Research Article

Strengthening Agriculture Value Chain through Collectives: Comparative Case Analysis

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Abstract

Indian agriculture has always been less profitable. Several factors contribute to the low profitability in agriculture, but less value addition, weak value chain system and weak market linkage are some of the most important factors. Producer companies are helping small farmers to emerge in the market. The farmer producer organisations (FPOs) linked with the producer companies are the best example of collective actions. The collective actions for the agriculture value chain (AVC) have resulted in a decrease in the cost and an increase in revenue. FPO and producer company find a good place in the underpinning theory of collective action theory. This study examines various successful examples of strengthening AVC through cooperatives and tried to identify various factors responsible for the success of these collectives. This study has adopted a case study approach. Three successful cases, that is, Vasundhara Agriculture Horticulture Producer Company Ltd: a multi-state FPO, Abhinav Farms Club and Sahyadri Farmer Producer Company have been selected for the case study based on their successful interventions for strengthening the agriculture value chain. Primary and secondary data has been collected through telephonic interviews from the board of directors, chairman and the members of the FPO. Both primary and secondary data have been collected to compare the three cases for AVC models. The data has been analysed using a comparative case study approach. The parameters of AVC have been identified using the Delphi technique. The study has found that collective actions have helped the farmers to strengthen the agriculture value chain. The study also concluded that leadership played an important role in defining the success of the FPOs. The study brings out future directions to excel in AVC through collectives.

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Introduction

Agriculture is the major source of livelihood as the entire population is dependent upon agriculture directly or indirectly (Ali 2007). It is a source of income for the rural population (Tripathy and Kumari 2020). India has around 168 million hectares of arable land, out of which 60 million hectares are irrigated. The diversification in the production of crops in the country has made it one of the largest and second-largest producers of jute, tea, milk, cereals, pulses, fruits and vegetables (Mittal 2007). With the rise in agriculture production, it has been studied that there is a lot of wastage of agriculture commodities, especially perishable products. As per an estimate, about 30%–40% of the agricultural produce is wasted due to improper market and value chain (FAO 2019). There is a need to process agricultural commodities and focus on the agriculture value chain (AVC).

Farmer producer organisation (FPO) has resulted in linking agriculture commodities with the market. The agricultural produce is processed, and the AVC is generating revenue for the farmers (Naik et al. 2019). There is a need to promote such collectives as the FPO and farmer producer company (FPC). There is inadequate literature for the academicians and practitioners on the AVC practices of the collectives. Vasundhara Agriculture Horticulture Producer Company Ltd (VAPCOL), Sahyadri Farmer Producer Company (SFPC) and Abhinav Farm Club (AFC) are such collectives that have set an example of the sustainable AVC (Singh and Singh 2014; Soni and Trivedi 2015; Trebbin and Hassler 2012). This has led us to a research question that what are the factors which are important for strengthening AVC? Why some organisations have been able to succeed in their efforts to promote the AVC through different approaches? This study aims to explore the AVC through a case study approach and to compare the approaches towards strengthening the AVC.

The study is an attempt to document the practices of the AVC by VAPCOL, SFPC and AFC and evaluating the feasibility for other collectives. The present article is organised into eight sections. The next section elaborates on the literature on the AVC by cooperatives. This is followed by a research framework on the AVC by VAPCOL, SFPC and AFC. The next section elaborates on the results and discussions following the case study approach. The study ends with a conclusion, limitation and future research direction. In the final section, we conclude with comparative collective approaches that led to the AVC.

Literature Review

AVC is a complex web of functions including producers, processors, marketers, retailers and support service providers linked together to attain a competitive advantage. The AVC through collectives has been highly recommended by the policymakers and researchers.

Collective Action Theory

Collective action is defined as the phenomenon of having a common or shared interest among a group of people (Olson [1965] 1971). Collective action theory, formulated for social science studies, focuses on how and why individuals decide to collaborate as a group (Marrais and Earle 2017). In this context, various aspects of collective action include rewards and punishment for enhancing the member's contribution to the collectives and reduce 'free riding'. Independent approaches of individual results in short term and lower outcomes. The collective coordination and cooperation amongst the individuals can result in building joint benefits. The decision to cooperate depends upon different factors such as trust, heterogeneity in the group, potential benefits and ability to monitor and interact. Collective actions involve agency, interests, coalitions and institutions. Collective actions can be found in different forms at multiple levels to facilitate trading patterns. The collective action approach depends upon different factors such as the number of participants involved, heterogeneity of participants, face-to-face communication, linkage among the members and information about the past actions (Ostrom 2007). It is also reported in the literature that collective action empowers farmers. In a study in Peru, it was reported that collective dynamics have the power to change and those farmers who were part of collectives felt the power within (Sirdey and Lallau 2020). In a recent study (Hannachi, Coleno, and Assens 2020), the concept of agriculture collectivism was referred and the study concluded that this new agricultural collectivism has helped farmers in increasing their bargaining power and act as a nexus between various stakeholders in the supply chain. Cooperatives have also reported bridging the information gap between buyers and sellers (Hall and Matos 2010). Cooperatives have always helped farmers in increasing their bargaining power.

The perception that one's action makes a difference in the accomplishment of goals has resulted in the collective action approach. Collective action comprises of four models, namely, single-actor model, dynamic interaction among collectives' model, interdependent aggregation into collective action model and model of collective decisions of the individual (Oliver 1993). Collective action theory has undergone growth with a shift from the individual decision to collective interaction. This has also resulted in a shift from a traditional agriculture supply chain to a modern AVC. The studies have undergone opportunities in identifying different determinants of collective action (Reuben 2003). In the context of agriculture, farmer's collectives have been formed to help in increasing income avenues.

The concept of collective is very old and dates back to the 18th century. The history suggests that these collectives have evolved to support farmers in distress. The first formal step in cooperative came with the enactment of the cooperative societies act. Since then the forms of collectives have changed a lot. Based on recommendations of the committee, the Companies (Second Amendment) Bill, 2001, was finalised and introduced during December 2002 in the parliament. Finally, the Companies (Amendment) Act, 2002, came into effect on 6 February 2003. Until then, the Companies Act, 1956 (the Act), recognised only three types of companies, namely:

- Companies limited by shares (subdivided into public limited and private limited companies).
- Companies limited by guarantees.
- Unlimited companies.
- The FPC registered under Company Act is imposed on salient conditions. Ownership can be provided only to the one who is engaged in activities related to primary produce. The members should be primary producers. The producer company is termed as companies with limited liability and liability shall be limited to the amount. The name of the company shall be named as Producer Company Ltd. The producer company shall comply with specific provisions.

The most recent form is the FPC. FPC allows the farmer cooperatives to function as a corporate entity. The objective of the FPC is related to the production, harvesting, procurement, grading, handling and marketing of primary produce. Every FPC has a minimum of five board of directors and a maximum of 15 directors. The FPC provides a direct network for the marketing of food products and helps in sustaining AVC. FPC is registered under the company act 1956. It is an effective approach to sustaining the AVC through a collective approach. In a study on the impact of FPC in the Bundelkhand region, it was found that members of cooperatives have experienced a significant increase in their social capital, human capital, economic as well as political capital (Mukherjee et al. 2020).

The research framework in Figure 2 comprises one cooperative AFC and two FPC, namely VAPCOL and Sahyadri.

Agriculture Value Chain

Agriculture driven by perishable products such as fruits and vegetables has seen good production but poor utilisation (Ganguly 2011). There has been a serious concern for poor utilisation of fruits and vegetables adding to wastage (Kumari and Patil 2019). This has resulted in a shift towards the value addition of the perishable products resulting in the AVC. AVC has resulted in attaining a competitive advantage. AVC is a complex web of functions that helps in understanding complex systems (Armendàriz et al. 2015; Bammann 2007; Miller and Silva 2007). It is the process of adding value to the agriculture commodities to increase the form and place utility. There are different approaches in collectives that leads to AVC. The leadership approach, management commitment, or collective action has driven the AVC to sustainability. The AVC has imposed different strategies to achieve a competitive advantage. The collectives, cooperatives, FPCs and FPOs have resulted in achieving sustainable AVC through different approaches. Food and AVC have also supported and upgraded the policies for occupational and safety health programmes (Walters, James, and Wadsworth et al. 2017).

Gaps in Literature

Almost 50% of the 1.3 billion population of the country depends upon agriculture (Kant 2019). Indian farmers face multiple challenges such as lack of knowledge/

information, weak market linkages, high level of food wastage and scarcity of resources. The scarcity of resources in the form of infrastructure, labour, land and technology makes it difficult for an independent AVC by a firm (Okello et al. 2010). Multiple intermediaries, lack of transparency and traceability act as barriers to the AVC. To attain a competitive advantage, the AVC strategy works on efficiency and responsiveness (Chopra et al. 2013). Responsiveness refers to a variety of products, short lead times, services provided and type of innovations. For making a supply chain to be responsive, it results in the addition of cost making it less efficient. The decision framework of the value chain comprises of logistic and cross-functional drivers. Indian farming system comprises small and marginal farmers who cannot afford the huge cost to become more responsive (Foster and Rosenzweig 2011). Although AVC is a sustainable initiative towards perishable agriculture commodities yet there are various barriers to the AVC. These barriers are because the Indian farmers are mostly small and marginal. To build a sustainable AVC, there is a need to integrate the collective action theory with the agriculture system. There has been a lot of research made on the sustainable AVC and drivers of a sustainable AVC. In a developing country, there is a need to make the AVC possible with limitations. There is a research gap in the literature that can integrate the collective action theory with AVC. There is a lack of leadership and governance for better functioning and management of AVC. The cooperatives need different drivers for sustaining AVC. Infrastructure is one such driver which is required the most for the cooperatives to procure and process the perishable agriculture commodities. Many cooperatives lack technology adoption in adding value to agriculture commodities (Kumari, Jeble, and Patil 2018). Technology adoption is often driven by different barriers such as an investment, complexity of the technology, poor technical skills (Kumari and Patil 2019), poor knowledge and lack of awareness by the cooperatives. The study through a case study approach has tried to integrate the collective action by farmers.

Research Question and Research Methodology

AVC has remained a complex phenomenon for policymakers. Why some organisations have been able to succeed in their efforts to promote the AVC through different approaches, whereas others failed? To answer the research question, this study aims to explore the AVC through a case study approach and to compare the approaches towards strengthening the AVC. The proposed study was conducted during the financial year 2020–2021 in Maharashtra.

Conceptual Framework

As collectives engage in value chain activities, it is essential to understand the roles in their capacity. AVC is influenced by technology, diversified business, capacity building, infrastructure, awareness, information, pricing and transport. Figure 1 shows the conceptual framework for the study. The parameters for AVC have been identified from the literature review on UNDP, FAO, USAID, ILO and

NABARD. These parameters were confirmed for the case study through the Delphi method. The Delphi was conducted in three rounds with the help of 18 experts. Three case studies have been selected based on the criteria such as agriculture products, location, market, type of collaboration and the type of collectives (Diamond and Barham 2012). The important parameters have been further used to analyse and compare the AVC in the three collectives.

Data Collection

Primary and secondary data has been collected to meet the research objectives. Primary data was collected through questionnaires from an expert in the field of AVC and FPOs. The data collection instruments used were the Delphi method. The instruments have been combined for qualitative and quantitative data collected to address the research objectives.

Delphi Method

Delphi study was chosen for validating the parameters of AVC. The method has been developed in 1950 (Dalkey and Helmer 1963) and has been applied to several types of research (Seuring and Müller 2008). The Delphi method is used to structure communication to solve a complex problem (Turoff and Linstone 2002). For solutions, we need feedback, assessment of some groups, or individuals' views. This method results in the evaluation of the group opinion allowing for a comprehensive description (Schmidt 1997). Three iterations are often sufficient to collect the information in this methodology (Brooks 1979; Custer, Scarcella, and Stewart 1999; Cyphert and Gant 1971; Ludwig 1994, 1997). Therefore, we conducted three rounds of the Delphi technique.

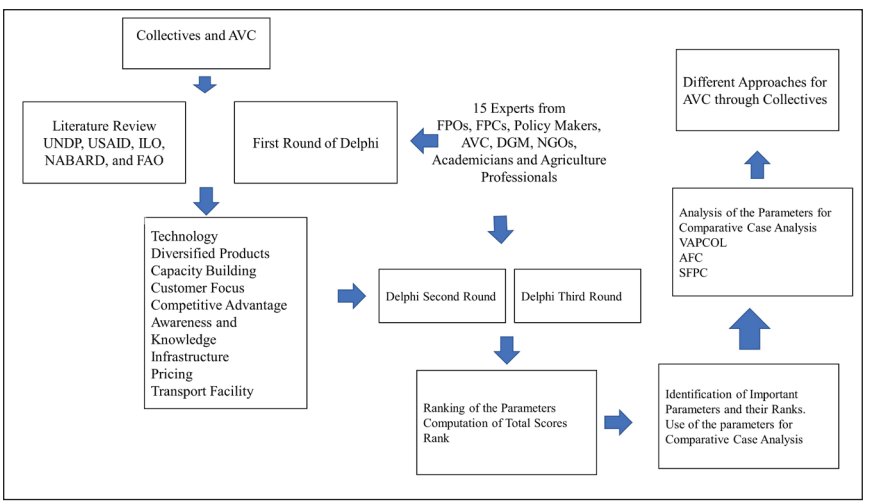

Figure 1. Conceptual Framework.

Source: Created by authors.

In the first round, we identified the parameters for AVC. An extensive literature review and experts' opinions have been taken. The index of AVC has been identified from UNDP, USAID, ILO, NABARD and FAO, the experts were asked the open-ended question as to what are the parameters for AVC? After receiving sufficient information, we formulated a well-structured questionnaire. This questionnaire was used further in the second round for data collection. In the second round, we formulated a set of questionnaires for each expert. Here they were asked to review the items and rank them. This led to identifying the areas in favour and opposition. In the third round, the experts were given the items and their ratings. They were asked to revise their judgments wherein only a slight change in the answers can be considered (Dalkey 1972; Jacobs 1997). In the fourth round, experts were given the list of remaining items, their ratings and their opinions. The number of rounds in the Delphi technique may vary from 3 to 5 (Delbecq, Van de Ven, and Gustafson 1975; Ludwig 1994). Eighteen experts were selected which included DGM, agriculture professional from government bodies, FPC, non-government organisation (NGO), policymakers and academicians.

Study Area and Sample Selection

Three cases of SFPC, AFC and VAPCOL have been taken for the study. The secondary data on the performance suggests that these three collectives are doing well in terms of promoting AVC and enhancing farmer's income. The study has addressed the process of the AVC followed and have presented a comparative view of the same.

Data Analysis

Data has been analysed based on the index such as infrastructure, input suppliers, producer/collectors, processors (adopted from UNDP Viti/Vitina Municipality 2017), information flow (Halewood and Surya 2012) and financial and supporting service (Miller and Jones 2010). The data from the Delphi method is analysed using the ranking technique.

Research Framework

The research framework focuses on producer driven model. Producer driven model focuses on aggregating, processing and selling the agricultural produce. Producer driven models focus on small-scale farmers getting technical, marketing, finance and input assistance (Miller and Jones 2010). The study identified three successful collectives following different modes of operation and tried to identify the factors of success for these organisations. All these three organisations have worked in organising the farmers in the form of collective and helped them in enhancing their income by supporting the value chain of agricultural produce (Figure 2).

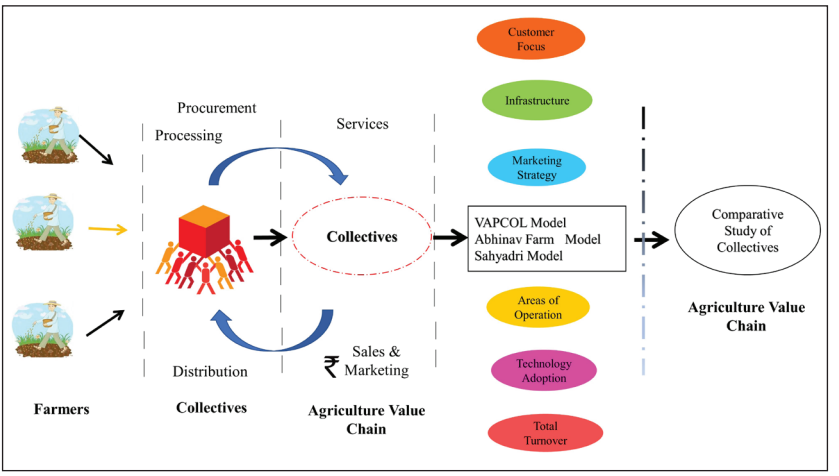

Figure 2. Research Framework.

Source: Created by authors.

Results and Findings

This section shows the results of the Delphi followed by the comparative case analysis of the collectives chosen for the study.

Parameters for AVC

To move forward with the case study analysis, the parameters for the case analysis have been identified using the Delphi method. The first round of Delphi resulted in the identification of the important parameters as shown in Table 1. Based on the total score value, the experts identified the parameters such as technology, diversified products, customer focus and infrastructure as essential elements for AVC.

Table 1. Mean, Median and Standard Deviation of the Parameters of AVC.

Parameters of AVC	Total Score	Rank	Mean	Std. Deviation	Median
Technology	148	1	2.7	1.8	2
Diversified products	88	6	6.1	3.3	5
Capacity building	78	9	6.6	2.6	7
Customer focus	124	2	4.1	2.5	4
Competitive advantage	66	10	7.3	2.2	7
Awareness and knowledge	88	6	6.1	2.3	7
Infrastructure	124	2	4.1	2.4	4
Information	92	5	5.8	3.1	7
Pricing	84	8	6.3	2.9	6
Transportation facility	98	4	5.5	3.1	1

The second round of Delphi resulted in the rankings of the important parameters. The ranking scores have been analysed to get a cumulative score. Based on the cumulative score, the parameters have been ranked as shown in Table 1. The standard deviation data reflected that the deviation in various parameters was not very high.

The important parameters identified are technology, diversified products, capacity building, customer focus and competitive advantage (Figure 3).

In the third round of Delphi, the identified parameters showed a similar pattern of the ranking system as shown in Figure 4. The parameters finalised from the Delphi study have been studied for comparing the three case studies.

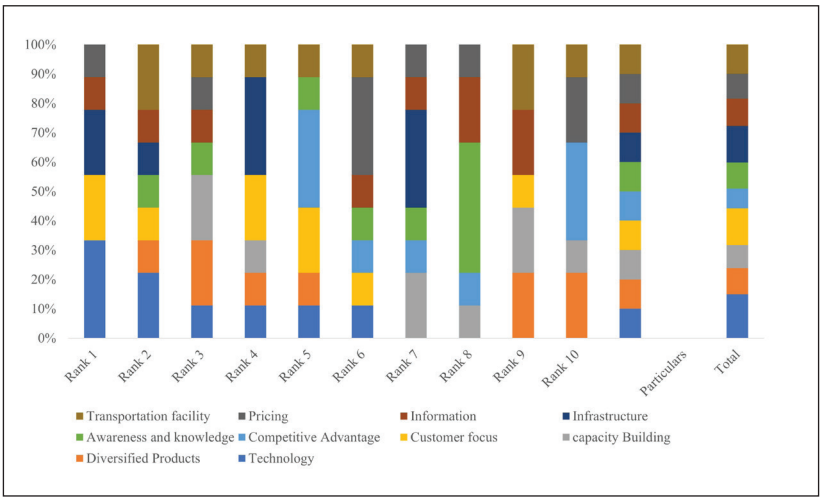

Figure 3. Delphi Results.

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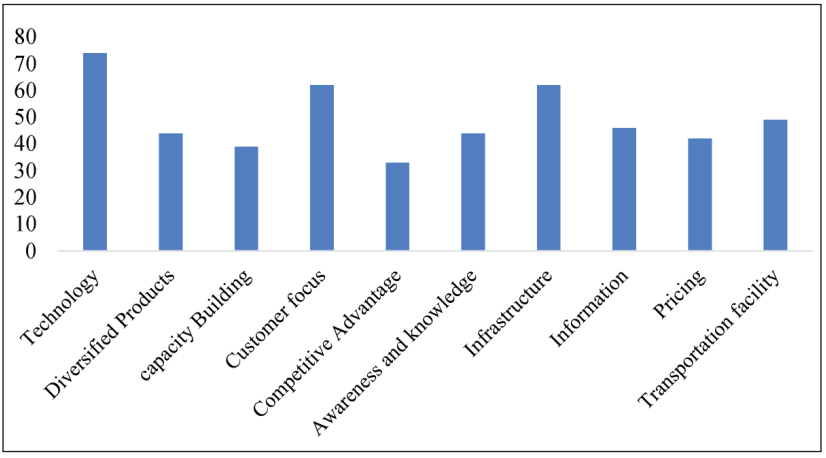

Figure 4. Important Parameters of AVC from Delphi Round.

Source: Created by authors.

Case Studies Analysis

This section discusses the three cases chosen for the study.

Vasundhara Agriculture Horticulture Producer Company Ltd

VAPCOL"is a federation of FPO promoted by BAIF. It follows a three-tier structure.

Evolution of VAPCOL

VAPCOL is a multi-state farmer organisation registered as producer company. It was registered in 2004 has a membership of 55 producer organisations and a membership of 41,000 farmers. VAPCOL is promoted by the Indian non-government organisation, the Bharatiya Agro Industries Foundation (BAIF). It commenced its operation in the year 2008 and generates revenue from the sale of mango and cashew. VAPCOL being one of the oldest companies started by NGO-BAIF was selected to study the AVC. BAIF has been well known for its commitment to sustainable livelihood through agriculture. They organised cooperatives and provided techno-managerial support to sustain the livelihood. To integrate the cooperatives into a single unit to meet the challenges of marketing, a producer company was required to set up. VAPCOL forms a link between the farmers and the buyer. Figure 5 shows the organisational structure of VAPCOL.

The objective of VAPCOL is to form a link between the farmers and the VAPCOL was registered under Section 581-A of the Companies Act, 1956. VAPCOL has members from 15 cooperatives operating in Gujarat, 28 producer organisations in Maharashtra and 12 producer organisations from states such as Madhya Pradesh, Uttar Pradesh, Rajasthan and Chhattisgarh. It is involved in growing agriculture and horticulture crop production, marketing and branding. It is a multi-state second-tier farmer organisation for procurement, grading, marketing, selling, the export

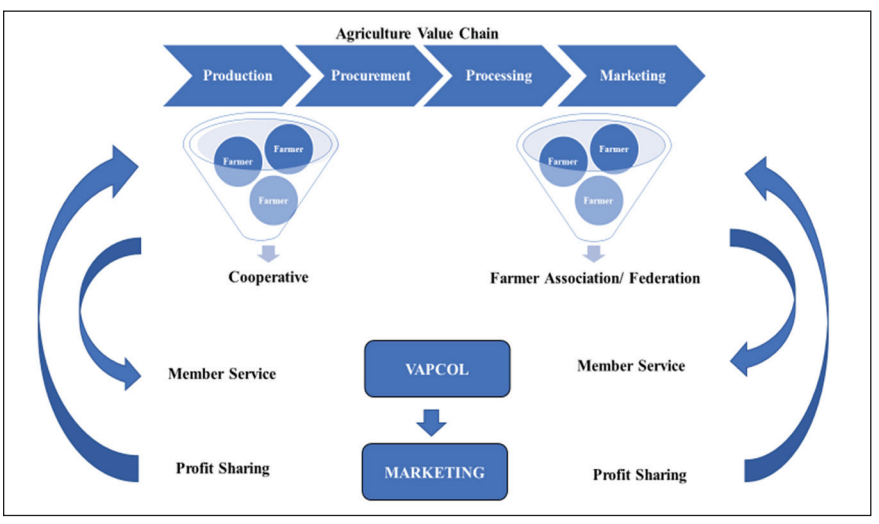

Figure 5. Process of VAPCOL.

Source: Created by authors.

of agricultural goods. It promotes and markets its products with the brand name 'Vrindavan'. It has a wide range of products such as fruits, amla, cashew kernel and vegetables. The branch offices are in Vansda, Peint, Udaipur and Pune. The central headquarter is in Pune, Maharashtra. It has entered into e-market channels such as Snapdeal and Amazon. The producer organisation comprises farmers from villages of south Gujarat, Maharashtra, Rajasthan and Madhya Pradesh. It acts as a direct link between farmers and consumers. There has been cooperation in developed countries who are very successful. In India, agriculture cooperatives have not been able to set an example in the academic world. VAPCOL is funded under the umbrella programme for Natural Resource Management launched by NABARD and Kreditanstalt for Wiedeaufbau (KfW) from Germany. The programme was limited with only NABARD funding for the initial years.

Producer companies have allowed poor and marginalised families in business. The produce is collected from the block level and then sent for further boiling, cutting and processing in the village level processing units. The semi-processed product is transported to the headquarter where the product is graded, sorted and packed for sale with the brand Vrindavan. The processing of mango is created in a single processing unit. Any individual member engaged in production and processing are eligible to become a member of VAPCOL.

Functioning

VAPCOL has promoted a sustainable AVC with principles of developing market linkages for processing, developing its brand, support members in access to technology, establishing facilities, obtaining professional inputs and providing capacity building of member organisation. VAPCOL project was started in the year 2001. They have sustained the livelihood of tribal farmers by focusing on the value chain of amla, cashew nut and mango. Small farmers having an acre of land were brought together to form clusters. Agriculture product is procured from the clusters and processed by the cooperatives. These cooperatives then market the products directly through VAPCOL.

VAPCOL has branches in Nasik, Vansda (Gujarat), Udaipur (Rajasthan) and Raipur (Chhattisgarh). The producer company has been sustaining commodities such as cashew, mango, amla, flowers, milk, tomatoes and vegetables. Vrindavan is the farmers' brand that brings the best quality of processed products such as cashew nut, amla and mangoes along with pickles, pulp, jam and juice. VAPCOL was registered in the year 2004 and began its operation in 2008–2009. It was formed with the purpose to carry out AVC operations and services such as grading, storing, processing, packaging, marketing and export.

Performance

The southern end of Gujarat has a sparse population of tribals. The livelihood of tribals was stabilised by cashew production on small plots of land. There was no procurement and processing of cashew nuts done. BAIF procured machinery such as boilers, dryers and cutters and initiated cashew processing on a pilot scale in March 1998. Around 600 kg raw cashew was procured from the tribal farmers at INR 20/kg and the final product was sold at INR 240/kg. This was a sustainable approach to the AVC. In 1999, four cooperatives were decentralised in different

clusters for the procurement of cashew. The number of cooperatives increased, and each cooperative has its processing unit with 20 staff involved in the value chain process. They build up a standardised system of procurement and processing. The process of the sustainable cashew value chain is explained in Figure 6.

VAPCOL has facilities for e-marketing of their different products (Table 2) in Snapdeal and Amazon. VAPCOL has been awarded FPO Impact Award, 2019. The award has resulted in motivating the VAPCOL for sustaining the AVC.

The VAPCOL model integrates with the research framework as there is an association of farmers who are undergoing the production, processing and distribution of cashew nuts.

The VAPCOL model first brought the farmers together in a form of collectives, that is, various FPCs are formed. Later, these FPCs are integrated into a federation. VAPCOL initiated the production of raw products needed for these processing activities. In that way, we can conclude that VAPCOL has contributed to the strengthening of the AVC for farmers through their collectives.

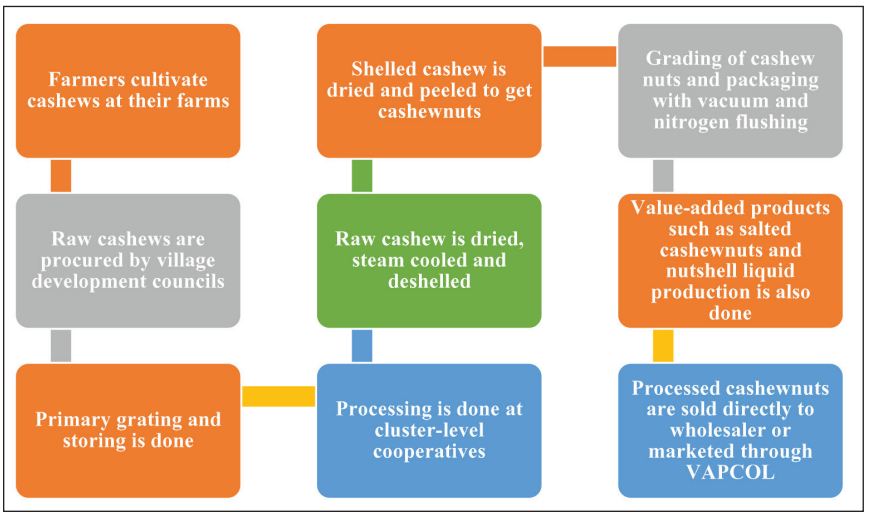

Figure 6. Cashew Value Chain.

Source: Created by authors.

Table 2. Products of VAPCOL.

Fresh fruits	Kesar and Alphonso fresh mangoes in the season
Pickles, preserves	Mango pickle, sweet mango pickle, lemon pickle, sweet lemon pickle, *methia* pickle, mixed pickle, *karvanda* pickle, chilly pickle, mango *chunda*, mango jam, mixed fruit jam and strawberry jam, amla syrup, amla juice, mango crush, mango syrup, strawberry syrup, *kokam* syrup
Pulp and bars	Alphonso and *kesar* mango pulp (aamras), mango slice, amla candy
Dry fruits	All grades of cashew kernels, salted, chilly coated and pepper coated cashew diet nuts

Abhinav Farmer's Club

AFC is a cooperative of farmers headquartered at Pune. The organisation was started to help small and marginal farmers in enhancing their income from the limited land they own.

Evolution of AFC

The journey started around 18 years back. Those days Mr Dnyaneshwar used to practice agriculture along with his father. Initially, they were doing traditional farming and grew 'Indraani rice'. He realised that agriculture is not a very profitable business. To increase his profitability from, agriculture he decided to shift to high-value crops and started doing floriculture. In the process, he realised that a very less population of people use the flower. If one wants to have an impact, one needs to move to a crop that can be sold in volume. He was having an idea of hi-tech cultivation. He attended training on this hi-tech cultivation at Horticulture Training Centre, Pune, for a week. Later on, he started his polyhouse cultivation. The business then shifted to vegetables. NABARD provided a loan to the club and influenced them to grow organic vegetables and fruits.

AFC is an initiative taken by a Farmer Mr Dyaneswar Bodkhe. With Support from NABARD and Canara bank, AFC was formed in the year 2004. The club started on the key cooperative principle of voluntary membership. It began with 11 farmers in Maharashtra cultivating about 153 hectares of land. In the 15 years of existence, the club has grown up to 45,000 farmers across various states such as Maharashtra, Madhya Pradesh, Gujarat, Uttar Pradesh, Andhra Pradesh, Karnataka and Telangana. Looking at the high potential of organic crops in the market, the club decided to go for organic fruits and vegetable cultivation. In these years the club has diversified its presence in various crops particularly fruits and vegetables such as flowers, Indian vegetables, exotic vegetables, fruits, milk and other services. The vision of the group is to have at least one AFC in every district of India to supply organic vegetables, fruits and grains to consumers at an affordable price and also encourage marginal farmers to take up advanced and mechanised farming leaving behind the age-old farming practices.

Functioning

The farmers join the group if they wish to go for organic fruits and vegetable cultivation. They receive training from the AFC. The training covers detailed aspects of doing organic cultivation including sowing, planting, nutrient management, pest and disease management and so on. Largely, cow dung slurry is used for nutrition for the plants. Neem is encouraged to be planted in the fields for disease and pest management in the crops. Once they are trained in organic vegetable cultivation, they can grow vegetables and fruits in their areas. It is strictly monitored that no farmer will use any chemicals for growing their crops. Further, all agricultural produce is brought to the main facility at Pune. At the facility centre, the product is graded, sorted and packed for marketing to society. As the volume of work increased, the group thought of involving women in the club and started forming self-help group (SHGs). These SHGs helped the organisation in diversifying its services. These SHGs helped them in harvesting, sorting, grading,

packaging fruits and vegetables. Several other activities like stage decoration were also taken up by these SHGs. The organisation also collaborated with malls, cash and carry stores, hotels and restaurants and caterers for the supply of their produce. This helped women members generate additional income.

To increase the outreach and scale of the club it was important for the group to motivate other farmers to join them. They felt the importance of creating awareness about their work. This led to the initiative of starting a training centre for farmers. This training centre helps farmer's in gaining knowledge and expertise to go for organic farming. Once the farmer gets into the production of agricultural produce, the farmer can sell their produce to AFC and the club will take the responsibility of marketing. The collective established the women's SHG. These groups work for the club in harvesting, grading and packing of fruits and vegetables, flowers stage decoration and so on. The club also helps people in setting up a kitchen garden. Most of its cultivation is done on playhouses and hence remain unaffected due to the uncertainties in the weather conditions. This helped farmers in maintaining a uniform quality of products as well. Women of SHGs are trained on different harvesting, cleaning, sorting, grading, packaging aspects of the organic products they grow. There is 10,000 youth being trained for the development of various farm machinery. The power tiller shown below has been manufactured by the mechanic engineers of the farm and costs just INR 45,000. The women are involved in picking the farm produce once they analyse the orders in the night and delivering them in the morning. The club also provides training to farmers and provides them with a certification post-completion. Farmer training certification helps the farmers in getting loans easily.

One of the key reasons for the low profitability of agricultural produce is the lack of access to the market. It has been realised that despite consumers paying high prices, the price realisation of agricultural produce for the farmers is very low. It is unfortunate to see that sometimes the farmers do not even get the minimum support price (MSP) for their produce. One of the key reasons for this is the involvement of middlemen in the supply chain. Looking at this factor, the club decided to go for direct marketing. In the early stage, they sold their produce to retail stores, later they moved to the HORECA segment. But, the payment of the product took 3 months to come and for small and marginal farmers this was the biggest limitation. They needed cash on time. Further, they moved to take their products directly to the consumers. At present, the club is supplying fruits and vegetables to 15,000 households in various cities across Maharashtra, that is, Pune Ahmednagar, Jalgaon, Sangli, Kolhapur, Solapur and Satara. It has an annual turnover of INR 400–500 million, with a profit margin of 30%. They own their transport and carry the sorted, graded and packaged produce directly through the consumers.

When the quantum of the produce was less, the direct marketing model worked well for the club. As the club grew and the number of members increased, the total produce of members also increased. This led to the club revise their strategy. They collaborated with IIT Mumbai and started using an application developed by IIT Mumbai for managing the supply chain solution of their produce. This application was developed by IIT Mumbai and funded by NABARD. Earlier SHG women used to collect the orders by calling 7,500 customers. In this process, 20 women and mobile phones were required. The calls made by the company were put under

DND mode. There used to be a miscommunication sometimes where customers ordered a specific quantity and received something extra or less. Moreover, there was so much difficulty in recording the credit. In addition to this, there was a huge amount of cost and time included for making the phone calls. Each lady used to get INR 200 for this job and there was an expense of INR 10 per customer per call.

Seven years back, IIT Powai read an article about AFC in *The Times of India*, and they were asked by NABARD to help farmers; so they developed an SMS system. IIT Powai finally came up with Lokacart. Earlier Lokacart was very slow but they have improved it recently. The customers can even see vegetables and fruits which are out of stock. It also tells about the balance amount which a customer needs to pay in the previous delivery. This application costs just 50 paisa per customer to the club. These operations are being carried out by girls of their members and are being paid INR 30,000.

But the management of app was not proper, and they were facing issues in terms of management of the orders. In the process, they preferred to develop their application and developed an app named 'Abhinav cart'. Now they handle all the supply chains through their app. They have scheduled days for each area and a customer can order on the app. Once they order, they will receive the product on the scheduled day of the delivery. The work process of the AFC is shown in Figure 7.

Performance

AFC has won several awards for its work of organising farmers in groups. It received a national award in the year 2008 for helping small and marginal farmers. Realising the potential of organic vegetables in a city like Pune, the club decided to go for organic fruits and vegetable cultivation. The club provides a range of fruits and vegetables to the consumers including exotic fruits and vegetables too. Through organic fruits and vegetable cultivation, the club has been able to help

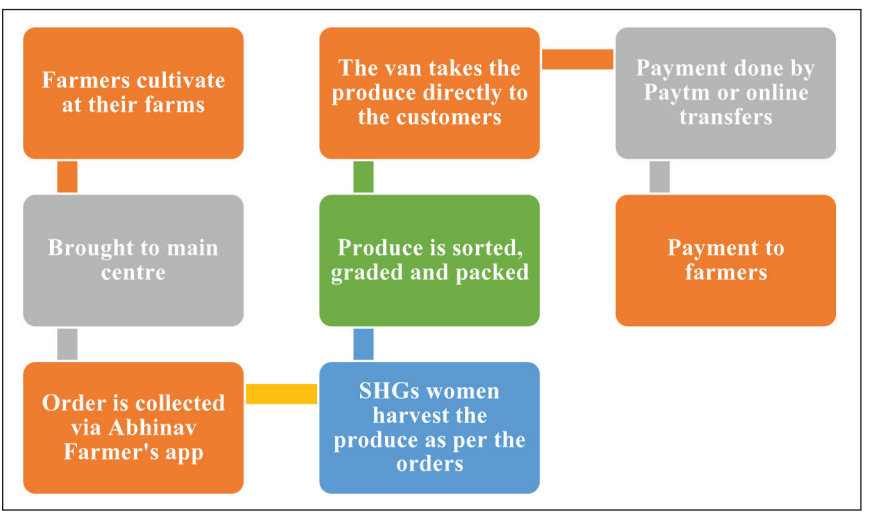

Figure 7. The Work Process of the Club.

Source: Created by authors.

farmers in increasing income through the limited land they have. The daily income of a farmer ranges from INR 1,000 to 2,000 for an acre of land. On average, the monthly income of a farmer ranges between 30,000 and 50,000 from one acre of land. On being asked about plans and export of the produce, Mr Dnyaeswar Bodhke replied that it's a big myth that export is a profitable business. The domestic prices of fruits and vegetables are equally good to provide a farmer with sufficient income. To date, about 45,000 farmers have received training from AFC and about 17,000 farmers started their polyhouses. At present, the group owns a total land of 75,000–90,000 acres, which is used for farming cultivation for fruits, vegetables, grocery, milk and so on. It includes 30% of polyhouses and 70% of land under open cultivations. The group focusses on the use of optimum water and for this, they have set up a drip irrigation system in their fields. The group claims that optimum use of water, the use of advanced techniques for cultivation and reduction in production cost are three important factors of the success of the group. The total annual turnover of our AFC's farmers is around 281 million. A qualified or knowledgeable person give their knowledge to farmers to improve traditional farming by adopting the hi-tech technique, like AFC. The group also focuses on the mixed farming approach. This helps in reducing the input cost by utilising the waste material of each activity. For example, the waste material of agriculture is used to feed their cows and in turn, the cow dung and urine are used for providing organic nutrients to the crops. Today, it has 50 centres, 50 cold storage vans, 250 farmers in Pune and 100 SHG women workers in Pune. Various products that are included to be sold to consumers are various varieties of organic products such as exotic and indigenous vegetables and fruits, leafy vegetables, spices, milk and organic grocery products. The rate of these products is kept at a premium level and is higher as compared to market rates.

Abhinav is a successful club and India needs clubs like Abhinav in all states. AFC is a cooperative form of collectives where farmers have associated with the marketing and production of fresh fruits and vegetables. In the case of AFC, it was evident that the collective has organised farmer's in a group and intervened at various stages of the value chain. They provide training for an improved package of practices to marketing their products to the end consumers, the club has intervened at every step. By introducing the cultivation of organic fruits and vegetables, the club has improved the product portfolio. Further, they involve SHG members in the grading and sorting of the vegetables and ensure to deliver high-quality products to the end consumers. A holistic step of supporting farmers has helped in strengthening the AVC.

Sahyadri Farmer Producer Company

The SFPC head quartered at Nasik has focused on the value addition of perishable agriculture commodities.

Evolution of SFPC

SFPC originated from the distress of the farmers. The farmers are always under stress to control the perishable products and finally get a sustainable income from

agriculture. Despite all the efforts, the farmers have always been the poor sections. The collective and collaborative approach came into existence which resulted in an integrated AVC for sustaining the agriculture income. Sahyadri farms located in Mohadi village of Nashik district started (Das 2019) with around 10 farmers and expanded to 1.5 million in each FPC (Kalia 2019). The FPC started selling fruits and vegetables even in the pandemic situation (Chatterjee 2020). SFPC is the largest aggregator of farmers with around 10,000 farmer producer members and the largest exporter of grapes since 2015. SFPC was registered under the company act in 2010. Mr Vilas Shinde, the chairman of the SFPC, started growing grapes and farming with ten farmers. He handled different perishable crops such as grapes, watermelon and pomegranate, which have a very short self-life. The FPC was able to find solutions for sustaining the AVC. With time it has been the largest global GAP certified farmer group in India where 90% of the farmers were marginal farmers who undergone good agriculture practices (GAP). The SFPC was able to build a strong network and develop an integrated supply chain. The AVC focused on handling fresh fruits and vegetables and forming different value-added products such as ketchup, preservatives, juice, jam, frozen food and garlic paste. The SFPC focused on innovative ERP and technology to trace the backward flow of the product from farm to field. With time Mr Vilas Shinde shifted towards the professionalisation of the AVC by undergoing training and building networks with professional experts (Shinde and Khambaswadkar 2017).

Figure 8 shows that the SFPC has integrated the farmers with different functions forming an inter-functional approach to sustain the supply chain strategic fit.

In 2003, Sahyadri started building up its infrastructure. An APEDA infrastructure was approved to export the produce. Four containers of grapes were exported to European countries in the first order in the year 2004. The company started expanding with marginal farmers from the year 2006 to 2010. By the year

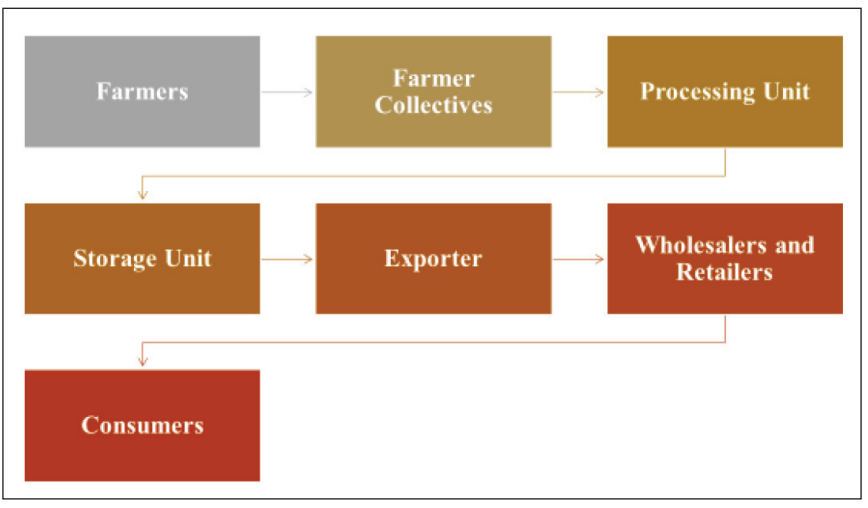

Figure 8. Process of Sahyadri Farmer Producer Company.

Source: Created by authors.

2010, the company branded itself as 'Sahyadri Farms'. Lack of value addition and short self-life of agriculture commodities led to obtain and expand food processing facilities as well as innovative technology and the company started focusing on the integrated AVC. As a result of their efforts, SFPC became the first farmer collective to implement SAP solutions and launched a business to consumers app for the consumers from Mumbai, Pune and Nashik.

Functions

SFPC has focused on sustaining the AVC of different commodities as shown in Figure 9. The fruit, guava, grape, pomegranate, vegetables, floriculture and rice farmer producer functions are performed by SFPC. The SFPC works in the Alandi, Kadwa, Pimpalgaon, Sawargaon, Sinnar and Sonewadi zone of the Nashik district. SFPC focused on grapes, pomegranate, banana, papaya, watermelon, musk melon, tomato, mango and sweet corn. Grapes were grown in over 5,000 acres of land producing 20,000 tonnes of grapes. Tomatoes were also grown in over 5,000 acres of land producing 55,000 tonnes and banana production can be found all over the year in about 500 acres of land producing 5,000 tonnes of the product. Pomegranate production is done in over 500 acres of land resulting in 3,000 tonnes of the final product.

Papaya is cultivated in an area of 150 acres producing 3,000 tonnes of the product. Vegetables were cultivated in 6,000 acres of land producing 60,000 tonnes of the product. Melons are cultivated in 100 acres of land producing 1,000 tonnes. Sweet corn is cultivated in the land of 1,000 acres producing 5,000 tonnes. Mango is produced in about 1,500 acres of land producing 5,000 tonnes of mangoes. Vegetables such as onion, potatoes, tomato, capsicum, drumstick,

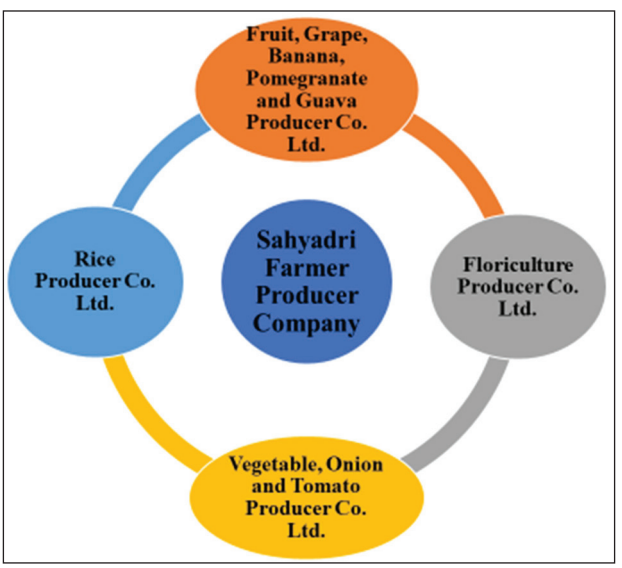

Figure 9. Farmer Producer Cooperatives of Sahyadri Farms.

Source: Created by authors.

chilly, cucurbits, leafy vegetables and cole crops are produced and marketed. To sustain the perishable agriculture commodities, the SFPC has an integrated AVC focusing on aseptic fruit pulp, frozen food, dry fruits, fruit juice, jam, ketchup and IQC fruits and vegetables.

Figure 10 shows that the SFPC has an increasing trend in total sales over the years.

Figure 11 shows the percentage change in total sales and net profit. The data predicts that the percentage change in the net profit is found increasing over the years.

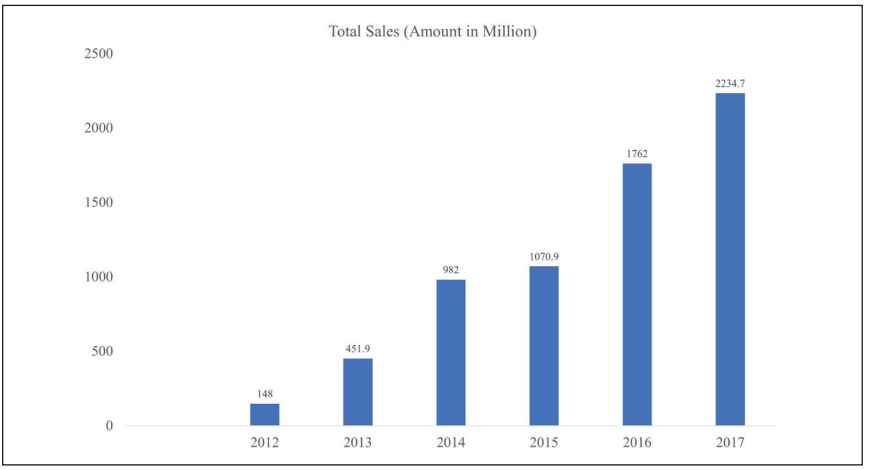

Figure 10. Total Sales of Sahyadri Farmer Producer Company over the Years.

Source: Created by authors.

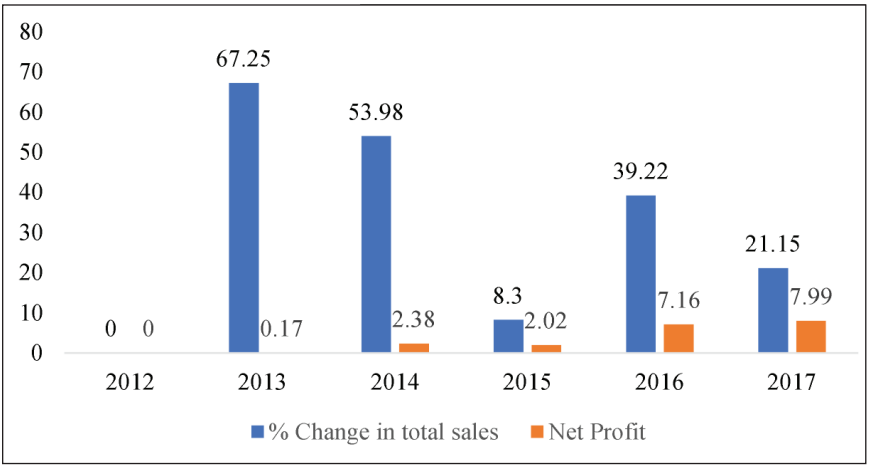

Figure 11. Percentage Change in Total Sales and Net Profit.

Source: Created by authors.

SFPC is a form of a collective FPC wherein farmers are brought together for value addition of agriculture produce and functions of AVC. SFPC again has intervened at every stage of the value chain, that is, from production to the marketing of the product and helped farmers in strengthening the AVC (Hanjagi 2019). SFPC has differentiated itself from other FPC, as along with the domestic market they decided to serve the international market as well. They preferred to explore the export potential of these products for diversifying the market and widen the avenues of selling their produce.

Comparative Analysis of Cases

This study tried to analyse all these cases for their value chain interventions and their impact on farmers (Table 3). It was important to note that all these organisations work to strengthen the income of small and marginal farmers. VAPCOL was initiated by BAIF. VAPCOL was started in the year 2004. AFC was also formed in the year 2004. The seeds of the foundation of Sahyadri were sown in the year 2003 but the formal registration of the organisation was done in the year 2010. The primary reason for starting this organisation was to help farmers market their products which were generated by their 'Wadi' project. In a study on different approaches for the development of agriculture, it was noted that there are two approaches to support agriculture. One is a supply-side approach that is driven by the government or organisation and the other one is the demand-side approach which is driven by individual or FPOs. The study also concluded that the demand-side approach holds a lot of promise for the development of agriculture but was largely ignored (Janvry and Sadoulet 2020). It can be noted in this study that VAPCOL was an organisational initiative and hence was a supply-side approach driven whereas the other two were demand-side driven. In another study in China, it was concluded that community-based collective action has a major role to play in the success of the management of collective goods. The study also concluded that local leadership plays an important role in the success of a cooperative (Liu et al. 2020). As can be seen from the above discussion that AFC and Sahyadri farms were mostly promoted by motivated individuals and the role of local leadership played an important role in the success of the organisation. The major produce taken under their FPOs was processed products of cashew, gooseberry and mango. It was interesting to note that AFC and Sahyadri were founded by individuals who were motivated to help farmers. AFC and Sahyadri focussed on vegetables and fruits. AFC focussed largely on the organic segment and preferred to cater to the premium segment customers in the domestic market. On the other hand, Sahyadri focussed on the export market as well.

One of the key differences was observed in terms of their marketing strategy. Direct marketing as a concept has worked for AFC and Sahyadri. Both these organisations have also developed their app for managing the supply chain of their produce. This has helped these organisations help increase their income, as they were able to substantially reduce the middlemen in the chain. As these organisations are into direct marketing of their products it has been noticed that they have taken the effort to develop their app to connect with the customers.

Table 3. Comparative Analysis of Various Collectives Working for Agriculture Value Chain.

S. No.	Particulars	VAPCOL	Abhinav Farmer's Club	Sahyadri
1	Year of establishment	2004	2004	2010
2	Form of cooperative	Three-tier model, federation of FPOs	Cooperative	FPC
3	Initiated and founded by	Organisational BAIF	Individual Mr Dyaneswar Bodkhe	Individual Mr Vilas Shinde
4	Major produce	Processed products of cashew, Aonla and mango	Various organic fruits and vegetables	Various organic fruits and vegetables
5	Marketing strategy	Marketing through their stores, collaborated with online retail stores, participating in exhibitions	Direct marketing	Direct marketing
6	Technology adoption	No app	Order through own app	Own website as well as own app
7	Market catered	Largely domestic	Largely domestic	Domestic as well as export
8	Areas of operation	Gujarat, Maharashtra, Madhya Pradesh, Uttar Pradesh, Chhattisgarh, Rajasthan	Various cities of Maharashtra	Nashik
9	Target beneficiaries	Small and marginal farmers particularly from remote rural areas	Small and marginal farmers	Small and marginal farmers
10.	Total number of members	41,000 farmers	45,000	1.5 million
11.	Total turnover	1 million	2810 million	2900 million

The literature suggests is inconclusive on deciding which channel is best for the marketing of agricultural produce. In a study in Taiwan on suggesting the best channel for the marketing of agricultural produce, it was concluded that though the government is pushing direct marketing, wholesale markets were identified as one of the most profitable markets for agriculture producers (Lee et al. 2020).

AFC as well as Sahyadri focuses on high-income group people and position their product to working-class people who do not have time to go and purchase and are willing to spend more money to get nutritious and organic products. One of the important things to note in these organisations was all these farmers are largely small and marginal farmers. It is important to note that collective action has benefitted farmers in increasing their bargaining power and reducing the cost of operations.

Shift from Traditional Agriculture Value Chain Collective Action

Traditionally, AVC involved different stakeholders such as producers, traders, wholesalers, retailers, intermediaries and consumers. The collective Action Approach is one such initiative that results in increasing the supply chain surplus and better prices for the producers.

The parameters identified from the Delphi study has been further used to compare the three case in Table 4. It can be observed that the most important elements such as technology, customer focus, transport facility and infrastructure have been taken care of. SFPC is highly successful in AVC as it is rich in the most important parameter such as technology, infrastructure and customer focuses on products and transport facilities. AFC is also rich in technology and has strengthened the AVC. VAPCOL, as compared to AFC and SFPC, is not rich to a great extent in technology and infrastructure. So the parameters contribute to the strengthening of AVC and have been compared in the three collectives.

Information, collaboration and transparency are the researched areas for the value chain. The flow of information among all the stakeholders is required for improving the value chain (Bailey and Francis 2008). In all three organisations, it was ensured that proper information flow is maintained. Value chain transparency should be there at the management, regulatory, public and consumer level. This is possible through the application of traceability, tracking, information flow to the consumers, eco-labels, certification and total quality management (Mol 2015). The growing importance and call for transparency are much required for sustaining the value chains. All these three organisations followed a transparent approach.

The market margin is higher for value-added products (Adhikari et al. 2017). It has been found from the reports that the value chain market margin is higher from the cooperatives as they removed the middlemen from the chain and went for a direct marketing approach, that is, AFC and SFCL. VAPCOL needs to work on a direct marketing concept for increasing the margin for farmers. The local traders and stakeholders also earn better profits from the Cooperatives. Vertical coordination in the value chain is the hierarchical monitoring and alignment of all the activities and information of stakeholders from producers, processors, distributors, retailers and consumers (Bijman et al. 2011). Value chain governance imposes standards for suppliers and consumers as shown in Figure 12 (Altenburg 2006). The outback spirit model depicts the key elements in the supply chain and the collaborations between them (Bryceson 2008).

This study has tried to develop a model of the Agri supply chain for these collectives (Figure 13).

Collaborative efforts with information flow and transparency are essential elements for improvement for the value chain (Taylor 2005).

Table 4. Agriculture Value Chain.

AVC	VAPCOL	AFC	SFPC
Role	The farmers grow and the agricultural commodities are procured. Further, the procured raw materials are processed by collectives.	The farmers grew fruits and vegetables. The role of the club is to do the primary processing and market it.	Dealing with vegetables and fruits, which are perishable products. The focus was given more to processed products to increase the utility.
Role of actors	Poor and marginal farmers at the block level and collectives at the village level are linked for the processing and marketing of value-added products.	Small farmers joining the cooperatives receive training and get assistance for market .	It is a form of the collective that is owned and managed by farmers.
Information flow	Organisation provides information to the farmers and clusters for further processing.	Information regarding the demand for vegetable and fruit is collected via the app.	Organisation provides information to the FPO members.
Transparency	Transparency is maintained in the process from the small farmer clusters and processing by the cooperatives followed by marketing.	The app makes all the data of procurement and selling transparent.	All process is controlled by ERP and blockchain technology so there are complete trust and transparency.
Vertical and hierarchical coordination	Tribal farmers at the block level are integrated with the cooperatives at the village level.	It is a cooperative where farmers are associated with marketing and production.	Chairman, board of members and FPO members coordinate for AVC.
Role of governance	Processing technology, hierarchy governance and market of the value-added products are done.	Relationship-based governance.	Captive and modular governance.
Benefits to chain partners	The profit or surplus is shared among the members.	Training on an improved package of practices, assured market linkage, better price of the produce.	Assured market linkage and better price for the produce.

(*Table 4 continued*)

(*Table 4 continued*)

AVC	VAPCOL	AFC	SFPC
Margin	Product margin is high as the value addition increases the customer's worth.	The higher margin for the product because of direct marketing.	The higher margin on the product because of direct marketing.
Logistic drivers	The capacity, infrastructure and transportation costs were minimised due to collective action.	Focused on the direct marketing of products through Abhinav cart reducing the transportation cost.	Focused on building cold storage and infrastructure for building the value chain.
Cross-functional drivers	Information and pricing of the product were taken care of by VAPCOL.	Proper utilisation of information, communication and technology was found.	Pricing was focused to generate a value chain surplus.
Network building	The cooperative focused on building connections with farmers and the market.	Strong network in urban areas and also with stakeholder like educational institute like IIT Mumbai.	Build up a strong network through quality products in and across the country.
Competitive advantage	The agriculture value chain resulted in gaining a competitive advantage by generating a surplus for the tribal farmers.	A well-known brand for authentic organic produce at an affordable price and prompt delivery services.	Sahyadri came to be known as a brand across the world.

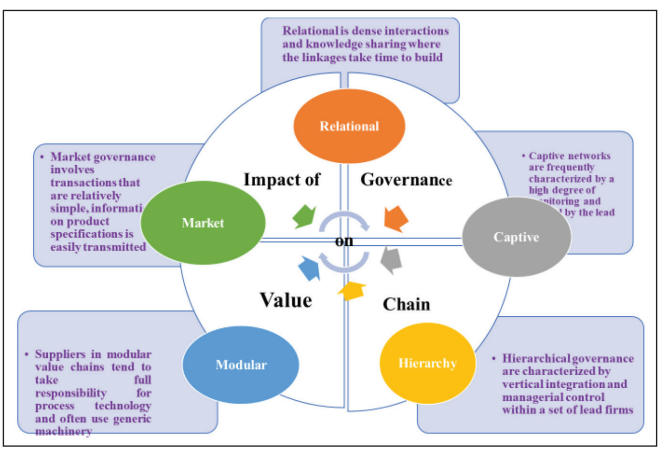

Figure 12. Impact of Governance on AVC.

Source: Created by the authors from Altenburg (2006).

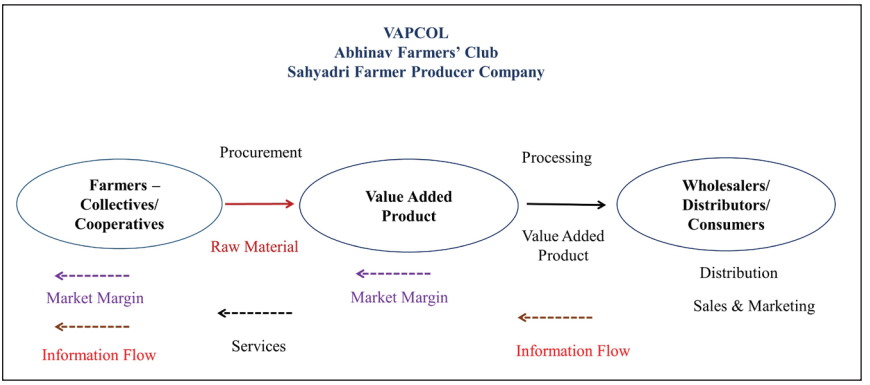

Figure 13. Outback Spirit Model and the Collective Model.

Source: Created by the author.

Implications of the Study

The study has undergone a rich literature review and has explored the three cooperatives. The study will be useful for academicians, researchers, farmers and practitioners who try to build cooperative models in the AVC. The study has drawn a detailed description of the three cooperative models. The cooperative models of Sahyadri, VAPCOL and AFC have been discussed in the study. The study draws the different approaches of the three cooperatives exploring the evolution, functioning and performance. The study has shown a comparative view of the three cooperative models in terms of the type of beneficiaries, marketing strategy, technology adoption, number of members and form of cooperatives. These comparative analyses have helped in further achieving the value chain strategic fit through different approaches. The study has also paved a way for managerial implications. The study will draw the factors, like leadership, and collective action behind a sustainable AVC. The study will drive the practitioners to work upon factors such as leadership, technology and the attitude of the members which can lead to generating a surplus.

Conclusion

The VAPCOL, AFC and SFPC have established themselves as a leading AVC firm developing a strong network design. The FPC has emerged as a successful model for managing and sustaining the AVC. The case study has been followed by a comparative view of the cooperatives and their approaches. Furthermore, the culture of the FPC is different in the three cases undertaken for the study. All three approaches have the ability for business diversification and sustaining the AVC. The study also concludes that leadership played an important role in the success of the collectives. A well-defined marketing strategy will help these agriculture collectives evolve better and succeed in this competitive world.

Limitations and Future Research Direction

The study is limited to a comparative case study approach. The study can be further extended to the empirical analysis of cooperatives and developing a framework on AVC by cooperatives. The study can also be followed by focus group discussions and a mixed approach to derive the drives for the AVC in different cooperatives. The study drives the following future research questions:

- What are the enablers and barriers for collective action?
- What are the challenges for AVC for collectives and cooperatives?
- What are the opportunities for collectives and cooperatives for AVC?

Answers to these questions will help other organisations who will get into promoting similar forms of organisations.

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