preferred. Although there are several wheat species recognized around the world, only three are commercially cultivated in India i.e., *Triticum aestivum* (Bread wheat), *Triticum durum* (Durum wheat) and *Triticum dicoccum* (Emmer wheat). Bread wheat accounts for around 95 per cent of overall production, with durum wheat accounting for 4 per cent and emmer wheat accounting for approximately 1 per cent. Wheat was cultivated in six distinct agro-climatic zones in India i.e., the northern hills zone, the north western plains zone, the north eastern plains zone, the central zone, the peninsular zone and the southern hills zone. Wheat consumption has increased faster than any other major food grain in the country, particularly for pasta and bread, and is expected to continue to do so in the future (Ayele *et al.*, 2021). Over the next twenty years, Indian demand for wheat is expected to exceed domestic supply, with the gap between supply and demand becoming more pronounced toward 2030. India is expected to be one of the highest wheat demanding and supplying nations in the world, second only to China (Paulsen *et al.*, 2019).

Value addition refers to the process of enhancing the value, quality or desirability of a product or service through various means. It involves incorporating additional features, improving functionality, increasing benefits or modifying the presentation to meet customer needs and preferences (Nagarethinam and Angles, 2020). Value addition in wheat refers to the process of transforming raw wheat into higher-value products through various methods. This can involve improving the quality, nutritional value, functionality, or diversifying the product range (Nithya and Nandi, 2019).

Value chain mapping helps to reveal the flow of product from farmers to final consumer through various actors. It also helps to identify different actors in the value chain and role played by them and value addition at different stages by them (Pavithra *et al.*, 2018).

Value chain analysis is a useful tool to identify the primary stages in wheat production and value addition in future. It helps in identifying the cost and value shares of various players, linkages and challenges (Singh *et al.*, 2013). With this backdrop, the present paper highlighted value chain analysis of wheat in Karnataka.

2. Material and methods

To study the value chain mapping, multistage sampling method was used for selection of wheat growers as well as processors. Based on the highest area under wheat crop, three districts viz., Belagavi, Vijayapura and Dharwad were purposively selected in the first stage. In the second stage, from each the district selected, two taluks were selected based on the highest area under wheat. Thus, from Belagavi district two taluks, namely, Savadatti and Athani, from Vijayapura district Sindagi and Indi taluks and from Dharwad district Navalgund and Kundgol taluks were selected. In the next stage, 15 wheat growers were selected randomly from each of the selected taluk. Thus a total of 90 wheat growers were selected for the study. Depending upon the availability of processing units in the study area, three processing units were selected from each district randomly. In the study area, two types of wheat processing units and four primary processing products were identified namely Maida, Atta and Bombay rawa units (5 units) and Kesari rawa units (4 units). The primary data pertaining to the study were collected from 60 respondents (30 farmers and 30 market intermediaries) and 3 processing units from each selected district in the study area in Karnataka with total sample size of 189 respondents.

3. Results and discussion

3.1 Mapping the Value Chain

The core data used in the proposed mapping approach was augmented with field interviews with businesses located along the value chain. The value chain map has been displayed in a standard fashion, with associated businesses for each level of the value chain highlighted in the right-hand corner and the left-hand corner of the map, respectively (Singh and Guleria, 2021). The channels are often vertical chains of businesses that process raw resources and distribute completed items to customers. The stakeholders of the value chain were designed by boxes, as shown in Fig. 1. In the wheat value chain map, the channels have been identified on the basis of core business units, i.e., input supply, production and distribution involving physical product flow from supplier to the end-user.

3.2 Value chain stakeholders and their functions

The different actors engaged in wheat value chain in the study area were identified and mapped as in Fig. 1. It can be seen that the actors engaged in the wheat value chain were input suppliers, farmers, commission agents, wholesaler, retailers, processors and consumers. All these actors have formed a chain and perform as elements of the wheat value chain.

Different actors involved in the wheat value chain were as follows:

Input Suppliers: Agricultural inputs primarily seed, fertilizer and agrochemicals have enormous potential to leverage the efforts of hard-working farmers. Private and government agencies were the main source of input supply in the study area (Fig. 1). Private input supplier including seed dealers, seed companies, small retail shops which sell small quantities of seed,

fertilizers and plant protection chemicals to farmers at the village level while government agencies includes KVK and state Agriculture Department.

Producers: Wheat growers were the main actors who perform most of the value chain activities right from farm inputs purchasing for their farms or procurement of the inputs from other retail sources to post harvest handling and marketing of the produce.

Commission agent: Traders/Commission agents were the key actors of the wheat value chain who are involved in trading wheat from production pocket to the wholesale markets. Their trading functions include: buying and assembling, cleaning, selling to middlemen, transporting and selling to wholesale markets.

Processors: Processors were involved in buying wheat from collectors and producers in larger volume and supplying them to retailers and consumers. Their trading activities includes were buying the produce, cleaning, packing, selling to consumers, transporting and selling to retail markets. They have better storage, transportation and communication facilities.

Wholesalers: Wholesalers were primarily concerned in purchasing wheat in greater quantities from farmers and collectors and distributing it to retailers and consumers. According to the survey's results, the primary locations for assembling wheat in each area were wholesale marketplaces. Compared to other commission agents, they have superior access to storage, transportation, and communication.

Retailers: The last connection between producers and consumers were retailers. They mostly purchase from wholesalers and sell to customers in urban areas. In certain cases, they might also purchase straight from the producers. Customers typically purchase goods from merchants because they respond to their needs and the spending power of their customers.

Consumers: Consumer is an individual who buys products or services for personal use and not for manufacture or resale. Consumer is an end user in the value chain of wheat.

3.3 Degree of Value Addition

As raw wheat grain moves along the chain and changes hands, the value of raw wheat grains gets altered and this process is termed as value addition. Value addition in wheat refers to the process of transforming raw wheat into higher-value added products through various methods. The process of value addition starts at the stage of village commission agents or wholesalers or processors because the farmer does not add any value to the raw wheat grains at farm level.

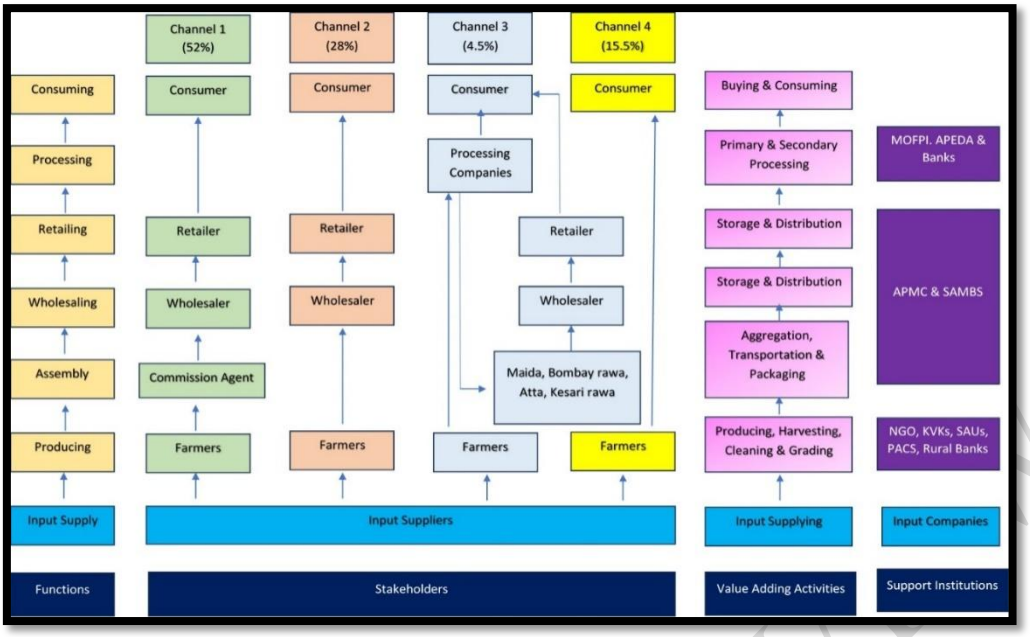

Fig. 1: Value chain map of wheat in the study area

In the present study, the degree of value addition on raw wheat grains and primary processed products were analyzed and presented in Table 1 and Table 2. The degree of value addition was computed by taking into account the product's price variation. After deducting the cost from the price difference, the margin was calculated. To calculate the value addition, the margin that was obtained was divided by the purchase price. This figure was stated as a percentage in order to determine the extent of the product's value addition.

The percentage value addition by each player was calculated by dividing the margin of the product at each stage with the sum of margins at all the stages of value addition. The figure thus arrived was expressed as a percentage to arrive at the percentage value addition.

3.4 Degree of Value Addition for raw wheat grain in the study area

The degree of value addition of raw wheat grains in three different marketing channels is presented in Table 1. In channel-I, the degree of value addition at village trader was 4.20 per cent followed by 6.42 per cent at wholesaler level and 11.14 per cent at retailer level. In case of channel-II, the degree of value addition at wholesaler level was 6.55 per cent followed by 11.34 per cent at retailer level. In channel-III, the value addition was done only by processing unit which was 8.05 per cent of the purchase price. The results revealed that degree of value addition on raw wheat grains in retailer level was maximum (11.14 % and 11.34 %) in channel-I and channel-II respectively. Because quantity sold through retailer was less as well as more risk regarding spoilage of produce also. In case of channel-III, degree of value addition was done by processing unit which was 8.05 per cent. It was due to high investment cost of the processing unit.

Table 1: Degree of value addition for raw wheat grain in the study area

(₹ /quintal)

Stakeholders	Purchase price	Sale price	Gross value addition	Marketing cost	Net Value addition	Degree of value addition

						(%)
Channel-I						
Village Trader	2513.25	2682.99	169.74	64.13	105.61	**4.20**
Wholesaler	2682.99	2922.44	239.45	67.09	172.36	**6.42**
Retailer	2922.44	3324.69	402.25	76.69	325.56	**11.14**
Channel-II						
Wholesaler	2630.34	2869.79	239.45	67.09	172.36	**6.55**
Retailer	2869.79	3272.04	402.25	76.69	325.56	**11.34**
Channel-III						
Processing unit	2740.52	3123.79	383.27	162.41	220.86	**8.05**

Note: Channel-I: (Producer → Village trader → Wholesaler → Retailer → Consumer)
Channel-II: (Producer → Wholesaler → Retailer → Consumer)
Channel-III: (Producer →Processing Companies →Consumer)

3.5 Degree of value addition for Maida, Bombay rawa, Atta and Kesari rawa in the study area

The degree of value addition for Maida, Bombay rawa, Atta and Kesari rawa in the study area was represented in Table 2. For Maida, the degree of value addition was high at processing unit level which was 17.65 per cent, followed by 7.15 per cent at retailer level and 4.19 per cent at wholesaler level. In the case of, Bombay rawa also the degree of value addition was high at processing unit level which was 15.19 per cent, followed by 6.13 per cent at retailer level and 3.78 per cent at wholesaler level. With respect to Atta and Kesari rawa also the degree of value addition was high at processing unit level which was 24.80 and 16 per cent respectively, followed by 7.34 and 6.05 per cents respectively at retailer level and 4.86 and 4.30 per cents respectively at wholesaler level. The results revealed that, the degree of value addition was higher at processing unit level which was 17.65, 15.19, 24.80 and 16.00 per cent followed by 7.15, 6.13, 7.34 and 6.05 per cent at retailer level and 4.19, 3.78, 4.86 and 4.30 per cent at wholesaler level for the primary processed products like Maida, Bombay rawa, Atta and Kesari rawa respectively. Processing units' owners were earning more profit because they required huge investment and plenty of resources. While retailers were earning more profit per quintal as compared to wholesalers. However, the quantity sold through wholesalers were huge as compared to retailers.

4. CONCLUSION

This paper maps and analyses value chain for wheat in Karnataka state. The results revealed that degree of value addition on raw wheat grains in retailer level was maximum (11.14 % and 11.34 %) in channel-I and channel-II respectively. Because quantity sold through retailer was less as well as more risk regarding spoilage of produce also. In case of channel-III, degree of value addition was done by processing unit which was 8.05 per cent. It was due to high investment cost of the processing unit. With respect to four primary processing products value addition results, processing units were substantially contributing more value addition as compared to other two intermediaries. Because, processing units' owners required huge capital investment and plenty of resources. While retailers were earning

more profit per quintal as compared to wholesalers. However, the quantity sold through wholesalers were huge as compared to retailers.

5. FUTURE SCOPE

This paper will assist policymakers and processing companies by projecting future demand for wheat and its products. Agricultural marketing is vital not only for encouraging production but also for hastening economic development. An effective marketing system increases farmers' revenue and expands product markets by transporting them to remote areas of the country. Wheat-processing units offer a wide range of job opportunities to local community. By acquiring high-quality raw materials and using new technologies, processing units' utilization of capacities may be raised.

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Table 2: Degree of value addition for Maida, Bombay rawa, Atta and Kesari rawa in the study area

(₹ /quintal)

Stakeholders	Purchase price	Sale price	Gross value addition	Processing/Marketing cost	Net Value addition	Degree of value addition
Maida						
Processing Unit	2336.33	3423.19	1086.86	674.29	412.57	**17.65**
Wholesaler	3423.19	3680.14	256.95	113.20	143.75	**4.19**
Retailer	3680.14	4026.76	346.62	83.47	263.15	**7.15**
Bombay rawa						
Processing Unit	2336.33	3371.52	1035.19	680.26	354.93	**15.19**
Wholesaler	3371.52	3612.35	240.83	113.20	127.63	**3.78**
Retailer	3612.35	3917.32	304.97	83.47	221.50	**6.13**
Atta						
Processing Unit	2336.33	3596.15	1259.82	680.26	579.56	**24.80**
Wholesaler	3596.15	3884.17	288.02	113.20	174.82	**4.86**
Retailer	3884.17	4253.10	368.93	83.47	285.46	**7.34**
Kesari rawa						
Processing Unit	2322.87	3271.31	948.44	576.70	371.74	**16.00**
Wholesaler	3271.31	3525.22	253.91	113.20	140.71	**4.30**
Retailer	3525.22	3822.15	296.93	83.47	213.46	**6.05**