

## **A study on Supply Chain Management of Organic Vegetables and Fruits in Bangalore City**

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### **Abstract**

SCM is done with an intention of effective and efficient utilization of materials, information and capital. Proper supply chain management of vegetables and fruits ensures that consumers get the right quantity and quality of vegetables and fruits at the right time and for affordable price. Major problem of supply chain management in India is having a number of intermediaries, quality degradation, poor infrastructure facilities and high cost of operation because of the high level of wastage. Selling organic vegetables and fruits is even more challenging as the differentiating between organic and conventional vegetables and fruits is not easy and usually organic food products are sold at a premium price. Effective supply chain management of organic vegetables and fruits can make selling of them profitable for the vendors and farmers. SCM activities for organic vegetables & fruits and its functioning in Bangalore city was analysed in this paper. Transportation and logistics management cost are borne by the farmers and organic farmers association is playing a crucial role in Bangalore city by acting as an intermediary between farmers and vendors for supplying certified organic food products. Certified organic vegetables and fruits sellers are facing competition from conventional vegetables and fruits suppliers and uncertified organic vegetables and fruits suppliers. The existence of uncertified organic vegetables and fruits market is not a good for certified organic vegetable and fruit market and the Government needs to take steps in this connection. Existing supply chain management for organic vegetables and fruits in Bangalore city is effective.

Key words : Supply chain management, organic vegetables & fruits, logistics, transportation

### **1.1 Introduction**

Supply chain management (SCM) involves several activities such as planning, executing and controlling of product flows. SCM activities start from acquiring of raw material from suppliers to distribution of finished goods to the final consumers. In case of manufacturing units material moments in the production process are also the part of supply chain management (SCM). SCM is done with an intention of effective and efficient utilization of materials, information and capital. SCM function through proper inventory management, production management and transportation or logistics management. Logistics management is component of supply chain management and it includes activities such as packaging, transportation, warehousing, distribution and delivery. SCM includes broad based activities such as strategic sourcing of raw materials,

procuring goods and materials at the best prices and coordinating all the activities across the supply chain network of the channel partners including logistic management (Rais & Sheoran, 2015).

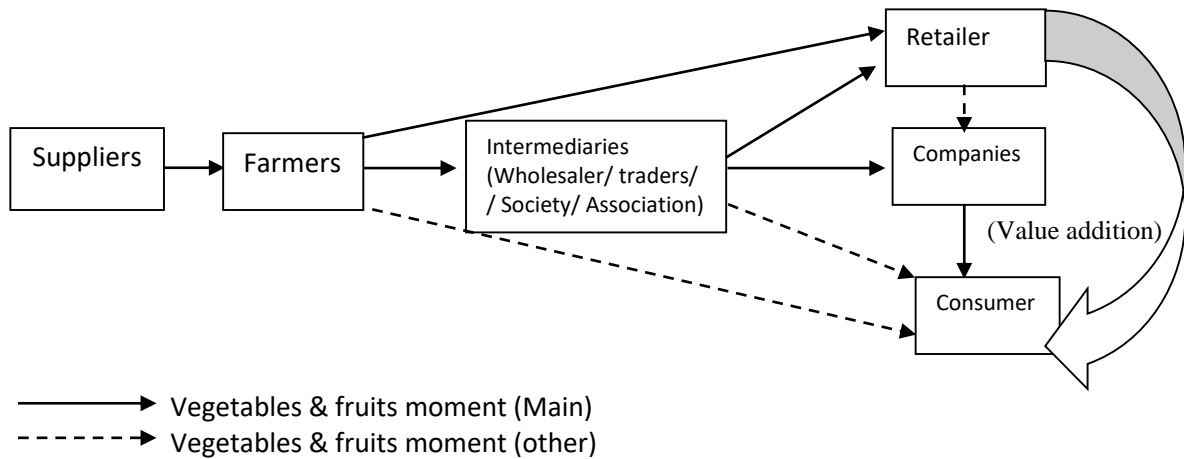
### **1.1.1 Supply Chain Management of Vegetables and fruits in India**

Proper supply chain management of vegetables and fruits ensures that consumers get the right quantity and quality of vegetables and fruits at the right time and for affordable price. Effective functioning of supply chain management helps the farmers and vendors to get a good return on their investment without worrying about the wastages, damages, not getting the right price, warehouse related issues, etc. Major problem of supply chain management in India is having a number of intermediaries, quality degradation, poor infrastructure facilities and high cost of operation because of the high level of wastage (Veena & Venkatesha, 2011). With the help of proper supply chain management farmers can cut down their cost and improve the quality and maintenance of vegetables and fruits.

It is estimated that approximately 60 percent of food quality is lost in the supply chain from farm to the final consumers in India. Current supply network of vegetables and fruits in India has made consumer pay nearly 35 percent more than what they could. Farmers in India are getting around 30 percent of what consumers pay at the retail store and it is very low compared to what the farmer in USA (around 70 percent) are receiving. Main reason for this is wastage level in USA is as low as 4 to 6 percent (Bhardwaj & Palaparthi, 2008).

Food product supply chain management related challenges are faced by even developed countries like USA, England and Germany; even though in these countries organized retail is highly developed. Retailing in India is highly dominated by unorganized players and it is fragmented. There is a huge inefficiency in the supply chain of vegetables & fruits in India. Main reasons for this are number of intermediaries, poor infrastructure, not having proper information flow between the stakeholder and packaging & handling related issues.

In India there are several intermediaries operating in the process of supplying vegetables and fruits from farmers to consumers. In vegetables and fruits supply chain, there is no value addition happening from the intermediaries. Time, place and possession utilities are offered by the intermediaries in selling of vegetables and fruits. Vegetables and fruits reach from farmer to consumer through intermediaries without any major changes in them. Unlike the packaged food products, in vegetables and fruits supply chain management there is no role of a food processing company. Food processing companies need vegetables and fruits for the preparation of ready to eat products, fruit jam, jelly, fruit juice, etc. In order to meet the requirement of food processing companies' intermediaries are acting as a link between farmers and food processing companies. Vegetables and fruits supply chain is much smaller than packaged food products supply chain. By reducing the number of intermediaries between farmers and consumers, selling price of vegetables and fruits in the market can be reduced. Reducing the number of intermediaries might not affect the supply chain of vegetables and fruits as they are not adding any form utility.



**Figure - 1: Supply chain of vegetables and fruits**

Supply chain management (SCM) of vegetables and fruits comes under the category of unpackaged food product SCM. Packaged food product supply chain management can be studied from the perspective of the companies as the Companies can anchor operations of packaged food product supply chain management with their resources and control over all operations of channel partners. Companies can give value addition to the food products for packaged food products; therefore they dominate the supply chain of packaged food products. Whereas, supply chain management of vegetables and fruits need to be studied from the perspective of the farmers, vendors and intermediaries. Neither of these parties have any control over the operations of supply chain management of vegetables and fruits.

As shown in the Figure-01, farmers can supply vegetables and fruits directly to the consumers, retailers, wholesalers and associations. Consumers use vegetables and fruits for the self-consumption and other intermediaries' buys vegetables and fruits for further sales. These intermediaries can sell vegetables and fruits to companies and consumers. Some of the food product supply chain management initiatives such as E-choupal, reliance fresh supply chain, Namdhari, Saffal etc., are successful initiatives by the companies to procure food products directly from the farmers. In case of perishable goods such as vegetables and fruits, companies buy from intermediary/traders as they can meet their bulk buying requirements in time. Major players involved in organic vegetables and fruits supply chain are farmers, society or association, middleman, retailers and consumers. As none of the intermediaries, farmers and retailers have any control in vegetables and fruits supply chain, an attempt is made to explain supply chain management from the perspective of farmers and vendors.

### 1.1.2 Organic food products and Conventional food products

Food products that are grown by organic agriculture practices are called as organic food products. Organic agriculture practices do not use chemical fertilizers, growth regulators, pesticides, additives and genetically modified organism (GMOs). Organic farm practices

are regulated and these regulations vary from country to country (Burns, 2018). Organic food products offer several direct and indirect benefits to the consumers, farmers, ecology and society. Organic food products are safe to consume as the risk of chemical residue is not there with them. There are high chances of organic food products having nutritional benefits as they have grown naturally and organically. Natural food means organic, but with no guarantees. Natural foods are often assumed to be food that is minimally processed and do not contain any hormones, antibiotics or artificial flavours. Rules or regulations for food products to be labelled as organic are there, but there are no such regulation for labeling food products as natural food products (Cooper A. ). Conventional food products are grown by following Conventional farm practices. Under conventional farming high yield producing seeds are used to enhance their productivity. Apart from that chemical, pesticides and fertilizers are permitted to use under conventional farming. Organic farm practices are sustainable and helpful to farmers and ecological system (Cristache, Vuță, Marin, Cioacă, & Vuță, 2018). People are willing to pay premium for organic food products; this will help the farmers and vendors to make better profits by giving quality food products to the customers. Organic farming and organic food products are beneficial to all the stakeholders. Proper pricing and regular supply of organic food products will help in the growth of organic food product market.

### **1.1.3 Supply chain management of Organic vegetables and fruits**

Organically grown vegetables and fruits are facing multiple challenges in connection with SCM because of not having proper market set up for organic food products in India. Organic food products retailing has been concentrated in urban centres of India and their presence in rural area is negligible. In this study an attempt is made to describe, whether supply chain network and supply chain management of organically grown vegetables and fruits are functioning effectively in Bangalore city of Karnataka state. In this research the farming practices, buyers of organic vegetables and fruits (OVF), transportation management, record keeping and reminding to buyers OVF, negotiation, number of major buyers, contract between the framers and buyers are covered from the farmer's perspective. Vendors' perspective of supply chain management of OVF is analysed by taking into consideration of the major suppliers of OVF, transportation management, record keeping and reminding to suppliers and customer by the vendors, negotiation, contract between suppliers and vendors etc.

In Karnataka state, organic food product retailing is highly concentrated in Bangalore city. Bangalore city has the highest number of organic food products outlets in India. In meeting vegetables and fruits requirement of all the outlets and consumers in Bangalore on a regular basis a proper supply chain management has to be there. In this study an attempt is made to know the existing supply chain management of OVF in Bangalore city and whether there is any requirement for having the alternative Supply chain management of OVF for Bangalore city is explored in the study. Farmers directly supplying of OVF to the consumer is considered as the most ideal condition for supply chain management of vegetables and fruits. Implementation of it would be most challenging tasks. The Andra Pradesh state in India has put effort in providing facilities for farmers to sell their produce directly to the consumers through Rythu Bazar (Dey,

2012). It has played a key role in addressing farmers’ issues in connection with supply chain management. Even in Andra Pradesh there is no separate market for organic food products (OFP). Other states marketing infrastructure for OVF need to be developed, which could be helpful for consumers and farmers.

Consumers prefer to buy organic vegetables and fruits from local market and supermarkets (Günden, Türkekul, Miran, Abay, & Akgüngör, 2010). Therefore, role of vendors can’t be neglected under supply chain network. Vendors provide storage, bulk buying and variety product facility to the consumers. Thus, any marketing system needs to be prepared keeping all the stakeholders into consideration.

Environment factors and health benefits are the most important factor for buying organic food product. Challenges are the structural issues such as diversity in product range, geographic spread and size operation. There are two alternative value chains available across the world for food products retailers. One is directly procuring all the food products required by the retailers from the farmers and the other one is procuring of food products from the intermediaries. Under modern retail value chain gross value received by the farmers (22.75 percent) is more than the value received under traditional value chain (19.8 percent) (Reddy, 2010). This study undertaken is intended to know the existing Supply chain network and activities in Bangalore city for OVF are traditional or modern value chain and are they functioning effectively. In this connection research was made and the details of research design are given below.

### 1.2 Research Design

Research undertaken is descriptive in nature and survey method was used to collect the necessary information by using structured questionnaires from vendors in Bangalore city and farmers who are supplying organic vegetables and fruits to Bangalore city. Simple random sampling was used to collect the information from vendors and the farmers. For the research nearly 150 respondents were approached, which includes 70 vendors and 80 farmers. In total, 61 vendors and 72 farmers have given the required information for the study.

### 1.3 Profile of Farmers and Vendors

Required information was collected from the farmers in the Bangalore Administrative division, who were selling their agriculture produce to Bangalore city and other markets.

**Table 01 - Profile of the Farmers**

General Information	Particulars	No. of respond	%	General Information	Particulars	No. of respond	%
Gender	Male	70	97.22	No. of years of farming	<5 years	9	12.5
	Female	2	2.77		6-10 years	18	25
Age	21-30	10	13.88		11 -15 years	17	23.61
	31-40	24	33.33		16 – 20years	9	12.5
	41-50	14	19.44		21-25 years	11	15.27
	51-60	13	18.05		26 -30 years	1	1.38
	>61	11	15.27		31 years >	7	9.72
Education	< 10th	2	2.77		Total	72	100

	10th Std	12	16.66	No. of years of organic farming	< 5 years	32	44.44	
	12th std	5	6.94		6-10 years	25	34.72	
	Diploma	2	2.77		11 -15 years	2	2.77	
	Degree	45	62.5		16 - 20 years	5	6.94	
	Others	6	8.33		21-25 years	5	6.94	
Average Annual Income	< 2L	6	8.33	Famer Category	26 -30 years	2	2.77	
	2L-4L	12	16.66		31 years >	1	1.38	
	4L-6L	20	27.77		Total	72	100	
	6L-8 L	11	15.27		Conventional	4	5.555	
	8L-10L	8	11.11		Par. Org.	25	34.72	
Above 10L	15	20.83	Com. Org.		27	37.5		
Land Holding	<5 acre	26	36.11		Organic Land Holding	Par. cert. org	8	11.11
	6-10 acre	28	38.88			Com.Cer.org.	4	5.55
	11 -15acre	7	9.72			Integrated	4	5.56
	16 - 20 acr	4	5.55			Total	72	100
	21-25 acre	2	2.78	< 5 acre		44	61.11	
	26 -30 acr	1	1.39	6-10 acre		13	18.06	
	31 acr>	4	5.56	11 -15 acre		8	11.11	
Frequency of organic farming	Always	44	61.11	16 - 20 acre		3	4.17	
	Often	26	36.11	21-25 acre		0	0	
	Sometimes	02	2.78	26 -30 acre		2	2.78	
	Rarely	00	0	31 & above		2	2.78	
	Never	00	0					

Source : Primary data, N = 72 respondents (farmers)

### 1.3.1 Profile of Farmers

Respondents belonging to farmers' category were profiled based on gender, age, education, annual income, agricultural land holding, organic agriculture land holding, number of years in farming and a number of years in organic farming. The majority of the respondents belonging to farmers category were male (97.22 percent) above the age of 30 years (86.18 percent) having education qualification as degree (62.5 percent).

The majority of the respondents (farmers) have stated that their annual income were above 4 lakhs (75.01 percent), land holding were less than 10 acres (74.99 percent) and they engaged in organic farming always (61.11 percent) and often (36.11 percent). The large majority of the farmers have stated that they had started doing organic farming recently and their experience of doing organic farming was less than 5 years (44.44 percent). Among the respondents, the majority of the respondents were not certified organic farmers (83.34 percent) and they were belonging to partially organic farmers (34.72 percent) and completely organic farmers (37.5 percent) (Table-01).

The profile of the farmers indicates that the farmers in the Bangalore administrative division have started organic farming recently and their organic land holding is small (less than 10 acres). They are not the certified organic farmers, but doing organic farming on a regular basis.



### 1.3.2 Profile of Vendors

Organic food product vendors in Bangalore city were approached to get necessary information about supply chain management activities undertaken by them. Vendors profiling was done on the basis of Gender, Age, Education, Category, Shop Size, Shop existence, daily income and frequency of selling organic food products. The majority of the respondents (vendors) were male (73.77 percent) above the age of 30 (77.05 percent) and graduates (80.33 percent). The large majority of the respondents have stated that they are completely organic food product sellers (72.13 percent) and they started selling organic food products (70.49 percent) in less than 6 years. All the vendors have specified that their daily income is more than Rs.4000 and a large majority of the vendors have stated that their daily income is Rs.8,000 to Rs.16,000 ( 63.9 percent).

**Table 2 : Profile of the Vendors**

General Information	Particulars	No. of respond	%	General Information	Particulars	No. of respond	%	
Gender	Male	45	73.77	Started selling organic	<2	11	18.03	
	Female	16	26.23		3-4.	18	29.50	
	Total	61	100		5-6.	14	22.95	
Age	21-30	14	22.95		7-8.	06	9.84	
	31-40	25	40.98		above 9	12	19.67	
	41-50	18	29.51		Total	61	100	
	51-60	4	6.56		Daily Income	Less than 4k	00	0
	Total	61	100			4-8 k	08	13.11
	Education	<12 <sup>th</sup>	3			4.92	8-12k	20
Degree		49	80.33			12-16k	19	31.15
PG		9	14.75	above 16k		14	22.95	
Diploma		0	0	Total	61	100		
Total		61	100	NA	07	11.48		
Category	Conv.	2	3.28	Income from V&F	<2k	03	4.92	
	P. org	15	24.59		2-4K	12	19.67	
	C. org	44	72.13		4-6k	18	29.51	
	Total	61	100		6-8k	11	18.03	
Shop Size	< 200 feet	21	34.43		>8k	10	16.39	
	200-400	25	40.98		Total	61	100	
	400-600	10	16.39		Frequency selling organic	Always	52	85.25
	More than 600	5	8.20			Often	9	14.75
Shop Exist	Less than 4 year	28	45.9			Sometimes	0	0
	5-8 year	19	31.14			Rarely	0	0
	Above 8 year	14	22.95	Never		0	0	
	Total	61	100	Total	61	100		

Source : Primary data, N = 61 respondents (vendors)

## 1.4 Discussion

Supply chain management activities for organic vegetables and fruits starts from the farmers procuring of seeds, and other required inputs from the supplier and ends with delivering the vegetables and fruits to the consumers. This research focuses on those SCM activities which start after harvesting of vegetables and fruits and ends with delivering of vegetables and fruits to the consumers. These activities can be classified as farmers' activities and vendors' activities. Farmers' activities include the basis of cultivation, Selling, transportation, record keeping and negotiation. In the same way the vendors' activities include basis of buying, procuring, transportation, record keeping and negotiation with suppliers, facilities to consumers and retailing activities.

### 1.4.1 SCM Activities : Farmers and Vendors

As mentioned earlier the supply chain management related activities are classified as farmers related activities and vendors related activities. There are some common activities, which are concerned to both farmers and vendor such as transportation, negotiation, etc. Details of these activities are given below.

#### a. Basis of cultivating and selling of OVF

Farmers are engaged in organic farming to maintain harmony with all the factors of production such as land, water, seeds, labour and ecology. The large majority of the respondents (farmers) have stated that they are doing organic farming on season based (50 percent) followed by demand based (27.7 percent) and own consumption basis (26.38 percent). Respondents were allowed to make multiple choices, and total numbers of response given by 72 respondents were 88 (122.1 percent). This shows that respondents have made one an average one choice and some of the respondents have opted more than one choice. It can be concluded from this that the majority of the farmers basis of cultivation is season based.

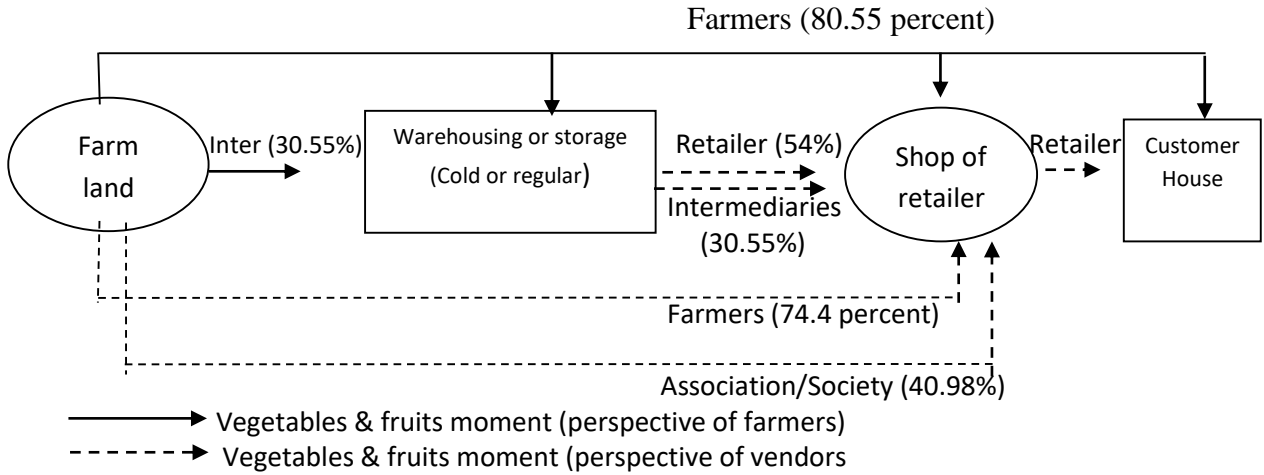
The large majority of the respondents (farmers) have mentioned that they cultivated Organic vegetables and fruits for their own consumption (66.6 percent) for their own consumption and requirements. Once the respondents meet their own requirement of vegetables and fruits they sell them. Among the respondents large majority sell OVF to local market/local shop (63.9 percent) followed by direct to consumers (37.5 percent), middleman (31.9 percent), organic shops (29.16 percent) and association/society (23.6 percent). It can be concluded that a large majority of the farmers prefer to sell their vegetables and fruits to local shops and local market.

The large majority of the respondents (vendors) stated that they sell organic vegetables and fruits on the basis of demand (65.5 percent) followed by seasons (49.1 percent). The majority of the respondents (vendors) have stated that they buy organic vegetables and fruits from farmers (67.2 percent), society or association (40.98 percent) and own farmers (40.98 percent).



**b. Transportation of OVF**

Among the respondents (farmers) the large majority (80.55 percent) have stated that they are taking the responsibility of transporting the vegetables and fruit followed by the middleman (30.55 percent). Respondents (vendors) stated that farmers (74.4 percent) take the responsibility of transportation followed by them (54.09 percent), society (40.98) and middle man (21.34 percent).



**Figure-2: Transportation and logistics**

Transportation and logistics responsibility need to be understood from the perspective of farmers and vendors. In the above figure-02, dot lines indicate the perspective of the vendors about the transportation of vegetables and fruits and the plane line indicate the perspective of a farmer about the transportation of vegetables and fruits. Farmers’ perspective of vegetables and fruits transportation is to deliver vegetables and fruit on requirement basis to intermediaries, retailers and customer. Farmers usually don’t take the responsibility of cold storage. Retailers’ perspective of transportation is procuring vegetables and fruits on requirement basis from suppliers and delivering the vegetables and fruits to consumers in the form of home delivery. Retailers also store vegetables and fruits in their shop to meet the requirement of consumers. Thus, retailers give time and storage utility to the consumers. From the figure-02, it can be stated that farmers, retailers and Society (or association) is the key parties involved in the SCM of organic vegetables and fruits in Bangalore city.

Farmers have the major responsibility of Logistic management in case of organic vegetables and fruits. From the above figure-02, it is clear that farmers are selling the organic vegetables and fruits to vendors, consumer and intermediaries. Retailers are the common link with farmers, intermediaries, and consumers. Retailer and vendors offers an assortment of organic food products to the consumers. Therefore, in the supply chain management of organic vegetables and fruits, they are considered as the main link. Retailers provide all kinds of organic food products at their outlet, which is not possible for farmers and intermediaries. In case organic retailers are put up near to the vicinity of consumers, then it will be convenient to the consumers for purchasing of organic food products on a regular basis.

**c. Reminding buyers and suppliers about OVF**

Nearly 90.74 percent of the vendors have stated that they remind their suppliers about requirement of fresh vegetables and fruits, whereas only 36.12 percent of the farmers have mentioned that they remind their organic vegetables and fruits buyers about the availability of fresh vegetables and fruits. This gives the indication that retailers are taking active participation in organic vegetables and fruits supply chain management through proper interaction with the supplier. Only 15.27 percent of the farmers have stated that they enter into a contract with the intermediary or the shopkeeper for selling organic produce. On the other hand 52.62 percent of the vendors who were selling organic vegetables and fruits, have stated that they enter one or other form of contract with the organic vegetables and fruits Suppliers.

Vendors give one or other form of services to the consumers to attract and retain them. The most important service given by the vendors are cash discount (73.7 percent) facilities, and home delivery services (83.60 percent). Therefore, we can conclude that Logistic management in connection with supplying food products at the consumer place can be taken care by the vendors.

#### **d. Record Keeping and negotiation**

Proper maintenance of buyers and sellers requirements & record by the farmers and retailers respectively, will ensure supply chain management activities goes on smoothly. Vendors need to ensure that they have multiple sources for buying vegetables and fruits to avoid out of stock situation and similarly farmers need to have more number of buyers for their produce to get a good price. Nearly 13.11 percent of vendors and 15.28 percent of farmers have stated that they don't have any major suppliers and buyers respectively. Nearly 75.41 percent of the respondents (vendors) have stated that they have 3 or more major supplier of organic vegetables and fruits and similarly 79.16 percent of the respondents (farmers) have mentioned that they 4 or less number of major buyers for organic vegetables and fruits. This shows that vendors are having multiple source of buying organic vegetables and fruits.

Nearly 40.1 percent of the farmers have stated that they keep the records of the buyers and 19.44 percent of the farmers have indicated that they maintain records of their buyers sometimes. Nearly 34.7 percent of the respondents belonging to farmers' category have stated that they rarely maintain any records associated with their food product buyers. The majority of the vendors (55.73 percent) keep the record of their suppliers always. Nearly 29.5 percent of the vendors keep record of their suppliers often and only 3.2 percent of the vendors' record about the supplier sometimes. All these indicate that proper recording is done by the vendors.

#### **e. Aspects for Negotiation**

The main aspect negotiated by the vendors at the time of buying organic vegetables and fruits from the farmers, intermediaries, and others are quality (70.8 percent), transportation (44.4 percent), Price (38.8 percent), and certification (22.2 percent).

**Table -3: Aspects for negotiation – Farmers and vendor**

Aspects of Negotiation	Farmers		Percent of Cases	Vendors		Percent of Cases
	N	Percent		N	Percent	
Quality	24	18.75	33.33	51	37.5	70.83
Price	51	39.84	70.83	28	20.59	38.89
Order processing and delivery	2	1.56	2.78	8	5.88	11.11
Certification	9	7.03	12.5	16	11.76	22.22
Transportation	41	32.03	56.94	32	23.53	44.44
None	1	0.78	1.39	0	0	0
Total	128	100	177.78	136	100	188.88

Issues negotiated by the farmers at the time of selling their organically produced vegetables and fruits are price (70.83 percent), transportation (56.9 percent), quality (33.3 percent) and certification (12.5 percent). From the above analysis it is clearly that for the farmer price is very important and for the vendor quality of organic food product is important at the time of negotiation.

#### 1.4.2 Retailing Activities in SCM

The last Link in organic vegetables and fruits supply chain is between vendors and consumers. The success of organic food product market depends upon the interaction between organic food product sellers and consumers. Majority of the time organic vegetables and fruits are sold to the customers on specific days. On these days retailers get vegetables and fruits supplies from their suppliers. Reminding of availability of fresh vegetables and fruits to the consumers by the organic food product retailers become important to ensure that fresh vegetables and fruits reaches customers as early as possible.

**Table - 4 : Keeping of fresh vegetables and fruits in a Week**

No. of Days	Frequency	Percent
Nil	7	11.48
1-2	36	59.02
3-4	8	13.11
>5	10	16.39
Total	61	100

Table -6.15 indicates that 59.0 percent of the vendors have stated that they keep fresh vegetables and fruits 1 or 2 times in a week. Some of the vendors (29.4 percent) sell organic vegetables and fruits more than three times in a week. It can be interpreted that one or two times in a week vendor sell a fresh vegetables and fruits, that day they must

communicate with their regular customers to avoid conflicts in connection with not having fresh vegetables and fruits.

The majority of the vendors (81.4 percent) remind their customer about the availability of fresh vegetables and fruits in their outlet. They communicate to the customers by sending SMS and WhatsApp messages, calling them, and personally reminding about availability on a specific day. Through the interaction with the vendors it was found that fresh organic vegetables and fruits are available in organic retail outlets in Bangalore city on Saturday, and Wednesday.

The large majority (85.2 percent) of the vendors has stated that they keep the record of their customers and nearly (91.7 percent) of vendors keep track of customer requirements. This indicates that organic food product vendors in Bangalore city are maintaining good supply chain network and doing the activity of reminding and follow-up of customer requirement effectively. Organic food product retailing operation with their customer.

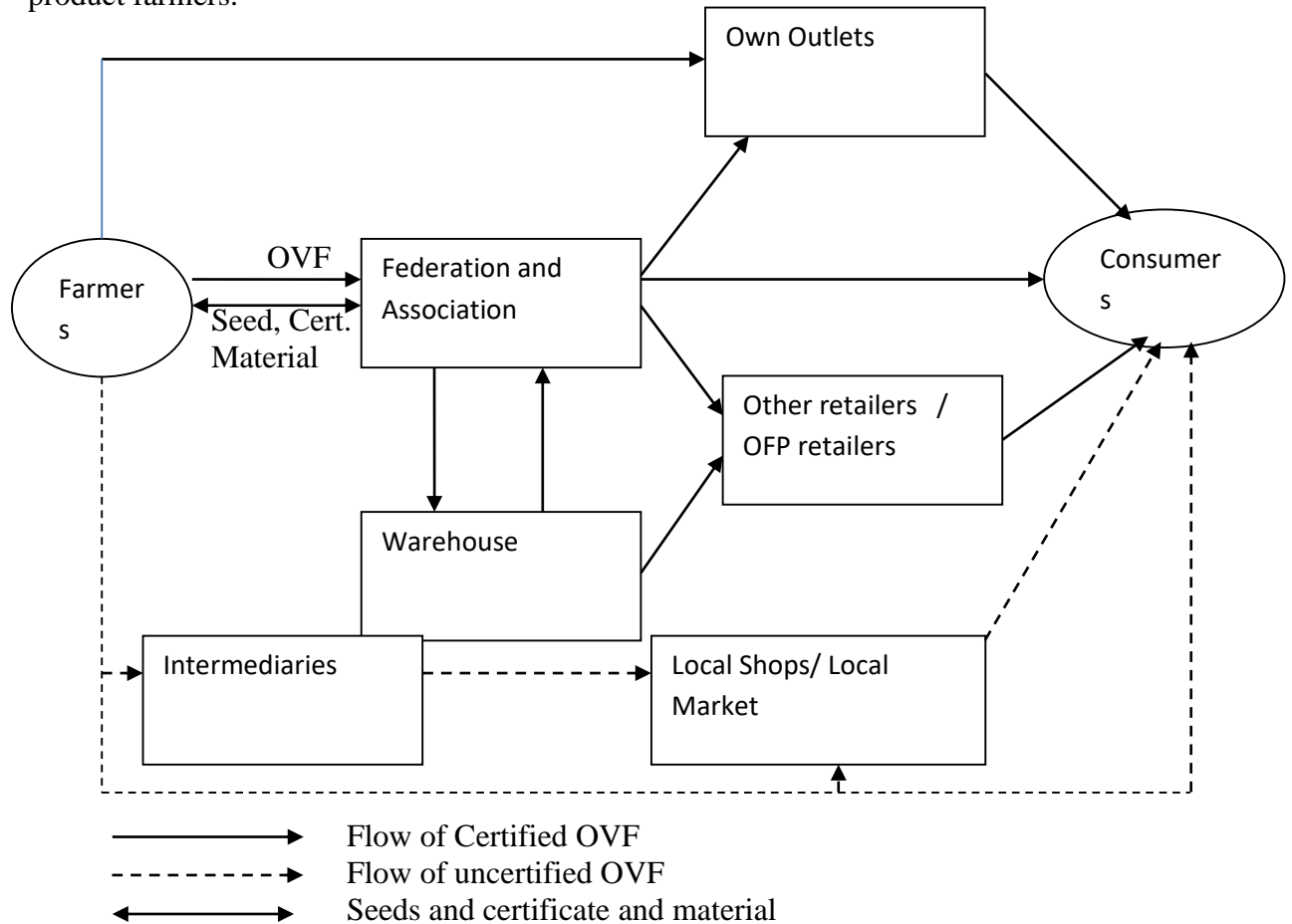
### **1.4.3 Supply Chain Management of OVF in Bangalore city**

In the Bangalore city there were more than 500 exclusive organic retail outlets existed at the time of research. Meeting the requirement of packaged and unpackaged organic food products in Bangalore city a proper supply chain management has to be there. Organic retail outlets in Bangalore city are more in number than any other individual cities in India. All the organic food processing industries have now focused on providing on time delivery of goods to the retail outlets in Bangalore city through proper supply chain management. As food processing companies don't have any role to play in case of organic vegetables and fruits supply chain management, there is a requirement for an organized player acting as an anchor to ensure the things goes in a right direction. Federation of the organic farmers Association for Bangalore Urban and rural is acting as an anchor and catalyst in effective supply chain management for organic vegetables and fruits in Bangalore city.

Organic vegetables and fruits which are getting sold in Bangalore city markets can be classified as certified organic vegetables and fruits and not certified organic vegetables and fruits. From the above figure-6.17 an attempt is made to explain how the flow of certified and not certified OVF takes place in Bangalore city. A Major portion of supply chain management for certified organic vegetables and fruits is controlled and regulated through a federation of organic farmers. The Federation provides requisite information for the farmers in terms of the method to be adopted for organic farming, certification formalities, certification assistance and group certification, seeds, manure, and other technical assistance.

Apart from this federation buys from the farmers, organic food produced at a price higher than the market prices conventionally produced food products. Federation buys organic food products exclusively from certified organic farmers. Federation encourages farmers to get involved in organic farming by buying food products of farmers even if the farmers are in the period of conversion from conventional farming to organic farming. Food products were purchased by the federation from the farmers, who were in the period of conversion from conventional farming to organic farming might not give the same price as that of organic food products, but the price given by the Federation was higher than the

market price of the conventional version of them. The federation has good storing capacity and they have their own warehouses and they take warehouse on rental basis based on the requirement. This has facilitated them to buy different quantity and variety of certified organic food products from all the minor and major certified organic food product farmers.



**Figure - 3: Supply Chain Management of OVF in Bangalore City**

Segregation and grading of organic vegetables and fruits is made by the federation after receiving the products from the farmers. Later, they supply the requisite quantity of OVF to their own outlets (Jaivika Krishika Society) and other outlets who are selling organic food products. Logistic responsibility was taken by the federation and in a week, 2 times OVF was delivered to the retailers by the federation (Association). Eventually OVF reaches to the consumers through retailers. Therefore, it can be concluded that certified organic food product supply chain management in Bangalore city is organized and professionally undertaken by the federation.

Those farmers who are not certified organic food producers, but engaged in organic ways of food production were selling their products directly to the consumer by themselves or through intermediaries and retailers. Not certified organic food product selling is bigger in volume compared to certified organic food products in Bangalore city. Not certified

organic food products were sold at the market place and local shops on a daily basis. Vendors in selling vegetables and fruits in marketplace and local shops buy the uncertified organic vegetables and fruits from the intermediaries and farmers. People were aware about uncertified organic food products market and they trust the seller and buy from them. Uncertified organic vegetables and fruit market in Bangalore city has grown because of convenience and competitive pricing.

### 1.5 Conclusions

There are challenges in connection with organic food product supply chain for the farmers. Farmers should be in a position to deliver their organically produced food products to association, federations or agencies, which can provide right price to them and take their produce on a regular basis. In case the farmers are not producing as per the requirement of the market in the guidance can be given by these institutions about the requirement by entering into contracts with them. Most of the time the transportation cost is borne by the farmers that should be substituted by the association of the farmers or the retailers who can afford to do so. Organic food product producers' associations are functioning in Karnataka. The way these associations are functioning in connection with supply chain management (SCM) of organic vegetables and fruits in Bangalore city and other cities mentioned below.

Certified organic vegetables and fruits sellers and retailers are facing competition from conventional vegetables and fruits sellers as well as uncertified organic vegetables and fruit sellers. There is a parallel market for uncertified organic vegetables and fruits in Bangalore city. The claims made by the farmers about their food products as organic, will remain under question, unless farmers were certified by the certifying agencies. In case farmers continue their claims on food products grown by them as organically and it is not certified by any certifying agency then there are no rules to stop them. Under these circumstances intermediaries and consumers buy food products as organic based on the claims made by the farmers. The uncertified organic vegetables and fruits market is bigger than the certified organic vegetable market and majority of the people have willingly accepted the claims made by the farmers and intermediaries. The existence of this market cannot be denied or curtailed by the present rules and regulations. Non certified organic vegetables and fruits market can be converted into certified organic vegetables and fruits market when consumer insists for certified organic food products and farmers willingly accept certification program.

Currently uncertified organic food product supply chain management activities are happening in Bangalore city and it continues to exist unless the new rules and regulations get formulated by the Karnataka State Government or Government of India. The existence of a market for uncertified organic vegetables and fruits is not a good sign for organic food product certification process. Therefore, the Government needs to take steps in this connection.

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