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## Marketing chain of neem seeds in Tamil Nadu

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#### Abstract

Agriculture sector is now becoming a major consumer of the neem products viz. Neem oil, neem cake and neem based pesticides. Being eco-friendly and natural source of phyto-chemicals and nutrients it is preferred to apply Neem manure and pesticide in agriculture especially in organic farming all over the world. The present study was conducted in Tamil Nadu stating covering seven districts namely Coimbatore, Dindigul, Dharmapuri, Madurai, Sivagangai, Thoothukudi and Vellore. Neem seed collectors and Neem cultivating households sell their Neem seeds to different type of traders like Village Merchants, Commission Agents, Oil Mills and the retail shops at their villages. Among these, the village merchants receive Neem seeds accounted for 62 per cent to the total followed by 17 per cent of the households that were able to sell the Neem seeds directly to the Oil Mills located in nearby villages while they were paying a visit to the weekly market for purchase of groceries and procure the neem based oil for kitchen use from the oil miller. Among the five chains, the price spread is very low in respect of Chain – II which had only 36 per cent of spread followed by Chain – IV which had 41 per cent of price spread between the consumer and the collector and hence the these two chains can become the best for the collectors and the consumers.

**Keywords:** Agriculture, azadirachtin, neem oil, neem cake, pesticides, traders

#### Introduction

The demand of Neem products are increasing day by day. Agriculture sector is now becoming a major consumer of the neem products viz. Neem oil, neem cake and neem based pesticides. Being eco-friendly and natural source of phyto-chemicals and nutrients it is preferred to apply Neem manure and pesticide in agriculture especially in organic farming all over the world. As global demand for azadirachtins as an organic crop protection solution is steadily rising, the manufacturers of azadirachtin, neem oil & neem cakes are continuously working to improve upon their production capabilities for more profitability. The organizational improvements in quality production should involve all the stake holders in the value chain of neem product preparation. Agriculture, while being important, is gradually ceasing from being a principal income generating activity for women and it is only during the harvest season, anywhere between three to five months in a year, that these rural poor have a possibility of a source of income that too after taking up travel to distant districts and villages. During the post-harvest dormancy period, ad-hoc daily-wage jobs become an essential alternative for survival of this community. It is during this period that the women folks attempt to pick and collect the neem seeds. Incentives for neem seed collection-in keeping with the current economic realities- must be strengthened along with organizational improvements for marketing of neem seeds. Organizational, financial inputs and a policy for integrating neem in the framework of agriculture, rural and small industries policies is needed in order to realize this potential. Adequate supply of good quality neem seeds in a timely fashion is critical for the commercial success of Neem. In India, facilities already exist for extraction of oil from neem seeds. It is possible to use the pre-existing facilities for obtaining bitter extracts. However, unlike in the case of oil extraction, to get good quality Neem active extracts, the extraction procedures have to be of high standards. Proper care has to be taken in handling seeds at various stages including procurement, drying and storage. Keeping this wider perspective in mind, the research aims to identify the major market chains and costs involved in neem value addition in Tamil Nadu.

#### Review of Literature

Girish and Shankara (2008) [3], in their study named Neem: A green treasure, discussed various uses of Neem in the field of Ayurveda.

Neem has been used in the field of Ayurvedic medicine since more than 4000 years. It is because of the medicinal properties which Neem possess in each and every part of it. The Neem plant has been called as the 'arista' in Sanskrit. Saini (2011) [5], in the study about Ayurveda and herbs in dental health, indicated the use of Neem twigs as a tooth brush endorsed by the dentists to prevent the caries. A separate mouth wash produced out of Neem is also used as it is reported to inhibit the growth of *S. mutans* and carious lesions. From the primeval times, Neem has been a noteworthy common tree species in India due to its multifunctional uses like Medicinal, Bio-fertilizer, Fumigant, Bio-pesticides, Oil Seeds, and Cattle feed with various ecological and environmental benefits (Lokanadhan *et al.*, 2012) [6]. In India, research on Neem oil and Neem cake began in 1920s at the Indian Institute of Science in Bengaluru followed by in 1960, Neem Insecticidal properties at the Indian Agricultural Research Institute, New Delhi which is credited for controlling locusts by spraying with Neem kernel extract (Dinesh *et al.*, 2015) [7]. According to Balaji (2017) [1], Neem cake can be used as fertilizer for the cash crops like sugarcane and vegetables. Because of the limonoids in the Neem cake it helps in protecting the roots from the nematodes and white ants. The leaves and twigs can be puddled in paddy field before raising the crop. Although India is in an enviable position for the neem industry because of its high quality of oil and seeds and abundant raw materials, the neem industry has not grown as expected. Problems in export exist due to regulatory restrictions in several countries and it is better to concentrate in Indian market. Recurrent problems in exporting and marketing are polluted and contaminated products, with lead and aflatoxin in the oil (Rashmi Roychoudhury, 2016) [4]. The Government of India in the year 2015 has introduced a New Fertiliser Policy which makes it mandatory for manufacturers and importers to spray neem seed oil over urea

before releasing it to farmers The Fertilizer Ministry has set a standard for producing neem coated urea, which requires 600 gram of neem oil to be sprayed on 1 tonne of urea. Going by the standard it is required at least 20,800 tonnes of neem oil for coating 32 million tonnes urea consumed in the country every year. But every year 30,000 tonnes of neem fruits are collected across the country. Only 10 per cent of it gets processed for oil (Down to earth, 2019) [2]. But there is lack of quality control and an inability to fulfill Indian demand of 1.5 lakh tonnes per annum (Down to earth, 2019) [2].

## Methodology

### Sampling Design

The present study was conducted in Tamil Nadu stating covering seven districts namely Coimbatore, Dindigul, Dharmapuri, Madurai, Sivagangai, Thoothukudi and Vellore. For the purpose of the study, a multi-stage sampling procedure was followed. In the first stage, based on the major market centres for neem seeds, nine blocks were selected covering seven districts and the nine blocks were grouped into three clusters based on movement of neem seeds for sale. Nine blocks namely Cluster 1: Harur, Tirupathur & Pennagaram (for Krishnagiri), Cluster 2: Puliampatti (for Annur), Ottanchadram and Dindigul and Cluster 3: Melur, Singampunari and Kovilpatti were purposively selected. These blocks are the major market centres where local traders, oil mills, mandi and oil retail shops were approached to get information on the raw materials sources. Based on the oral enquiry, one block which acts as major source of neem seed collection was selected and two villages were identified based on further follow up information. In the **second stage**, based on the area two villages were selected in each block. Thus a total of 18 villages were selected spread across 9 blocks (Table 1).

**Table 1:** Sampling Framework

Name of the districts	Cluster	Blocks	Name of Villages
Vellore	Cluster I	Tirupathur	Vishamangalam Perampattu
Dharmapuri		Harur	Kavundampatti Sundagipatti
Coimbatore	Cluster II	Pennagaram	Sikanampatti Puthur
Dindigul		Puliampatti	Ellampalayam V.Palayam
		Oddanchatram	Perumalkoivilvalasu Naganampatti
		Dindigul	Dhasarpatti Porulur
Madurai	Cluster III	Melur	Thumbaipatti Puthupatti
Sivagangai		Singampuneri	Piranmalai Anaikaraipatti
Tuticorin		Kovilpatti	Ilpaiurani E.pannai
Total	Districts: 7	Blocks: 9	Villages: 18

In third stage, market functionaries, neem seed collectors were selected employing simple random sampling. A sample of 25 households in each village who involved in neem seed collection were selected with 150 rural households were studied in each cluster. Thus, a total of 450 households involved in neem seed collection was selected and studied and ten traders/processors in each block were interviewed and a total of 100 traders/processors were interviewed. Well defined and pretested interview schedule was used to collect primary data from the rural households.

### The Period of Study

The reference year of the study is the agricultural year 2020-21. The primary data were collected from the sample respondents from September to December 2020 and the data were related to the year 2020-21.

### Tools and Techniques

Market related Information were collected from the individual farmers and traders. The costs included the transport, weighing, loading and unloading, packing, storage, spoilage, commission charges and other expenses incurred for marketing the produce. In the process of marketing of Neem seeds, the difference between price paid by the consumer and the price received by the Neem seed producer for an equivalent quantity of Neem seed was defined as "Price Spread". Profits of the various market functionaries involved in moving the produce from the initial point of production till it reaches the ultimate consumer were recorded. In general, Sum-of-Average Gross Margin method was used in the estimation of price spread.

**Collector’s Share in the Consumers’ Rupee**

Further, the Farmer’s share in consumers’ rupee was calculated with the help of the following formula.

$$CS=(COP/CP)*100$$

Where,

CS= Collector’s Share in the Consumers’ Rupee (percentage)

COP = Collector’s Price

CP= Consumer’s Price

**Market Chain of Neem**

Market Chain identification is a process that identifies the main activities associated with a company’s service or product line and is often used in corporate strategy in order to identify performance improvement opportunities. This process usually begins by grouping the main supplier of seeds

to the oil mills with customer groups that represent the mill’s key business inputs and outputs. Looking at the top suppliers and significant product lines is often a good place to start for oil mills who are intend to produce Neem seeds. Once the value chain is identified according to the inputs and output needs, one can create impacts in different areas like environmental, social and economic which is warranted in the business entity.

**Results and Discussion**

**General Characteristics of Neem Traders**

This is important to discuss the experience and role of traders involved in neem seed collection and marketing. The type of traders may be different for farm produced goods and Neem based products and hence effort has been made to assess the type of traders involved in getting the Neem seeds from the Neem seed collectors. The results are presented in Table 2.

**Table 2:** Profile of Traders in Neem Markets

Sl. No	Buyers	No. of Sample Farmers/ Seed collectors	Average Experience in Neem Marketing
1	Village Merchants	62	25
2	Commission Agents	11	12
3	Traders Selling to Oil Mills	17	9
4	Village Retail Outlets/Mandies	10	35
	Total	100	23.5

Neem seed collectors and Neem cultivating households sell their Neem seeds to different type of traders like Village Merchants, Commission Agents, Oil Mills and the retail shops at their villages. Among these, the village merchants receive Neem seeds accounted for 62 per cent to the total followed by 17 per cent of the households that were able to sell the Neem seeds directly to the Oil Mills located in nearby villages while they were paying a visit to the weekly market for purchase of groceries and procure the need based oil for kitchen use from the oil miller. The role of Commission Agent in procuring the Neem seeds accounted for 11 per cent followed by 4 per cent of the traders who had established small procurement centers in addition to the regular grocery selling in the village itself and procures the Neem seeds for getting some additional gain in the trade. In this respect, one would be interested in learning their experiences gained in procurement and distribution of Neem seeds. Traders /Village merchants had gained an experience of 25 years. Most of the commission agents had 12 years of experience might be due to their late entry into the business after realizing the importance of Neem and its products. The average experience of the traders is 23.5

years.

**Marketing Chains in Neem Based Products**

The Indian Neem extract market will be observing a constant growth in the forthcoming years due to the large Neem production and demand for healthier and herbal goods in the country. Three broad application segments of the Indian Neem extract market are animal, health and personal care segment and agriculture. In respect of agriculture, the product types available are leaf extract, bark extract, seed extract. Seed extract has been the largest revenue generator in recent years. Neem extract is generally used in three types of bio-pesticides like herbicides, insecticides and fungicides. Neem extracts are widely used as pesticides by households for home gardening and in the case of small-scale gardening. All these activities and product preparation and distribution command a defined chain of disposal. These defined pathways by which different Neem based products move from the producer to the ultimate consumers are identified in the study environment and the details are presented in Table 3.

**Table 3:** Market Chains of Neem Seeds

	Market Chains
I	Seed Collector -Village Merchants - Processors (Oil Mills) - Industrial Consumers
II	Seed Collectors - Processors (Oil Mills) - Consumers
III	Seed Collectors - Processors (Oil Mills) – Retailers-□Ultimate Consumers
IV	Seed Collector - Commission Agent -Processors (Oil Mills)-Ultimate Consumers

The existence of five marketing chains in the sample environment. Chain – I transfer the Neem seeds from the Neem collecting households to the Village Merchants and then is it transferred to the oil mills who in turn extract the Neem oil and then the same is sold to the industrial consumers like Pharmaceutical industries and the cosmetics manufacturing units. Chain – II is poised to transfer the Neem seeds from the Seed collectors to the Processor preferably the Oil mills who extract the Neem oil and then the Neem oil is transferred or sold to the ultimate consumers on demand. Chain – III in which the processor (Oil Mills) takes the Neem

seeds from the seed collectors. On extraction of Neem oil, the retailers approach the oil mill outlets and take the title of goods and then the same is sold to the ultimate consumers through their retailing units located in the villages concerned. Chain – IV in which the seed collectors transfer the goods to the Commission Agent who approach the farmer at farm gate and then the commission agent supplies the Neem seeds to the Processor (Oil Mills). On extraction of the Neem oil, the same is supplied to the ultimate consumers who perform shopping for the weekly market and purchase the required oil from the Oil mill retail outlet located in the mill premises.

### Value Addition of Neem

Every Market Functionary in the marketing chain does some or part of value addition activities in moving the Neem seeds from one level to another. Value addition is vitally important to gain higher market price. The details of activities performed by each market functionary is essentially important to learn about the type of value addition, its cost involvement in each stage and benefits accrued from the value addition etc. The details are presented in Figure 1.

The details of market functionaries and their role in value addition of Neem products. The Market functionaries are Neem seed collectors, Village Merchants, Commission Agents, Processor cum Oil Miller and the Industrial / Ultimate Consumers.

Neem seed collectors or the farmers normally used to collect the seeds under the canopy. If need be, ripened fruit bearing branches were shaken to collect the fruits in a large quantity. They used to visit the floor daily or in an alternate day to collect the bird droppings and the pale yellowish and yellowish fruits were treated with cold water and de-pulped the fruits for getting good quality seeds and then they were dried under protected sunlight so that the moisture conditions could be alleviated and on storage it will not permit any discoloration with infections of Aflatoxin.

Village merchants play the role of price negotiators with the farmer or the seed collectors and fixing the price and then do procure the packing materials after fixing the price and do packing and permits transportation to the processing floor where the oil miller will receive the commodities and based on the quality of the product, the price will be offered to the village merchants.

Commission agents are the market functionaries attached with the oil milling units in most of the locations and do they visit the village and purchase the Neem seeds at the doorstep of the farmers. Based on the quality, it will be collected in different bags and the mixed seeds were graded at the floor of the commission agent and the quality seeds of Grade – I and Grade – II were supplied to the oil millers at different prices and he does the financial help to the seed collectors and the

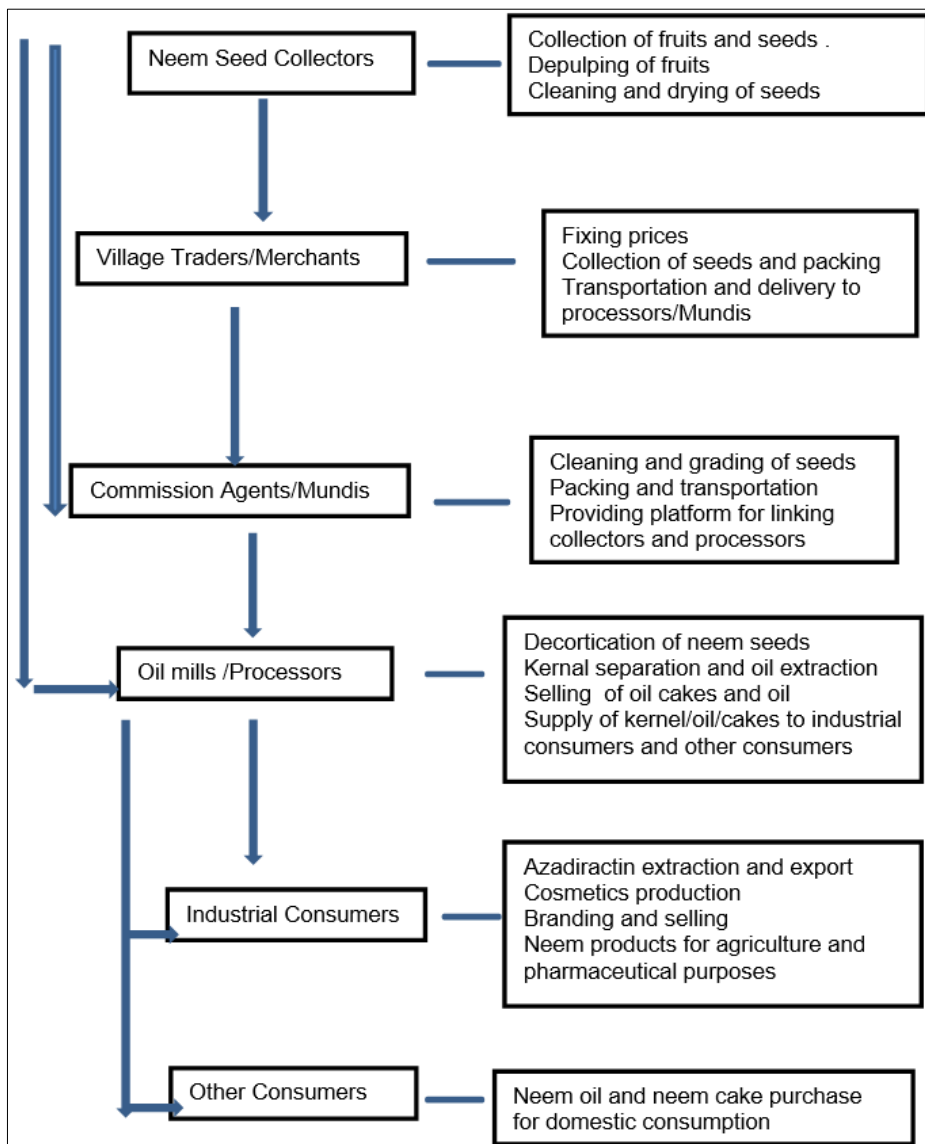
farmers whenever needed and acting as a link between the producers and the oil millers or the processors.

Processors or the Oil Millers used to do the decortication of Neem seeds and separate the Kernels. The separated kernels were crushed for oil extraction and the Neem cake is also separated. Separated Neem cake was powdered in the pulveriser and the Neem oil and Neem cake were separately packed in the containers which are branded and are respectively supplied to the industrial consumers and the ultimate consumers. Processors do supply the Neem oil to the Pharmaceutical industries and the leading manufacturers of Neem products which are delineated in a Table separately. The pharmaceutical industries prepare the Neem tablets, Neem capsules, Neem leaf powder etc.

Himalaya group of companies who are the leaders in manufacturing of such Neem capsules, Neem tablets and Neem leaf powder for the human consumption after subjecting to different tests. Value addition is a common feature in the recent times. The value addition is practiced widely because of poor price offered to the output produced either by the farmers or by the agribusiness industries or firms. Their business strategy is not to sell the raw product but to add value to the output so that they fetch higher price per unit of the produce. In this context, value addition becomes inevitable and also mainly due to the unavailability of sufficient time to the consumers because they were engaged not only with household activities but also engaged with official and social responsibilities and hence demand that arose for the instant or value-added products. Since Neem and its products are much helpful in solving the health-related problems, value addition of different parts of Neem trees are aimed at by different agribusiness firms.

Different Marketing Chains have different price spread and collector's share and are discussed individually in Chain – I to Chain – IV. To develop an overall idea about different marketing chains, summarizing the results will provide better picture about the collector's share and the price spread and hence these details are summarized in Table 5.





**Fig 1:** Participants of Neem Seed Value Chain

**Table 4:** Price Spread in Different Market Chains

Sl. No	Marketing Chain	Price Received by the Farmer	Price Paid by the Consumer	Price Spread	Per Cent
01	Chain I	3500.00	6453.00	2953	45.76
02	Chain II	3900.00	6145.00	2245	36.53
03	Chain III	3900.00	6750.00	2850	42.22
04	Chain IV	3750.00	6323.50	2573.5	40.70

Among the five chains, the price spread is very low in respect of Chain – II which had only 36 per cent of spread followed by Chain – IV which had 41 per cent of price spread between the consumer and the collector and hence the these two chains can become the best for the collectors and the consumers. The

highest price spread in respect of Neem seeds is prevalent in Chain – I and hence the collector can avoid the Chain – I. the details on Collectors’ share gained in respect of distribution of Neem seeds.

**Table 5:** Collector’s Share in the Consumer’s Price in Different Market Chains

Market Chains	Price Received by the Collector	Price Paid by the Consumer	Collector’s Share (%)
Chain I	3500.00	6453.00	54.24
Chain II	3900.00	6145.00	63.47
Chain III	3900.00	6750.00	57.78
Chain IV	3750.00	6323.50	59.30

The Farmers’ share in the consumer’s rupee is in favour of Chain – II and Chain – IV when compared to all other chains. The lowest share to the collector was offered in the Chain I are considerably contributing to the collectors.

**Conclusions**

Neem collectors gain more price when they sell neem seeds instead of neem fruits. There are four major market chains available for them to sell.

The most remunerative market chain for them is chain II and Chain IV. Village merchants play the role of price negotiators with the farmer or the seed collectors and fixing the price and then do procure the packing materials after fixing the price and do packing and permits transportation to the processing floor where the oil miller will receive the commodities and based on the quality of the product, the price will be offered to the village merchants.

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