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Value Chain Analysis of Leather Manufacturing in Thirupathur District of Tamil Nadu, India

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Value chain analysis for leather includes number of value addition activities and various stakeholders. A study was conducted to understand the value chain and market efficiency of leather products was done at Thirupathur district, as it is a major area for leather manufacturing. In Thirupathur district, three taluks were taken for the study with thirty livestock farmers, thirty wholesalers, thirty retailers and thirty leather processing industries were contacted based on simple random sampling. The purpose of the study is mapping and analysing the market efficiency of leather processing in, three major channels were found in this study area. Results show that channel I was the most efficient analysed by both Shepherd's and Acharya's market efficiency method as it is the shortest channel. Channel II and III were less efficient channels. The main constraint faced by the leather processing industries were poor drying facilities, unavailability of skin and hides throughout the processing year.

Keywords: Constraints; marketing efficiency; price spread; value chain map.

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1. INTRODUCTION

Leather value chain starts from rearing of animal husbandry and ends with the manufacturing the leather goods. Bovine hides, sheep and goat skins are the major hides used and are processed in tanneries before becoming leather footwear, garments and accessories like travel bags and belts. Leather is also used for technical products and upholstering [1,2].

Leather and its products are unique items, known for their versatility, style, and fashion. In Asian countries, due to the growing affluence of population there are good prospects for sustainable development of the leather industry in the long run. Comparative advantages like raw material availability and low labour cost, coupled with environmental considerations have contributed to a shift in bringing the processing segment of the leather sector value chains towards the developing countries [3-5]. In 2020, the major global exporters of leather were Italy, the United States of America, Brazil, China and Germany. Italy exported around 2.9 billion U.S dollars of leather to the rest of the world and followed by United states with 1.12 billion U.S dollars and also other than some of the EU countries like Italy and Spain, most of the European countries serve as final export destinations [6].

In addition, key customers as well as consumer categories in the global value chain of leather and leather products are located in the USA, Australia, and Japan. Hong Kong has also emerged as a large global importer of semi-finished and finished leather for value addition and export [7,8]. This provided an opportunity for India and other developing countries for a better positioning in the global trade.

1.1 Leather Industry

In India, the leather and leather products are well-known for consistently strong export revenues and are one of the country's top ten foreign exchanges. In the 2020-21 fiscal year, India exported $3.68 billion worth of leather and leather goods including saddlery and harnesses. In 2020, India has 20 percent of the cow and buffalo population and 11 percent of the goat and sheep population in the world and it also had a plentiful supply of raw materials [9,10]. Adding to this the advantages of trained manpower, cutting-edge technology, increased industrial compliance with international environmental requirements, and related industries unwavering support [11,12].

In India, Tamil Nadu, West Bengal, Uttar Pradesh, Agra, Noida, and Saharanpur, Maharashtra, Punjab, Karnataka, Hyderabad, Haryana, Gurgaon, Panchkula, Karnal, Delhi, Madhya Pradesh, Kerala and Ernakulam were the key manufacturing states for footwear, leather, and leather goods in India [13].

1.2 Indian Leather Industry Advantages

India has raw material supply consisting of around 3 billion square feet of leather were produced each year. In addition, some goat, calf, and sheep skins are in high demand and they also have strong and environmentally friendly tanning foundation and there is an updated manufacturing facility.

1.3 Environmental Impact

The leather industry has an environmental impact due to carbon footprint of livestock rearing and the use of chemicals in the tanning process (e.g., chromium, phthalate esters, nonyl phenol ethoxylate soaps, pentachlorophenol, and solvents). Air pollution due to the transformation process (hydrogen sulfide is formed during mixing with acids and ammonia liberated during deliming, and solvent vapours). However environmental guidelines exist for environmental improvement in leather tanner sectors. These guidelines were provided by the Central Pollution Control Board (CPCB), the State Pollution Control Board (SPCBs), and the Pollution Control Committee (PCCs) providing guidance to the industries for the effective prevention and control of pollution to safeguard the environment.

1.4 Objective of the Study

Leather manufacturing is an important industry in Tamil Nadu mainly that are located in Thirupathur, Chennai, Ambur, Ranipet, Vaniyambadi, Vellore, Pernambut, Trichy, Dindigul, and Erode. In leather manufacturing, various value addition activities were involved so it is necessary to understand the value chain of leather industry, so this study was taken up with the following objectives

- To map the value chain of hides and to analyse the marketing efficiency of the intermediates.

- To find out the problems faced by the leather processing within the study area.

2. RESEARCH METHODOLOGY

To accomplish the above objectives, primary data were collected using a structured questionnaire. The study area was confined with in Tirupathur district of Tamil Nadu which has four taluks and five blocks where the leather and tannery industry was located mainly in Vaniyambadi, Natrampalli, Ambur taluk, and these three taluks were selected for the study. Sample respondents were selected based on a simple random sampling method. About thirty cow, goat, sheep rearing farmers and thirty wholesalers, thirty retailers and thirty leather processing industry were contacted and value chain was tracked.

2.1 Tools for Analysis

Garrett ranking was the tools used in this study (Zalkuwi et al. 2015). Garett ranking was measured by using the below formula

$$\text{Percent Position} = \frac{100\ X\ (Rij - 0.5)}{Nj}$$

Where,

Rij = Ranking given to the i^{th} attribute by the j^{th} individual
Nj = Number of attributes ranked by the j^{th} individual

In this study, Garrett ranking was used to identify the constraints faced by the leather processing industry.

2.2 Marketing Efficiency

2.2.1 Agarwal approach

According to Acharya (2003), an ideal measure of marketing efficiency, particularly for comparing the efficiency of alternate markets channels should take into account all of the following:

a) Total marketing costs (MC) b) Net marketing margin (MM) c) Prices received by the farmer (FP) d) Prices paid by the consumer (RP)

Further, the measure should reflect the following relationship between each of these variables and the marketing efficiency.

i) Higher the total marketing costs, the lower the efficiencyii) Higher the net marketing margin, the lower the efficiencyiii) Higher the prices received by the farmer, the higher the efficiencyiv) Higher the prices paid by the consumer, the lower the efficiency

As there is an exact relationship among the four variables, *i.e*., a+ b+ c = d, any three of these could be used to arrive at a measure for comparing the marketing efficiency (ME).

The following measure is suggested by Acharya (2003)

ME = FP ÷ (MC + MM)

2.3 Shepherd's Formula

Marketing efficiency is a measure of market performance. The movement of goods from producers to the ultimate consumers at the lowest possible cost consistent with the provision of service desired by the consumers is termed as efficient marketing.

Efficiency of supply chain was calculated with the help of the following formula. The higher this ratio, higher would be the efficiency and vice versa. This can be expressed in the following form:

ESC = [(V/I)-1]

Where,

ESC=Index of Efficiency of Supply ChainV = Value of goods soldI = Total marketing cost

3. RESULTS AND DISCUSSION

3.1 Value Chain Mapping of Hide

The value chain mapping of hide had three channels with channel I beginning with farmers (43.5 percent) who sold the cows to the slaughter house. From there meat is sold to the direct consumers and skins are sold to the wholesalers. The skins from the slaughter house are collected in bulk and are preserved by adding salt to them; and after preservation, the resultant skins are sold directly to the leather industry. In channel II, livestock dealer is involved. Farmers (27.4 percent) sell the cows to the livestock dealer who then sell them to the slaughterhouse and value chain is followed. In the case of channel III (29.1 percent farmers) where the collector collected the skins from the slaughter house and sends them to the supplier who in their turn sent them

to the retailers in each step the skins are preserved by adding chemicals and salt. Channel I was followed by 13 respondents, Channel II followed by 8 respondents and finally channel III was followed by 9 respondents most of the intermediates follows channel I because is it efficient. Results are discussed in Table 1 and depicted in Fig. 1 herein.

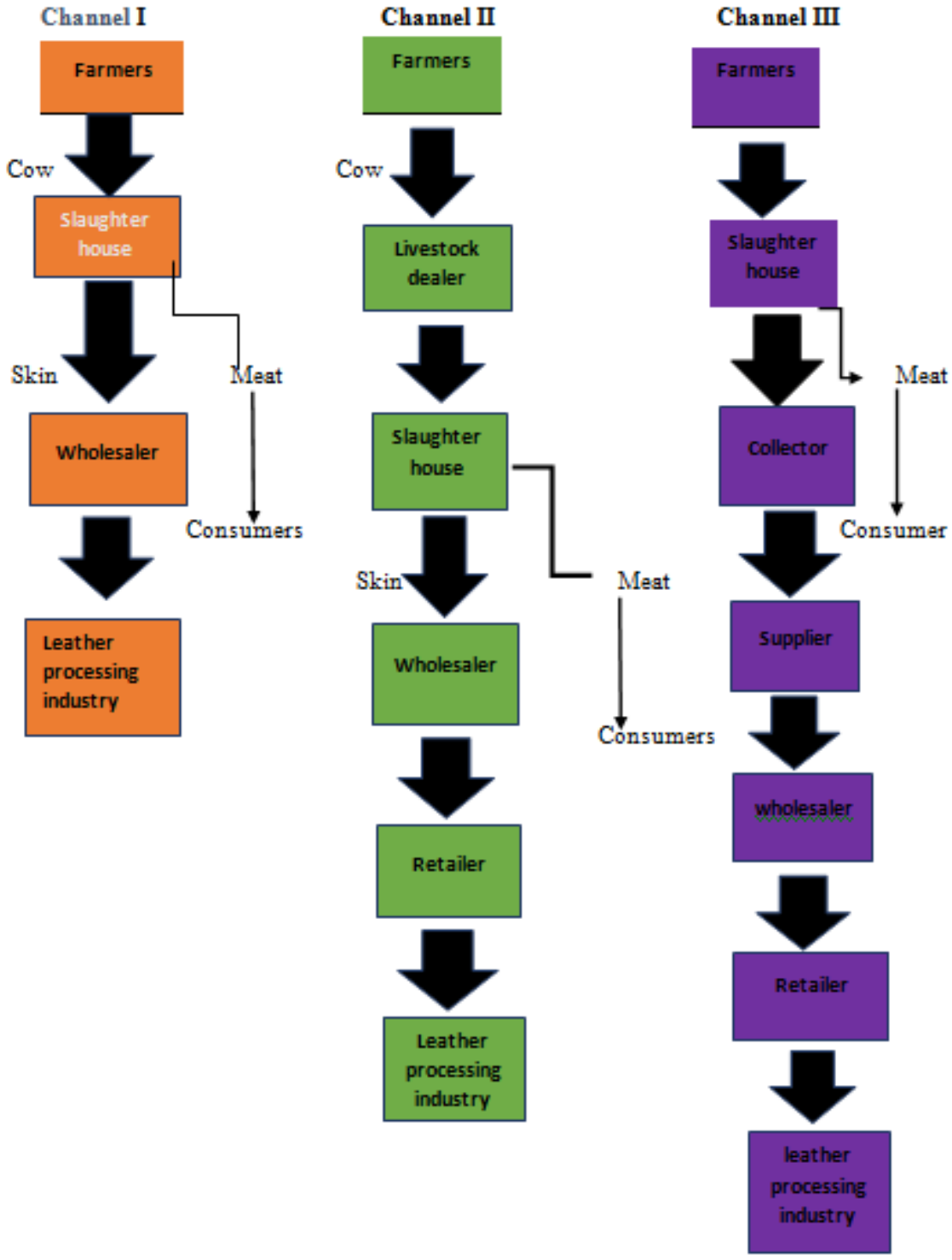

Fig. 1. Mapping of hide
(Source: primary data)

3.2 Price Spread Analysis

The study of price spread helps to understand the value chain cost and the problems faced. Price spread followed Kumaravel's (2005) approach. The three different major channels were traced through mapping of value chain of hide and presented in Table 1.

Table 1. Price spread for channel I, II, III for hide (per unit)

		Channel I	Channel II	Channel III
S. No	**Particulars**	**Amount (Rupees/skin)**	**Amount (Rupees/skin)**	**Amount (Rupees/skin)**
1	**Producers/Farmers**			
	Gross price received/unit	8(25)	8.2(25)	8.5(25)
	Net price received/unit	200.00 (33.33)	205.00 (32.03)	212.5 (34.2)
2	**Livestock dealer**			
	Purchase price/unit	-	205.00 (32.03)	-
	Holding cost	-	0.2 (0.03)	-
	Transport	-	0.4 (0.062)	-
	Margin /skin in Rs	-	31.9 (4.98)	-
	Sales price	-	237.5 (37.1)	-
3	**Slaughter house**			
	Purchase price	200.00 (33.3)	**237.5 (37.1)**	212.5 (34.2)
	Raw hide	200 (33.33)	237.5 (37.1)	212.5 (34.2)
	Labour cost	15 (2.5)	15.2 (2.37)	15 (2.41)
	Transport	2 (0.33)	2.2 (0.34)	2 (0.35)
	Margin @Rs/skin	8 (1.33)	5.1 (0.79)	0.5 (0.80)
	Sales price	225 (37.5)	260.00 (40.6)	230.00 (37.00)
4	**Collector**			
	Purchase price	-	-	230.00 (37.00)
	Transport	-	-	1 (0.16)
	Margin @Rs /skin	-	-	1 (0.16)
	Sales price	-	-	232.00 (37.4)
5	**Supplier**			
	Purchase price	-	-	232.00 (37.4)
	Transport	-	-	1.8 (0.29)
	Loading and unloading	-	-	1.3 (0.20)
	Marketing cost	-	-	3.1

S. No	Particulars	Channel I Amount (Rupees/skin)	Channel II Amount (Rupees/skin)	Channel III Amount (Rupees/skin)
				(0.5)
	Margin @Rs /skin	-	-	4.9 (0.79)
	Sales price	-	-	240.00 (38.7)
6	**Wholesaler**			
	Purchase price	225 (37.5)	260.00 (40.6)	240.00 (38.7)
	Loading & unloading	1.5 (0.25)	1.6 (0.25)	1.8 (0.29)
	Transportation	3 (0.5)	3.2 (0.5)	3.5 (0.56)
	Processing cost	36.5 (6.08)	37.3 (5.82)	37.7 (6.08)
	Marketing cost (L+T)	4.5 (0.75)	4.8 (0.75)	5.3 (0.85)
	Margin @Rs/skin	9 (0.15)	2.7 (0.4)	6.5 (1.04)
	Warehousing cost	10 (1.66)	10.2 (1.5)	10.5 (1.69)
	Sales price	285.00 (47.5)	315.00 (49.2)	300.00 (48.38)
7	**Retailer**			
	Purchase price	-	315.00 (49.2)	300.00 (48.38)
	Transport	-	2 (0.31)	2.4 (0.38)
	Loading and unloading	-	1.5 (0.23)	1.5 (0.23)
	Storage cost	-	3.5 (0.54)	9.2 (1.48)
	Marketing cost(L+T)	-	3.5 (0.54)	3.9 (0.62)
	Margin @Rs/skin	-	13 (2.0)	3.9 (0.62)
	Sales price	-	335.00 (52.34)	317.00 (51.1)
8	**Leather processing industry**			
	Purchase price	285.00 (47.5)	335.00 (52.34)	317.00 (51.1)
	Labour cost	115.5 (19.2)	116 (18.12)	120 (19.3)
	Sorting, grading	9 (1.5)	9.5 (1.48)	10 (1.61)
	Quality testing	36.5 (6.08)	37.6 (5.87)	37.8 (6.09)
	Reworking of rejection	53.2 (0.88)	53.2 (8.31)	53.5 (8.62)
	Packaging	45 (7.5)	45.1 (7.04)	45.5 (7.33)
	Marketing cost (S+P)	54 (9)	54.6 (8.53)	55.5 (8.95)
	Technology and development	14 (2.33)	14.2 (2.21)	14.5 (2.33)

S. No	Particulars	Channel I Amount (Rupees/skin)	Channel II Amount (Rupees/skin)	Channel III Amount (Rupees/skin)
	Firm and infrastructure cost	19 (3.16)	19 (3.00)	19.3 (3.11)
	Margin @Rs/skin	22.8 (3.8)	10.4 (1.62)	2.4 (0.32)
	Sales price	600.00 (100.00)	640.00 (100.00)	620.00 (100.00)
	Price paid by leather processing industry	600.00 (100.00)	640.00 (100.00)	620.00 (100.00)

From Table 1, Channel I shows that farmers received a net payment of Rs 200/skin and then sold it to the slaughterhouse who purchased the skin for Rs 200 and then sold to the wholesaler for Rs 225. Transportation, loading and unloading charges were incurred by the wholesalers. So, the wholesaler played a major role in deciding about the increase of the price from Rs 225 to Rs 285 or higher by (47.5 per cent) of the purchase price was incurred by the leather industry in the channel I.

In Channel II farmers received a net payment of Rs 205/skin and then it moved to the livestock dealer. They were playing a major role in fixing price from Rs 205 to Rs 237 before sending the wholesaler.

In Channel III involved farmers, slaughter house, collector, supplier, wholesaler, retailer and leather processing industry. The slaughter house fix the price before supplying to collector from Rs 212.5 to Rs 230. According to the Table 1, the price difference was Rs 600/skin, Rs 640/skin and Rs 620/skin for channel I, channel II and channel III respectively.

3.3 Marketing Efficiency Analysis

Market performance is measured by marketing efficiency. The movement of goods from farmers to the end processing unit at lowest possible cost with the service provision preferred by the processing is termed as efficient marketing. The marketing efficiency of different channels was estimated using two methods, namely.

i. Shepherd's method
ii. Acharya's approach

According to Shepherd's method, increased product value at lower marketing cost establishes higher efficiency. Where as in Acharya's approach higher efficiency is established when only the price received by farmers is higher if compared with total marketing cost and total marketing margin. Hence, it would be an ideal way to calculate marketing efficiency

More than one method was used to check the accuracy of efficiency. Manivenkatesh (2017) in his study on the value chain analysis used a similar method. The result is presented in Table 2.

From Table 2 it could be inferred that channel I i.e., Farmers-Slaughter house -Wholesaler-Leather processing industry was the most efficient channel as it had the highest marketing efficiency when compared to other channels. It is evident from the value chain that there was the processing of leather in the Thirupattur district and all hide was processed into leather and leather products. After an intense search it became clear that there was processing at all levels when it comes to leather processing, indicating that this value chain opportunity remains tapped. It shows that there was a huge opportunity lurking behind leather processing.

3.4 Problems Faced by the Leather Processing Industries

The various problems faced by the stakeholders were analysed and presented in this section.

3.5 Constraints faced by the Sample Respondents towards Leather Processing

The constraints faced by the sample respondents in leather processing were analysed using Garrett's ranking technique and are presented in Table 3 and it gave a clear picture about the problems faced by the industry.

Table 2. Marketing efficiency -Shepherd's and Acharya's approach for hide

Sl. No	Particulars	Channel 1	Channel 2	Channel 3
I	Value of goods sold (in Rupees)	600.00	640.00	620.00
ii	Total marketing cost	123.7	132.6	143.5
A	Shepherd's marketing efficiency [(i/ii)-1]	3.85	3.82	3.32
iii	Total marketing cost	123.7	132.6	143.5
iv	Net marketing cost	39.8	63.1	19.2
V	Net price received by farmers	200	205	212.5
B	Acharya's marketing efficiency [v/(iii +iv)]	1.22	1.04	1.03

Table 3. Constraints faced by the leather processing industry (n=30)

S. No	Constraints	Total score	Mean score	Rank
1	Poor drying facility during rainy days	2023	20.23	I
2	Non availability of skin and hide round the year for processing	1706	17.06	II
3	Scarcity of labour	1515	15.15	III
4	Non availability of storage facility for skin and hide	1441	14.41	IV
5	High electricity cost	1175	11.75	V

Poor drying facility during rainy days was the major constraint faced by the industry and is ranked first. The industry felt that at non availability of skin and hide round the year for processing was another constraint followed by the scarcity of labour. These are some of the constraints faced by the industry like lack of storage facility and high electricity costs

4. CONCLUSION

The value chain of hide had three different channels and channel I was the most efficient one with the marginal profit gained by the leather industry was Rs 22.8 (3.8 percent). Channel I had a marketing efficiency score of 3.85 and 1.22 from Shepherd's and Acharya's methods respectively. Skilled labour, procurement of high-quality leather, well- equipped machineries, and adhering to the environmental guidelines were necessary for the successful operation and also resulting in quality leather. Poor drying facility especially the during the rainy season was the major problem faced by the leather industries in the study area. The policy makers can take efforts to adopt advanced technologies and infrastructure facilities to address the issues faced by the leather manufacturers.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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