



ISSN (E): 2277- 7695  
ISSN (P): 2349-8242  
NAAS Rating: 5.23  
TPI 2021; 10(10): 2274-2281  
© 2021 TPI

[www.thepharmajournal.com](http://www.thepharmajournal.com)

Received: 15-07-2021

Accepted: 30-08-2021

**Hussain Thwalib Sherief**  
Research Scholar, Department of  
Agricultural and Rural  
Management Tamil Nadu  
Agricultural University,  
Coimbatore, Tamil Nadu, India

**K Mahendran**  
Professor, (ARM), Department  
of Social Sciences AC&RI,  
Madurai, Tamil Nadu, India

**S Moghana Lavanya**  
Associate Professor, (ARM)  
Department of Social Sciences  
ADAC&RI, Trichy, Tamil Nadu,  
India

**M Prahadeeswaran**  
Assistant Professor, Department  
of Agricultural Economics  
Tamil Nadu Agricultural  
University, Coimbatore, Tamil  
Nadu, India

**Corresponding Author:**  
**Hussain Thwalib Sherief**  
Research Scholar, Department of  
Agricultural and Rural  
Management Tamil Nadu  
Agricultural University,  
Coimbatore, Tamil Nadu, India

## Value chain mapping of organic banana certified under the participatory guarantee systems in Kerala state

**Hussain Thwalib Sherief, K Mahendran, S Moghana Lavanya and M Prahadeeswaran**

DOI: <https://doi.org/10.22271/tpi.2021.v10.i10af.8525>

### Abstract

The rising demand for organic food is gaining momentum across the globe. Organic farming has seen an increase in demand due to increased awareness of human health and environmental challenges in agriculture, as well as appealing farm revenue. However, due to the high cost of certification and the demanding certification standards, many small and marginal farmers had backed out from practicing organic farming. But with the introduction of Participatory Guarantee Systems of Organic Certification by IFOAM, these farmers have a second chance to consider switching to organic agriculture. A study on the value chain flow of PGS certified organic product is important to understand the actors, enablers and core processes involved. A normal value chain consists of a structured networks of producers, marketers, processors, and service providers (including non-governmental organizations) who combine to expand supply and the value addition through their activities. This paper attempted to identify the value chain flow of PGS certified Nendran banana in Trivandrum and Thrissur districts of Kerala state by conducting a detailed survey with the stakeholders involved. The study also identified the constraints faced by the nendran banana growers in adopting the PGS system of organic certification.

**Keywords:** Participatory guarantee system, value chain analysis, value chain mapping, Nendran banana

### Introduction

More than half of India's population depends on agriculture for their primary source of income. The Gross Value Added (GVA) by Agriculture, forestry, and fishing was estimated to be Rs.19.48 lakh crores in FY20. In FY20, agriculture and allied sectors contributed about 17.8% of India's gross value added (GVA) at current prices. According to the Ministry of Commerce and Industry, the consumer spending for food in India would grow by 6.6 per cent in 2021, following a pandemic-driven drop. The Indian food and grocery market is the sixth largest in the world, with retail accounting for 70% of overall sales. Indian food processing sector is one of the largest industries which accounted for 32 per cent of the country's overall food market and is rated fifth in terms of production, consumption, export, and estimated growth. (Indian Brand Equity Foundation, 2021) [13]. With the introduction of green revolution movement, the usage of chemical fertilizers and pesticides had been a concern for many of the Indian states and the government had realized the adverse effect of these which resulted in promotion of organic agriculture through various schemes. Organic farming and food processing techniques are multifaceted and required for the creation of a socially, environmentally, and economically sustainable food production system. Since 2014, the Government of India, through the Ministry of Agriculture and Farmers' Welfare, has been promoting organic/ natural farming through various schemes such as Paramparagat Krishi Vikas Yojana (PKVY), Organic Value Chain Development in Northeastern Region Scheme, Rashtriya Krishi Vikas Yojana, recognizing the importance of environmental and human benefits of chemical-free farming. (Yadhav, 2017) [27]

### Organic Farming in India

In recent years, organic farming has gained popularity as there is a niche market for the organic products in the metropolitan areas (Dangour, 2010) [7] According to data from the Research Institute of Organic Agriculture (FiBL) and the International Federation of Organic Agriculture Movements (IFOAM), India ranked eighth in terms of organic agricultural area and first in terms of total number of producers in 2020. (IFOAM and FiBL, 2020) [11] Now more than 40 lakh hectares.

Of land in India have been certified as organic, and more farmers are embracing the cause (APEDA, 2021) [2]. Even in developing nations like India, demand for organically grown product is increasing as people are becoming more aware of food safety and quality, and the organic method has a significant impact on soil health as it is free from chemical substances. In addition to that, there is a huge prospect for income generation for organic products in the market. (Bhardwaj, 2019) [5]

**Table 1:** Area under Organic Cultivation in India

Particulars	Area (in Ha)
Cultivated Area (Organic + In-conversion)	2657889.33
Wild Harvest Collection Area	1681295.61
Total Area (Cultivated + Wild Harvest)	4339184.93

Source: Organic Agriculture Statistics (2020-21) APEDA [1]

Moreover, there is an increase in the demand for organic food products which is projected to grow from \$177.14 million in 2021 to \$553.87 in 2026 (Research and Markets, 2021) [23]. Organic markets are one of the fastest growing sectors in the global food industry as the annual sales increased by double digits, surpassing the total growth rate of the food market. (Organic Trade Association, 2020) [18]. The growth of organic agricultural production and trade has corresponded with the expansion of national laws to establish minimum criteria for organic agriculture. This is done by building an institutional structure for certification and giving the organic label more validity (Archana, 2013) [3, 14]. Certification is used by organic producers to identify products that are approved for use in certified production throughout the supply chain (Fabiansson, 2014) [9]. Though third party certification model has guaranteed the authenticity of organic food products and helped its expansion at a global level, it has made organic food less accessible for small and marginal farmers in developing countries such as India (Zander, 2010) [28].

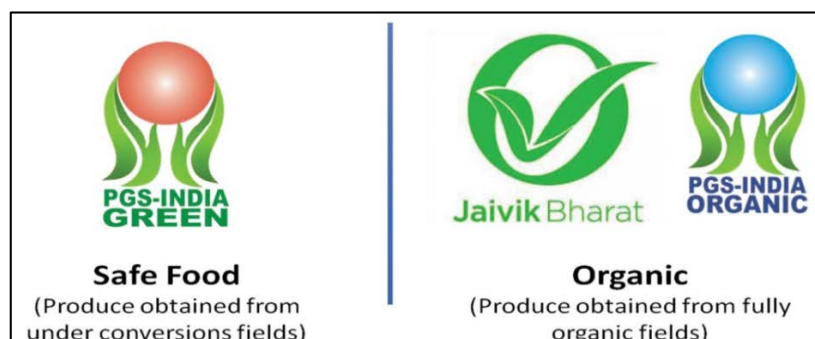
In India, the following organizations were established to identify and certify organic goods in accordance with international standards. These are "Agricultural and Processed Food Products Export Development Authority" (APEDA) for executing the National Programme on Organic Production (NPOP) - 2001 and "National Centre for Organic Farming" (NCOF) for implementing the Participatory Guarantee System in India-2016 (TPCI, 2019) [24].

There are mainly two types of Organic Certifications available in India. The first one being third-party certification which aims to regulate and promote the sale of organic products to consumers. As this system provides documentation through each step of production and process it is a major tool for assuring the quality of organic products, preventing fraud, and promoting commerce. Certain norms and rules for a uniform certification procedure have been developed by IFOAM and ISO to ensure authenticity. Currently the major Quality Certification agencies are ECOCERT, INDOCERT, LACON for approving organic certification. This certification is available to large-scale farmers and small-scale landholder growers organizations (minimum of 25 and maximum of 500 farmers who own land in the same geographical region). APEDA provides Tracenet, an internet-based e-service for collecting, recording, and reporting data on organic certification. It may also be used to track organic products from any point in the supply chain directly to the farm (TPCI, 2019) [24].

### Participatory Guarantee Systems

Participatory Guarantee Systems (PGS) is a low cost alternative method of organic certification based on an internal quality assurance which was developed on a foundation of trust, social networks, and knowledge exchange. This method of organic certification was developed by IFOAM in 2004 which enabled small and marginal farmers to get organically certified at zero or minimal cost. IFOAM defined "Participatory Guarantee Systems (PGS) as locally focused quality assurance systems that certified producers based on active participation of stakeholders and are built on a foundation of trust, social networks and knowledge exchange".

The Ministry of Agriculture and Farmers Welfare started the PGS-India initiative in 2011, with the National Centre of Organic Farming serving as its secretariat. The program has a countrywide network and is run by 309 regional councils around the country. As of September 2021, there are 41971 PGS groups with about 12 lakh farmers are associated with this program covering about 7.5 lakh hectares of area (PGS India, 2021). PGS-India has several unique characteristics, such as online traceability in the form of customer verification, a public data base, and government financial backing (Chandra, 2017) [5, 15].



**Fig 1:** Labelling of Organic Logos on Organic Products

As shown in Fig 1. there are two types of organic certifications under PGS systems. PGS India Green certificates are provided to products from farms where organic cultivation have been practiced for up to two years and under the conversion period. Most of the organic farmers in Kerala are enrolled under PGS Green category and used the

PGS-India Green logo for certifying their products. In case of PGS-India Organic, farms which has successfully completed the conversion period (two years for normal crops and three years for plantation crops) were branded with PGS-India Green logo (PGS India, 2021).

Consumer demand for organic food, particularly organic fruits

and vegetables are increasing, which encouraged farmers to use organic cultivation. This study focused on the various value chains of banana certified under Participatory Guarantee Systems and how it could help farmers in finding the right market for their products.

### Value Chain Analysis

Michael Porter conceptualized the term 'Value Chain' in his book called 'Competitive Advantage: Creating and Sustaining Superior Performance (Porter, 1985) [22]. He defined it as "a representation of a firm's value-adding activities, based on its pricing strategy and cost structure". In other words, the value chain primarily focused on the market collaboration strategy, emphasizing the effective and efficient links between production, marketing, and other operations of products and services (Kumar, Value Chain: A Conceptual Framework, 2016) [17]. An agricultural value chain can be described as the set of activities that started with obtaining inputs for production in the farmer's field to bringing the agricultural products such as fruits and vegetables to the consumer for consumption (Cuddeford, 2012) [6]. Agriculture, along with the value chain framework, has not been conceptualized in India as a primary approach for increasing efficiency, productivity, and earnings. In India, not enough attention had been put on the establishment and development of efficient agricultural value chains. Value chains in fruits and vegetables offer an alternative for agricultural diversification in terms of higher income, employment, foreign exchange earnings, and a new way to combat food security challenges. These products have a high degree of demand elasticity based on income (Kumar, 2016) [16, 17].

### Production Status of Banana in Kerala

In Kerala, the total area under cultivation was 25.71 lakh hectares out of which 52,899 hectares was under banana cultivation in the year 2019. The total yield in the same year was 4,24,048 metric tons with fresh fruits accounting for 16.57 per cent of the total yield. Among the 14 districts Thiruvananthapuram, Palakkad, and Kollam were the top three in terms of area under banana in 2018-19, with 13.78 per cent, 13.62 per cent, and 10.40 per cent respectively (Department of Economics and Statistics, 2020) [8]. The Nendran type, which is consumed as a raw fruit, cooked as a vegetable, or fried to form the popular banana chips, covered the majority of the land under production.

The purpose of this paper is to provide an overview of the value chain actors involved in PGS certified Nendran banana and the constraints faced by the farmers in this value chain.

### Literature Review

#### Studies on Value Chain

Porter (1985) [22] explained value chain as a series of activities where products flow through all of the chain's operations in turn, and each activity adds value to the product. The products have higher added value as a result of the chain activities than the total of the added values of all activities.

According to Hobbs (2001), value chain is a vertical alliance or strategic network connecting a number of independent commercial organizations inside a supply chain.

McPhee (2006) defined value chain as the various value-added stages from material procurement to distribution, sale, and service of the final product, as well as the value-added stages from raw material to end-user as a product is manufactured and distributed, with each stage representing an

industry.

According to Hellin and Miejer (2006), value chain referred to the overall series of actions required to bring a product or service from creation to delivery to end customers, and also disposal after usage.

Weirich (2007) defined value chain as a larger term that encompassed analysis at every stage of the process, from raw material handling through end-user service, with the goal of giving the most value at the lowest cost.

According to Vermeulen (2008), the sequence of operations required to manufacture a product or supply a service is referred to as the value chain. Input providers, producers, traders (wholesaler and retailer), processors, and consumers were all represented.

### Study on Value Chain of Banana

Tukan *et al.* (2006) in West Java, Indonesia, investigated approaches to improve banana growers' market links. He discovered that fruits were sold in four different ways:

Channel 1: Farmer to local market or final consumer

Channel 2: Farmer to local collector to local trader to local consumer or market

Channel 3: Farmer to local collector to regional trader or retailer to urban customer

Channel 4: Farmer to local collector to local trader to regional trader to regional retailer to urban customer

Pradhan *et al.* (2012) analyzed the value chain with the objective of finding the variable gap in value additions in the Indian banana industry. For this study, ownership status, holding size, family labour, expenditure, and family income were used as variables. With the cooperation of banana farmers, data was collected from channel distributors in the value addition process. Per centage and path analysis were used to examine the collected data. The findings revealed that age had a significant impact, with family income and holding size having the greatest indirect effect in describing the subsequent variable gaps in value addition.

Rinchui 2013 in a study titled "Value Chain Analysis of Banana in Vellangalloor Block, Thrissur District," attempted to map the value chain of the Nendran banana as well as evaluate the main actors engaged. Despite the fact that there were many value added goods that may be manufactured from Nendran banana, the study found that value added products were not being processed by processors. According to the study, the government must provide infrastructural facilities and training programs for production of value-added products in order to help farmers and improve the agricultural industry.

### Study on Participatory Guarantee Systems

Nelson *et al.* (2010) explained Participatory Guarantee System (PGS) as a part of the rising "beyond organic" movement, which focused on rebuilding local food systems and re-embedding them into their socio-ecological settings. PGS had variety of advantages for producers and consumers, but it also had number of drawbacks, such as a lack of formal recognition, social tensions, and reliance on donated resources.

According to Darnhofer *et al.* (2019), the organic sector evolved from relationships between organic stakeholders, policymakers, mainstream farmers associations, advocacy groups, and food chain actors. The temporal and spatial context influenced these relationships. The relational approach highlighted the necessity of exploiting windows of opportunity and the role of creativity in actions by framing the organic system as an ensemble of social relations rather than a



field of invariant logic.

Giovanni *et al.* (2021) in his study titled “A Participatory Analysis of the Control and Certification System in the Italian Organic Rice Value Chain” proposed ways to improve the control and certification systems in organic rice cultivation in Italy. The study found solutions to mitigate the weakness of their certification systems by standardizing the procedure which is important to enhance the reliability in the organic sector. Another aspect to be improved in the value chain was the training of operators and technicians who were involved in the Organic rice production.

### Methodology

The present study was based on mainly two districts of Kerala, Trivandrum and Thrissur. Farmers who were certified under Participatory Guarantee Systems were identified from the PGS-India online portal and were contacted for data collection. From each district, thirty farmers, fifteen intermediaries and thirty consumers dealing with Nendran were contacted. Convenience sampling method was used for the data collection from 150 stakeholders involved in the value chain of PGS certified banana.

Individual farmer surveys, observation, focus group discussions, and key informant interviews with chain players were adopted for collection of primary data using semi-structured questions and checklists. Descriptive and econometric approaches were used to analyze the collected data. Approaches such as per centage and mean, value chain mapping, marketing margin and Garrett ranking method were used for analysing the data.

### Results and Discussion

#### Demographic Characteristics of the Farmers

The descriptive statistics (Table 2) gives the demographic characteristics of the sample farmers. Among the 60 farmers who had participated in this study, 61.70 per cent were male and 38.3 per cent were female. While comparing the age between farmers, majority were in between the age of 41-60 with a cumulative per centage of 81.70. Only 13.30 per cent and 5.00 per cent of farmers were aged in between 61-70 years and 31-40 years respectively. About 98.30 per cent of the sample farmers were married while 1.70 per cent were unmarried.

**Table 2:** Demographic variable of Farmers (n = 60)

Characteristics		Per centage	Frequency
Gender	Male	61.70	37
	Female	38.30	23
Age (Years)	31-40	5.00	3
	41-50	41.70	25
	51-60	40.00	24
	61-70	13.30	8
Marital Status	Married	98.30	59
	Unmarried	1.70	1
Education	Illiterate	6.70	4
	Primary	18.30	11
	Secondary	45.00	27
	Higher Secondary	23.30	14
	Graduate	6.70	4
Annual Income	<100000	38.30	23
	100000-200000	51.70	31
	200000-400000	10.00	6

About 45 per cent of farmers were educated till secondary school (10<sup>th</sup> standard) followed by higher secondary (12<sup>th</sup> standard) 23.30 per cent and 18.30 per cent of the farmers completed primary education (till 5<sup>th</sup> standard) and 6.70 per cent of farmers did not receive formal education as they have started farming at a very young age. Meanwhile 6.70 per cent of farmers were college graduates. Nearly 52 per cent of farmers earned between Rs. 1,00,000 – Rs.2,00,000 annually followed by 38.30 per cent earned within Rs. 1,00,000. Only 10 per cent of farmers earned in between Rs. 2,00,000 to Rs. 4,00,000.

#### Farm characteristics of Producers

About half of the respondents had 5-10 years of experience in farming, followed by 26.70 per cent of farmers had 10-15 years. About 15 per cent of the farmers had less than 5 years' experience and only 8.30 per cent of the respondents were seasoned farmers with 15-20 years of farming experience. But in case of experience in banana farming, 55 per cent of farmers had 5-10 years of experience followed by 28.30 per cent farmers had less than 5 years' experience. Nearly 12 per cent farmers had 10-15 years of banana farming experience whereas only 5 per cent were seasoned banana growing farmers with 15-20 years' experience.

**Table 3:** Farm characteristics of Producers

Characteristics		Per centage	Frequency
Farming Experience (years)	1-5	15.00	9
	5-10	50.00	30
	10-15	26.70	16
	15-20	8.30	5
Farm Size (hectares)	<1	50.00	30
	1-2	33.30	20
	2-4	16.70	10
Cultivated Area Banana (hectares)	<1	73.30	44
	1-2	25.00	15
	2-4	1.70	1
Experience in Banana Cultivation (Years)	1-5	28.30	17
	5-10	55.00	33
	10-15	11.70	7
	15-20	5.00	3
PGS Certificate Type	PGS Green	91.70	55
	PGS Organic	8.30	5
Regional Council Attached	VFPCCK	40.00	24
	MSSS	25.00	15
	PAO, Tvm	8.30	5
	PAO, Tcr	10.00	6
	Thanal	16.70	10

Farm size was another distinguishable characteristic of Nendran farmers in this study. Compared to other South Indian states, farmers in Kerala are small and marginal types with very few exceptions. Majority of the sample farmers (50 per cent) owned less than 1 hectare of land. This was followed by 33.30 per cent of the farmers having 1-2 hectares of land which was mostly under subdivision. However, 1.70 per cent of the farmers had 2-4 hectares of land which was both owned and leased by them. About 73.3 per cent of sample farmers cultivated Nendran banana under 1 hectare, followed by 25 per cent cultivated in between 1-2 hectares and only 1.70 per cent farmers had 2 to 4 hectares of banana cultivation.

The PGS certification type for majority of sample nendran banana farmers was PGS- Green which accounted for 91.70 per cent which meant that they have been practicing organic cultivation method for less than 2 years and under the conversion period. Only 8.30 per cent farmers had PGS-Organic certification meaning that they had completed more than 2 years of organic cultivation.

During the study, it was found that the majority of the respondents were affiliated with one of the five regional councils. On a national level, regional councils are responsible for many supporting functions such as registration, training, and certification, as well as facilitating mutual recognition for various local groups by auditing the

organic guarantee of certified farms, which helps to build credibility in the system.

About 40 per cent of the respondents were associated with the Vegetable and Fruit Promotion Council, Keralam, which is a public sector undertaking (PSU) under the Government of Kerala. This was followed by Mannacard Social Service Society which accounted for 25% of the respondents.

Agricultural Department, Government of Kerala had appointed Principal Agricultural Offices (PAO) in each district, empowered to issue PGS certification. 8.30 per cent and 10.00 per cent of farmers were affiliated with PAO Trivandrum and Thrissur respectively. Nearly 17 per cent of farmers were affiliated under Thanal, which is an NGO based in Trivandrum overseeing the PGS certification process.

### Mapping of PGS Certified Nendran Banana Value Chain

The first step of a value chain analysis is the mapping of the flow of product from its seed stage to the final stage (Fasse, 2009) [10] that illustrated the identified chain actors and their functions, as well as their financial and information flows. The mapping includes identifying the actors and tracing the product flows along the chain, beginning with input supply. The major stakeholders involved in the process of value chain are given in the figure 4.1.



Fig 2: Core processes and stakeholders involved in the Nendran Banana Value Chain

### Nendran Banana Value Chain Actors

The major value chain actors identified for PGS certified Nendran Banana were input suppliers, farmers (producers), collection agents, Self-Help Group of farmers locally known as Swasraya Karshaka Samithies (SKS), wholesalers, retailers, eco-shops, and consumers.

#### Input Suppliers

The basic inputs for cultivation of Banana were suckers, organic manures, organic manures and biofertilizers, technology, machineries, and credit. Among the thirty farmers who have been interviewed from two districts, only seven farmers had purchased suckers from different suppliers. The supplier was the district agricultural office nursery (Krishi bhavans). Other farmers saved suckers from the previous harvest. The purchase cost of suckers from Krishi bhavan was Rs. 15 per plant whereas from farmers it ranged from Rs. 10 – Rs. 12. Organic manures and biofertilizers were procured from nearby livestock farms, agricultural university, and agricultural office. Some of the farmers have also availed credit using Kisan Credit Cards where they were able to take up to 3 lakhs for 3% interest rate.

#### Producers

Farmers / producers are the main actors in this Nendran Banana value chain as they were the primary link who cultivated and supplied the product in the market. Majority of farmers used the suckers taken from older plants or from other farmers in the same PGS groups. The planting season was between September to October coinciding for harvest when Onam festival arrived. One of the major channels through which the farmers sold their products was through SKS

market or locally known as ‘Vipani’ where they assembled once a week at a regular place and conducted price bidding. Consumers, Wholesalers and Collection agents participate in ‘Vipani’. Some of the farmers directly sold from the farm gates.

#### Local Collection Agents

Another stakeholder found in this value chain are the collection agents based in rural areas where many small and marginal farmers were present with their products, but unable to sell them in cities and big market. These agents are either a representative farmer from the PGS group or a trader. In Nanniyod panchayat of Trivandrum district, the farmers conducted weekly street market in cities, where the representative farmer procured all the vegetable and fruits from other farmers and sold them in these street markets. By this method the farmers saved money spent in transportation and time savings that resulted in higher returns. Consumers who purchased from these markets developed trust on the farmers and the products. Similarly in Thrissur district, there was a weekly market run by the farmers themselves where consumers directly purchased from the PGS farmers, and this was successful mainly because of the trust they have on these farmers.

#### Wholesalers

Wholesalers are apparently less in number in the current value chain as PGS farmers had better marketing opportunity and returns through other channels. Yet, there were some farmers who sold to the wholesalers at the current market rates, as they had bulk quantity for sales. Since banana is highly perishable in nature, the farmers were faced with storage, pest

attacks and perishability issues. In addition to that, these wholesalers had network across the state with transportation facilities, which made the movement of banana and other products much easier compared to what an individual farmer can do.

**Retailers**

These are stakeholders who had direct link between the farmers and final consumers. They included local vegetable/fruits shops, eco-shops, and established retail chains like Thanal organic bazar, Santhigiri shops, and many more. Most of the consumers preferred to shop from these eco-shops as they had built a relationship with the retailers.

**Consumers**

The final stakeholders are the consumers who purchased the Nendran from any of the above value chain actors. PGS-India has developed an online portal such as JaivikKheti which helped the consumers and farmers to get connected. This allowed direct sales of farm products to the nearby consumers without the involvement of any other value chain actors. As a result, farmers received a fair price, and the consumers were able to purchase the Nendran banana at farm-gate prices.

**Value Chain Supporters**

These are actors who provided services to the main stakeholders for the smooth functioning of the value chain. These services may be through extension services, credit services, market research information or training services which was essential for a successful value chain execution. In the case of PGS Nendran banana, the certifying agencies, and regional councils like VFPCCK, Thanal, Mannarkad Social Service Society (MSSS), Principal Agricultural offices of the respective districts played an important role as the value chain supporter. Institutions like the Kerala Agricultural University, Agricultural offices, Extension training centers, Krishi Vigyan Kendras (KVKs) also plays an important role in disseminating the information related to production and marketing of products.

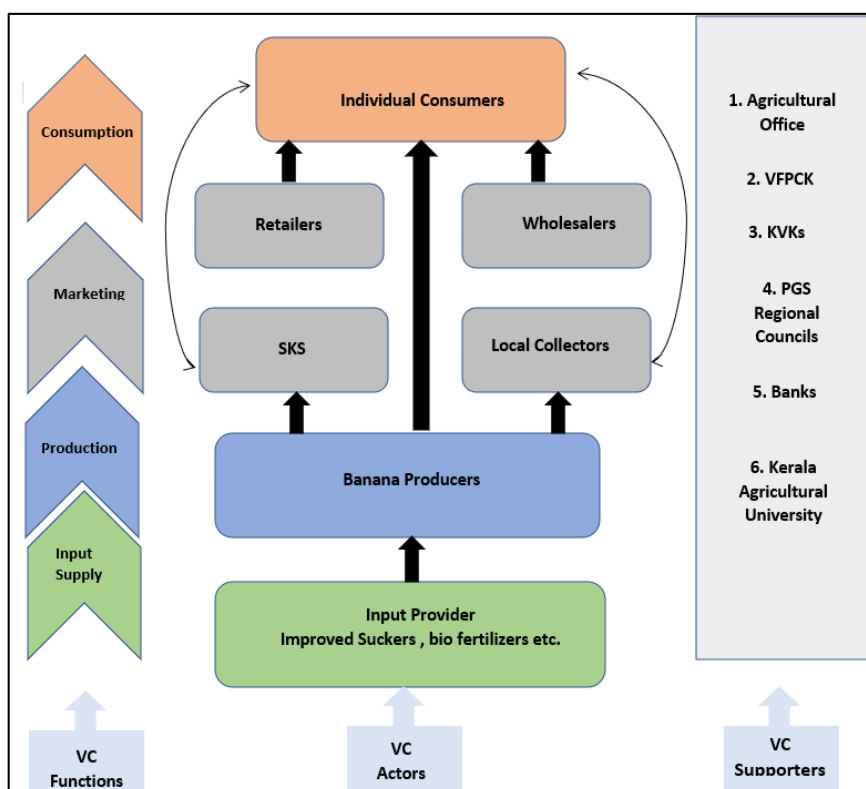
**PGS Certified Banana Value Chains**

The study has identified five primary Nendran banana value chains starting from the production side to its consumption. The quantity of Nendran banana sold in August 2021 was considered as the channel with highest sales volume. A total of twenty farmers from Trivandrum and Thrissur districts were selected. The total volume traded by the farmers was 1150 kg which was sold among the different value chain actors such as consumers, wholesalers, SKSs, local collection agents, or retailers depending on their convenience and prices.

**The five chains identified during the survey were**

- Chain 1:** Producer => Consumer = 195kgs (16.95%)
- Chain 2:** Producer => Wholesaler => Retailer => Consumer = 65kg (5.65%)
- Chain 3:** Producer => Collection Agents => Consumer = 265kg (22.17%)
- Chain 4:** Producer => Retailer/Eco-shops => Consumer = 255kg (23.04%)
- Chain 5:** Producer => SKS => Consumer = 370kg (32.17%)

Accordingly, it was evident that maximum volume of PGS certified Nendran banana passed through Channel 5 involving farmer’s Self Help Group (SHG) locally known as Swasraya Karshaka Samithies (SKS) which was about 370 kg in August 2021 accounting for 32.17% of sales. This was mainly because of the easy accessibility for the farmers and an efficient administration run by the members of the farmer group. This was followed by channel 3 and 4 which accounted for 22.17% and 23.04% of total volume traded in the banana value chain. Retailers like Santhigiri, Thanal organic bazars, and Eco-shops had high demand for fruits and vegetables on a daily basis. However, it is also important for them to collect organic banana from trusted sources. Therefore, this channel ensured faster movements of products from farmers to consumers.



**Fig 2: PGS Certified Nendran Banana Value Chain Map**

Channel 1 involved sales of Nendran banana directly to the consumers at the farm gate, which accounted for only 16.95% of total sales volume. Some consumers had direct contact with the farmers which resulted in the sales of banana from the farm itself. There are no involvement from other value chain actors in this transaction as a result, the farmers were ensured with remunerative price and consumers purchased it at reasonable price compared to market rate. Finally, the least quantity of banana was traded in this value chain 2 involving wholesalers, which accounted for only 5.65% of total sales volume. This was mainly because most of the farmers have an established marketing practices with other value chain actors for a better price and convenience. Moreover, the wholesale deals resulted in payment delays that was not preferred by the farmers.

### Constraints faced by PGS Farmers Cultivating Nendran Banana in Kerala

From individual interviews, constraints faced by the PGS farmers were identified and prioritized using Garrett ranking method. Seven major constraints were identified during the study and farmers had ranked these seven constraints based on their experience.

**Table 4:** Constraints faced by PGS Farmers

Constraints	Mean Score	Rank
Lack of Governmental Support	28.14	7
Involvement of Local politics	29.6	6
Lack of market for PGS organic products	54.42	4
Reduced Yield	60.96	2
Lack of support for livestock under the scheme	49.25	5
Poor awareness of consumers about PGS certification	69.91	1
Lack of market linkages	55.46	3

According to the PGS farmers, consumers are not aware about the PGS certified products but have awareness about other third party certifications (TPC). As a result, farmers were unable to get premium prices for their products. Even though eco-shops provided a platform for the sales of PGS certified products, the returns was less compared to the Third Party Certified products.

The second major constraint faced by the farmers was the low yield. Compared to conventionally produced Nendran banana which yielded about 20 kgs per plant, majority of farmers achieved an average yield in between 12 - 15kg per plant. The main reason for low yield was because of the use of natural and organic fertilizers which had lesser plant nutrients compared to chemical fertilizers and PGRs. Major pests like weevils, stem borers also contributed to lower yields as farmers were unable to apply chemical pesticides due to strict regulations.

Lack of market linkage was another constraint faced by the farmers. There is a gap in linking input dealers, producers, and other stakeholders in the value chains. Poor organization, unequal market access, and a lack of protection measures to protect these small scale farmers led to small scale banana farmers in the rural parts reduced returns.

Lack of market for PGS products was the fourth constraint faced by the farmers. This was coupled with the lack of awareness regarding PGS certification among the general public. Despite the fact that the government and PSUs have taken numerous steps to promote organic farming, Kerala's markets are stocked with fruits and vegetables supplied from

other states that contained higher levels of chemical residue and are sold at lower prices. Due to the lack of assurance from TPC, consumers were not assured of authenticity of PGS products leading to a lack of market for PGS products in Kerala.

Lack of support for livestock under the scheme was the fifth constraint faced by the farmers. Currently, there are no schemes or subsidies for the PGS certified farmers. Livestock is a necessary component for most of the organic farms but maintaining livestock comes with costs. Most of the marginal farmers were unable to bear this cost without getting support from the Government. As farmers and farmers groups are only involved in the PGS certification process with very little interventions from the regional councils, there was less involvement of politics among the PGS farmers. This was mainly because of the trust within the group and clear communication among the members. Government of Kerala and the Department of Agriculture along with the central ministry schemes have helped the farmers to register under PGS certification systems. But in terms of funding there haven't been any special consideration for the PGS farmers which was the reason why lack of governmental support ranked seventh by the farmers.

### Conclusion

This paper discussed about the value chain flow of Nendran banana which was certified under the participatory guarantee systems. The following conclusions are made from the study.

The sample farmers who participated in this study were mainly the small and marginal farmers with an average experience of 10-15 years. Not only Nendran banana, but these farmers also had experience in producing different vegetable crops, plantation crops, and livestock for maintaining their farms. Yet, the annual income was lower, when compared with farmers from other states. The main reason being higher cost of production and labor charges.

The value chain analysis of PGS certified Nendran found five value chain functions, six stakeholders and six value chain enablers. The functions were Input Supply, Production, Marketing and Consumption. The main actors in this value chain were the Input suppliers, who provided banana suckers, biofertilizers, manures etc., Farmer/ Producers who were responsible for the cultivation, local collection agents, wholesalers, retailers/ eco-shops and finally the consumers.

This study identified five chains through which Nendran banana passed through and found that the maximum volume was through the channel where Swasraya Karshaka Samithies (SKS) are involved, and the least was though the channel where wholesalers were involved. This was followed by the channels consisting of collection agents and retailers/eco-shops.

Finally, Participatory Guarantee Systems for organic certification is still under development stage in Kerala due to lack of marketing opportunities available for the farmers and poor awareness among the consumers. Developing a proper value chain system will ensure the smooth flow of products from farmers to consumers that will ensure maximum returns for the farmers and reasonable price for the consumers.

### References

- [https://apeda.gov.in/apedawebsite/organic/data.htm#Category\\_wise\\_Production\\_of\\_Organic\\_comodities\\_2020-21](https://apeda.gov.in/apedawebsite/organic/data.htm#Category_wise_Production_of_Organic_comodities_2020-21)
- APEDA 2021. APEDA. Retrieved from <https://apeda.gov.in/apedawebsite/organic/data.htm#Sum>



- mary\_Statistics\_2021
3. Archana. Role of Indian Government in the Development of Organic. *Journal of Agriculture and Veterinary Science* 2013, 32-39.
  4. Bhardwaj M. Growth and performance of organic farming in India: what could be the future prospects? *Journal of Current Science* 2019, 1-8.
  5. Chandra. Present status and scenario of Participatory Guarantee System-India. International expo mart and centre, 2017, 107-117.
  6. Cuddeford. An introduction to agricultural value chains. *SPORE* 2012.
  7. Dangour A. Nutritional composition & health benefits of organic foods-using systematic reviews to question the available evidence. *Indian Journal of Medical Research* 2010, 478-480.
  8. Department of Economics and Statistics. Retrieved from Government of Kerala 2020. <http://www.ecostat.kerala.gov.in/index.php/agriculture>
  9. Fabiansson S. Safety of Organic Foods. *Encyclopedia of Food Safety*, 2014 417-422.
  10. Fasse. Value chain analysis methodologies in the context of environment and trade research, *Diskussionsbeitrag*. 2009.
  11. IFOAM. 2008. Retrieved from <https://www.ifoam.bio/our-work/how/standards-certification/participatory-guarantee-systems>
  12. IFOAM and FiBL. The World of Organic Agriculture 2020.
  13. Indian Brand Equity Foundation. 2021. Retrieved from <https://www.ibef.org/industry/agriculture-presentation>
  14. Archana K. Role of Indian Government in the Development of Organic. *Journal of Agriculture and Veterinary Science* 2013, 32-39.
  15. Chandra K. (n.d.). Present status and scenario of PGS. International expo mart and centre 2017.
  16. Kumar. Agricultural Value Chains in India: Prospects and Challenges. CUTS International 2016.
  17. Kumar. VALUE CHAIN: A CONCEPTUAL FRAMEWORK. *International Journal of Engineering and Management Sciences* 2016, 74-77.
  18. Organic Trade Association. Organic hotspots. 2020. Retrieved from Organic Trade Association: <https://ota.com/resources/market-analysis>
  19. PGS India 2021. Retrieved from <https://pgsindia-ncof.gov.in/home.aspx>
  20. PGSIndia 2021. [pgsindia-ncof.gov.in](https://pgsindia-ncof.gov.in). Retrieved from [https://pgsindia-ncof.gov.in/pgs\\_india.aspx](https://pgsindia-ncof.gov.in/pgs_india.aspx)
  21. PIB. (2021, April 27). *Press Information Bureau*. Retrieved from <https://www.pib.gov.in/PressReleasePage.aspx?PRID=1714281>
  22. Porter M. *The Competitive Advantage: Creating and Sustaining Superior Performance*. NY: Free Press. 1985.
  23. Research and Markets. TechSci Research 2021. doi:5338134
  24. TPCI. Trade Promotion Council of India 2019. Retrieved from <https://www.tpci.in/indiabusinesstrade/blogs/organic-food-certification/>
  25. Trade Promotion Council of India. (n.d.). Retrieved from <https://www.tpci.in/indiabusinesstrade/blogs/organic-food-certification/>
  26. Cuddeford V. (n.d.). An introduction to agricultural value chains. *SPORE*.
  27. Yadhav. Towards a healthier nation: organic farming and government policies in India. *International Journal of Advance Research and Development* 2017, 153-159.
  28. Zander K. Consumer preferences for additional ethical attributes of organic food. *Food Quality and Preferences*, 2010, 495-501.