

Value Chain up-gradation through collective action: a step towards inclusive growth

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Abstract

Objectives: Small and marginal farmers are being excluded from emerging innovative models owing to the high transaction cost in aggregation, poor quality and information asymmetry among the farmers. There are several opportunities to upgrade the traditional value chains leading to high price realization among the farmers. In the present study, Organic Fruits and Vegetable value chains were analyzed to suggest the strategies for value chain upgrading (Product, Process and Functional upgrade) through collectivization for inclusive growth.

Method: The survey was conducted in Karnataka state in South India, by involving 200 farmers through purposive random sampling drawn from an official list of certified organic farmers followed by interview with 14 other value chain actors, focus group & key informant interviews, direct observation and documents to obtain necessary information.

Findings: Results revealed that, there are five distinct market linkages prevailing involving informal contracts along the chain. Great potential for process and product upgrading through collective action leading to higher price realization and social capital formation among small and marginal farmers.

Application: Results have a potential policy and practical implications for directing Institutions to help smallholder producer organizations for the improvement of organic fruit and vegetable production and processing activities for inclusive agricultural growth.

Keywords: Value Chain Upgrading, Collective Action, Inclusive Growth.

1. Introduction

In developing countries of Asia, the growth of the agricultural sector has been increasingly driven by increased demand for high-value products [1, 2]. One of the largest and emerging economies of Asia is India, in which small and marginal farmers with less than 2 ha of the land account for 85% of holdings, operating 45% of the area. There has been a major shift towards the Production of high-Value Crops in India over the past three decades. Back in 1983-84, the total area under Fruits and vegetable production was a meager 5.1 Mn Ha, which was in stark contrast to areas under coarse cereals and Pulses, which stood at 41.5 Mn Ha and 23.4 Mn Ha, respectively. In 2013-14, the average area under Fruits and Vegetables has increased by over three times to 16.2 Mn Ha, representing a Compounded Annual Growth Rate (CAGR) of 3.9%. In the same period, the production of Fruits and Vegetables has increased at CAGR of 4.8% over the past two decades to average 243.7 MMT in the 2013-14. The reasons for the spurt in High-Value Agricultural Production can be attributed due to the structural transformation of demand patterns of HVP.

This transformation triggered by rising income levels, Urbanization, change in dietary preferences, and increased recognition about the salubrious benefits of consuming fruits and vegetables. The growing demand for High-Value Products (HVP) has opened up opportunities for farmers, to diversify their production and potentially increase farm incomes [3]. However, small and marginal farmers are being excluded from emerging innovative models and are access to insufficient resources and support (vulnerable & excluded, gaps in funding, technical skills, market infrastructure, high transaction cost) [1,4,5]. Hence, understanding how to link smallholders to beneficial high-value markets is of critical importance. Linking small holders with well-functioning high value domestic and global markets and at the same time providing access to value-added products to consumers play a critical part in the long run strategies to increase farmer's income in India.

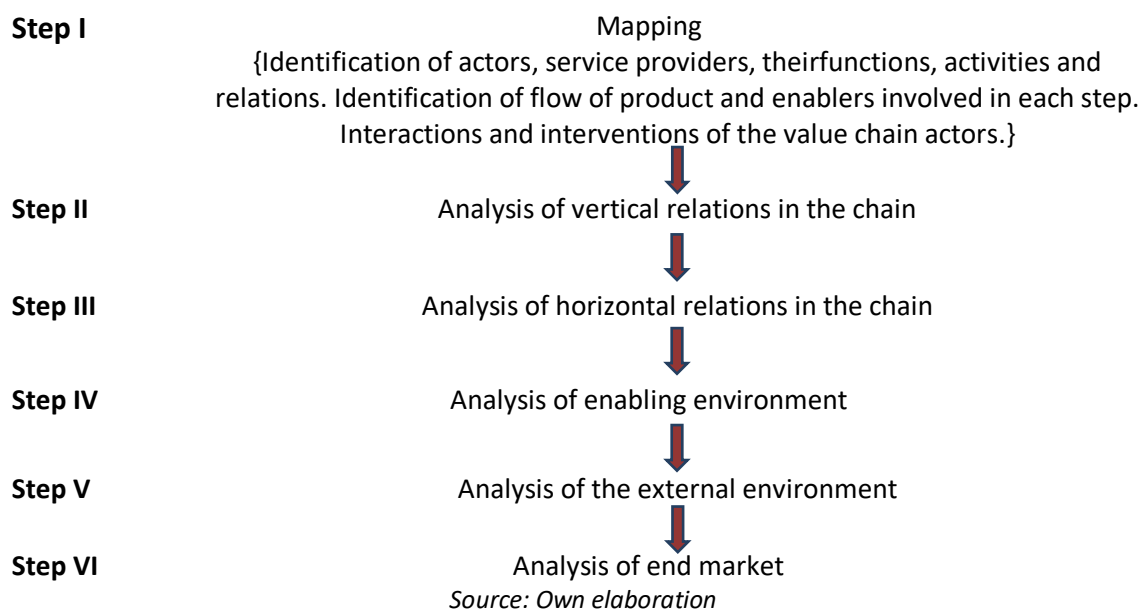
The growing interest of high-value horticulture crops is further supported by consumers who are health conscious and aware of chemicals related hazards [6, 7]. At present, there are 121 million agricultural holdings in India, of which 99 million are small and marginal farmers. The majority of them are poor [8]. Furthermore, three-quarters of India’s poor are based in rural areas [9]. Research has shown that growth generated from agriculture is more effective in reducing poverty than the growth of other economic sectors in developing countries like India [10]. In this sense, agriculture is recognized as an important sector for rural development. Linking smallholder farmers with well-functioning domestic and global markets play a critical part in the long run strategies to reduce rural poverty. Here, the ability to understand how to successfully link poor smallholder producers to relevant and beneficial markets, as well as identifying which markets may benefit what kind of producers, are of critical importance in improving the livelihood of smallholders.

2. The rationale for the study

The emergence of organic fruit and vegetable value chains in India has brought with it opportunities and challenges for the whole local socioeconomic system involving different actors and institutions. However, to assess both the positive and negative impacts of organic fruit and vegetables produced in the local system, it is necessary to reveal the interactions and relationships between the actors and institutions influencing the operations of these chains. Although there has been a proliferation of studies on organic farming, relatively little attention has been directed towards analyzing the interactions and relationships between the producers, supporting markets, and the extent to which their environment enables them to operate. Therefore, the Present paper aims to analyze Organic Fruit and Vegetable value chains and to suggest the strategies for value chain up gradation through collective action towards inclusive growth by small and marginal farmers.

3. Method

The research was conducted in Karnataka state in South India, the first state in the country to implement an organic farming policy. The source of information used in this study was mainly obtained from personal interviews based on the structured questionnaires, carried out on sample of 200 respondents of both organic and conventional farmers. Purposive random sampling was drawn from an official list of certified organic farmers. Further, interviewed 14 other value chain actors to obtain necessary information and more objective understanding of the relations in the chains.

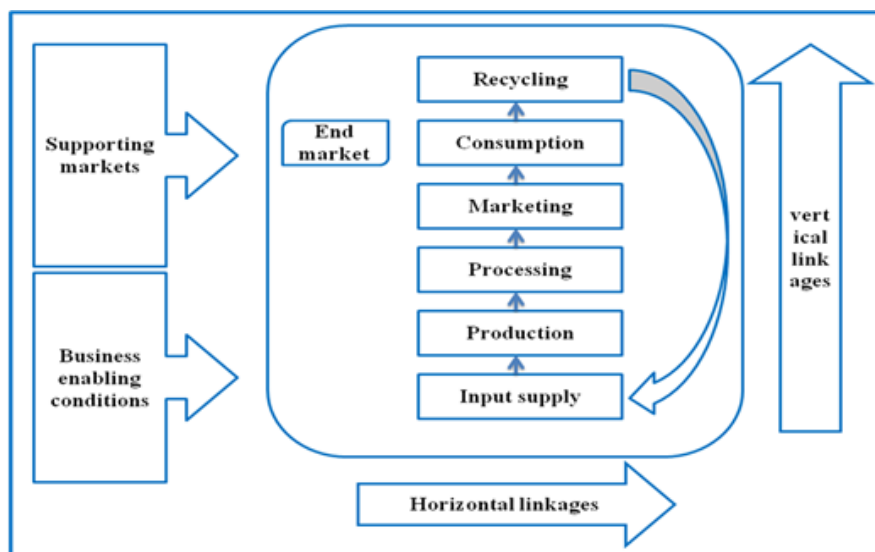


In this study, the methods employed for collecting empirical data are surveyed method, focus-group interviews, key informant interviews, direct observation, and documents. The combination of these different data sources is an attempt to overcome the intrinsic biases derived from using a single source and to explain more fully as well as to give a more balanced picture of the study. There is no clear cut method to carry out value chain analysis. Methodologies differ with purpose and context. Therefore, their application and usefulness vary depending on the circumstances and focus of the analysis. The analysis of the value chain development proposed through six major steps as below:

4. Theoretical background

The value chain consists of all value-generating activities, required to produce, deliver and dispose of a commodity [11]. More precisely, Describes the full range of activities which are required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformations and the input of various producer services), to delivery to the final consumer and final disposal after use”[12]. Based on Kaplinsky & Morris definition, the most commonly used value chain consists of six stages as mentioned in Figure 1.

Figure 1. Common value chain structure



5. Value chain upgrading

Upgrading is a dynamic concept; it allows grasping the changing role of agents in value chains. The upgrading issue was first incorporated into agro-food studies by [13]. He explained the applicability and suitability of VCA to examine questions of upgrading in developing countries. Value chain upgrading can thus be summarized in a broader definition of:

What the actors in a value chain must do to become more competitive and to generate greater value added in the future. The joint improvement of the value chain by private enterprises and their associations is called “value chain upgrading [14].

(a) Product upgrading (U1): Refers to the capability of agents to appropriate rent by means of changing the attribute of a product; i.e.: transforming of an old product into a new product with higher quality, value, and the price. For example, vegetable farmers shift the production of conventional vegetables designated for traditional markets into organic vegetables designated for supermarkets. Product upgrading also includes the introduction of more sophisticated and a completely new product line.

(b) Process upgrading (U2): It can be achieved when the transformation of inputs into outputs is carried out more efficiently; e.g. of value-adding activities, production organization, cost efficiency, productivity, and information flow by, for example, introducing innovative production technology or improving coordination and communication. Process upgrading can take place either within an individual or between chain functions or links.

(c) Functional upgrading (U3): Refers to the capacity to generate and retain rent through the adoption of new functions/skills in the value chain (vertical integration, for instance). Further, assuming or acquiring value-adding activities from the subsequent or previous chain function. For example, forming producer's association performs collective marketing, thereby taking over this value-adding activity from the traders. The introduction of new value-adding activities is also regarded as functional upgrading, for example, when apparel producers design their own product instead of imitating other products.

(d) Network or "relational" upgrading or inter-sectorial or chain upgrading (U4): The process of gaining the rent through changes in the relationships with customers or suppliers. It also refers to moving into new value chain or sub-sector by establishing business linkages with new suppliers and buyers.

In the present study, we use a new typology of innovative upgrading: collective or horizontal upgrading. It refers to the capability to add value to the determined action of agents in the same knob of the value chain, through collective action (ex: by means of farmers' group). Nevertheless, these upgrading categories are defined as distinctive processes, the way most value chain players seeking proper rent is usually through a combination of different types of upgrading mechanisms. This might be very complementary.

6. Results and Discussion

Value Chain Mapping: Actors, Functions, Linkages, and Enablers involved in Fruit and Vegetable Chains. Mapping the value chain facilitates an understanding of the system dynamics and has the capacity to reveal key actors' that are involved, their functions, and linkages with other actors and supporting institutions involved along the chain. Flow of Fruits and Vegetables through Various Marketing Channels in Karnataka, India. The most common marketing channel in case of fruits and vegetables in Karnataka is in the sequence of middlemen to retailers to consumers. Well-organized marketing channel for smallholder farmers rarely exists. However, the marketing of F&V in the study area are carried out in the following ways. i) Farm gate or on-farm selling: this is the most prominent market practice. However, in the exception, a few farmers sell their produce to the buyers at the farm gate. In this mode of marketing, the buying and selling is on an individual basis. Buyers come to the farm gate and transactions happen on the spot with the cash payment. ii) Direct selling: after harvesting farmers themselves do general grading and bring their produce to the wooden or plastic crates and carry them to a nearby city market by bullock carts, motorcycles or by bus.

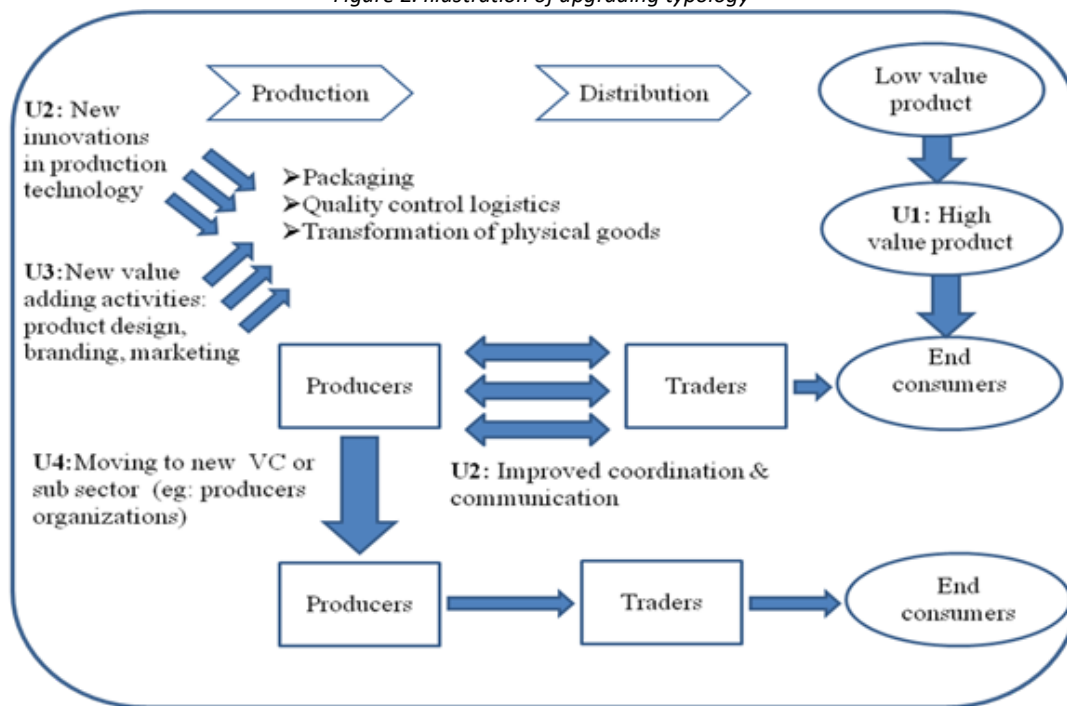
This type of selling mainly exists in the case of conventional fruits and vegetables, when there is a lesser volume of produce. In some cases, they have permanent buyers in the local market and they will go to raith bazar and sell their produce. iii) Selling to middlemen or commission agent: Majority of the conventional farmers in the study area sells their produce through middlemen. Selling to middlemen is an adopted strategy by small-scale farmers, as they face a lot of problems in selling through direct marketing. In some areas where there is no infrastructure, and there is limited farmer's network, a middleman is key to bringing produce into the marketplace. iv) Collective or group marketing: Some farmers group together and bring their produce to the collection centre and market their produce in a group.

Organic farmers in the study area follow such a type of marketing. They are organized into groups to get an organic certification as well as to carry out production and group marketing operations. Furthermore, with their experiences and information received from non-governmental organization (NGOs) group members, they decide which crops to cultivate in their farms. The production of fruits and vegetables is done depending on the seasons by the same group of farmers, but their marketing process and the actor's involvement in marketing are slightly different for both fruits and vegetables. However, the majority of the smallholders of organic farming in the study area are selling their produce through a collection centre. The collection centre is managed by the farmers in a group with the help of an NGO.

In the case of organic produce, both organized and unorganized retailers are procuring the produce from collection centres and delivering produce to the end consumers. Whereas, in the case of conventional produce, the process, starts from middlemen or traders to wholesalers and retailers and finally leads to consumers. The number of stages for a commodity to reach the consumers is more in conventional compared to the organic chain. However, it also depends upon the location of the market and the targeted market to be delivered in the case of conventional produce. Although in the case of organic produce, the available option is limited and only through collection centres to retailers to final consumers. If the demand for organic produce is less on a particular day of harvest, the perishable produce is inevitably sold in a nearby conventional market.

The Value Chain Mapping of F&V: Functions, Actors, and Enablers. In the present study, the value chain mapping; Functions, Actors and Enablers of fruit and vegetable value chains in Karnataka is shown in the Figure 2 and linkages marked from bottom to top. In the middle of the map is a list of actors involved in the sector according to their respective functions. The left-hand side of the map lists the major functions of the chain actors, which includes input supply, production, collection, trading, wholesaling, retailing and upgrading. Further, the institutions supporting the organic sector directly or indirectly are listed as enablers (supporting service providers) on the right-hand side of the map (Figure 3).

Figure 2. Illustration of upgrading typology



Source: Own compilation based on [15, 16, and 12]

In the case of organic fruits and vegetables, the value chain involves product flowing from input suppliers to consumers via producers and retailers. Producers prepare some of the inputs on their own (Ex: Panchagavya, Panchamruta, Beejamruta). In very few cases, they depend on the input dealers. Further, the state government also provides a certain amount of biofertilizers group-wise, for the production of fruits and vegetables. When vegetables (Ex: Tomatoes) are grown and ready for the market, farmers themselves harvest together with their family members and bring it to the collection centre.

A farmer's group operates a collection centre with the help of ICCOA. The farmer's group representative hires local labours at a collection centre for sorting, grading, weighing, packaging and labeling the produce according to the retailer's requirements (Figure 3). Later that produce is marketed to retailers from different parts of Bangalore district.

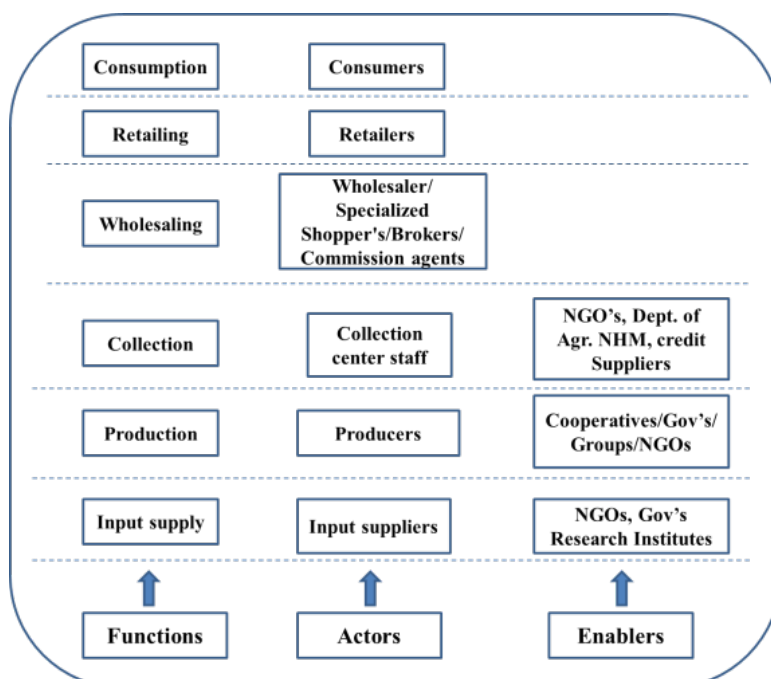
Figure 3. Sorting, grading, weighing, packaging and labelling the produce



Source: Authors own compilation

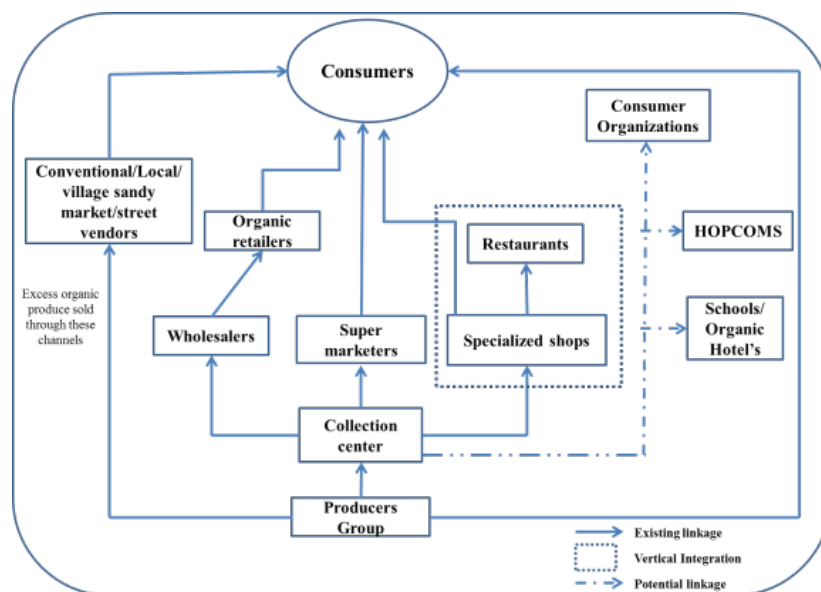
Finally, consumers purchase those produce from the retail outlets or in some cases, delivered to homes. Organic tomatoes are mainly marketed through collection centres. Around 60 percent of the organic tomatoes produced by the sampled small farmers in the study area are collected and marketed through the collection centre. And approximately, 10% of the produce is marketed through the weekly organic markets that exist at nearby cities. The remaining 30% of the organically grown produce are marketed in the conventional markets (through village markets or nearby local market or nearby agricultural produce market committees (APMC's). However, the prices for the organic vegetables are determined by the retailers. They pay a premium depending upon the conventional market price. Organic vegetables are transported by wholesaler/retailers with their pickup tempos or vans. Overall, on an average 60% of the organic vegetables produced in the area are supplied to Bangalore through collection centre. The remaining 30% is sold as conventional produce in the nearby markets. It does not mean that there is no demand for organic produce, but there is no other organized marketing centre, where the farmers can sell organic produce when there is excess volume.

Figure 4. Functions, actors and enablers of fruit and vegetable value chains in Karnataka



Organic vegetables are supplied through the collection centre twice in a week throughout the year, but there is a large difference in the price and volume supplied in the main and lean season. The description of chain activities and functions of actors is a basis to analyze the external environment, information structure and both vertical and horizontal coordination in the organic F&V value chain. The identified actors involved in the organic F&V value chain are shown in Figure 4. These actors include input suppliers, producers, buyers, consumers and some support institutions like ICCOA and Government dependencies. The present study is particularly concerned with local actors; the emphasis made on the description of their functions. Here we understand each value adding an activity or productive process that the product sequentially undergoes from being a raw material up until reaching the consumer. Within the value chains, the various actors have a range of roles and responsibilities as the organic products move along from the farm to the consumer while meeting the certification and quality criteria demanded by consumers. Observed and Potential Linkages of Organic Tomato and Mango Value Chains in Karnataka. The organic fruit and vegetable value chain is a relatively new chain and includes a range of fresh F&V. Compared to conventional value chains it is considered to be very small therefore getting precise data on market share on organic fruit and vegetable are difficult. The Figure 5 illustrates observed and potential organic value chain linkages in the study area. Five distinct market linkages were observed. These linkages showed notable differences in price and payment mechanism, information exchange, investment, financing, coordination, quantity, frequency, extension advice, etc. The linkages between, producers, wholesalers, super-marketers and specialized shops are mainly involving relational/informal contract along the chain.

Figure 5. Observed and potential organic F&V value chain linkages in the study area



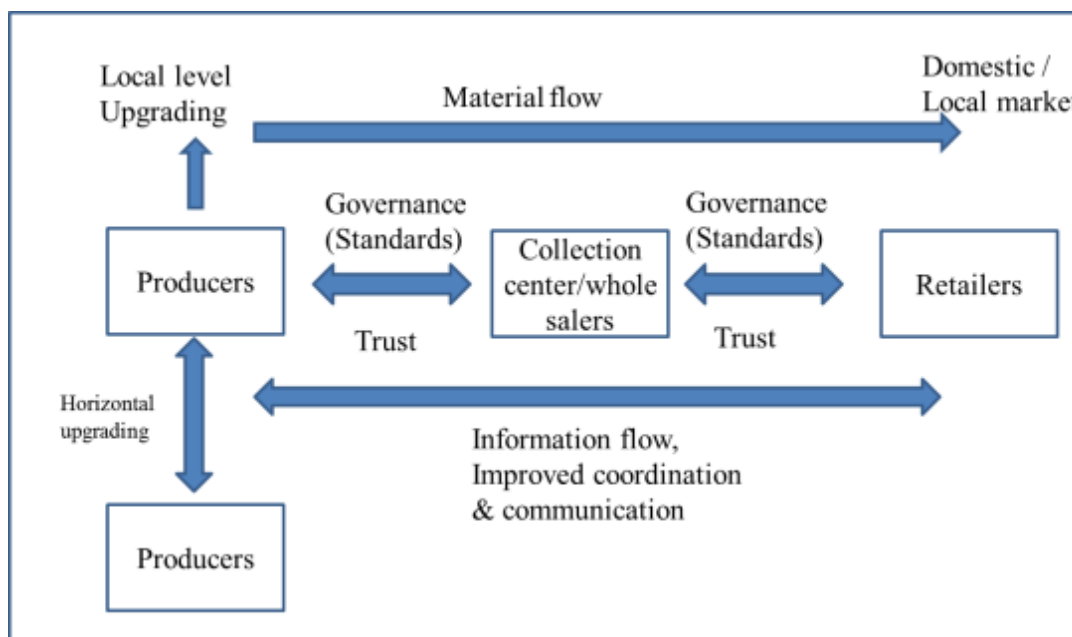
Relatively rare consumer organizations involved in buying organic produce. This is one of the foremost potential linkages in that area. On one flip side producers are located in the nearby city and selling part of their produce through the conventional market. On the other most of the consumers who prefer organic produce in their food basket, but they do not know where the good quality of the organic produce available. Therefore, if consumer organizations exist, then they will get good quality produce, on the other hand, producers will get a market for their produce instead of selling as conventional produce. In addition, organic hotels are adding more numbers in bigger cities like Bangalore; there are much potential for the producers to make a linkage with those hotels in the near future. Finally, HOPCOMS already provides a platform for conventional fruit and vegetable producers group; there is also potential in the coming years to add organic products to it. Presently, state government provides mid-day meals (using conventional fruit and vegetable produce) in the schools. If it changes into organic mid-day meal, the majority of the smallholders will get market linkage for their organic produce.

6.1. Upgrading

Upgrading refers to the acquisition of technological capabilities and market linkages that empower firms to improve their competitiveness and move into higher-value activities [12]. Upgrading in firms can take the form of process upgrading, product upgrading, functional upgrading and chain upgrading. Upgrading encompasses not only improvements in products; it also invests in people, knowledge, processes, equipment and favourable work conditions. Empirical findings from some countries and sectors provide evidence of the importance of upgrading in the agricultural sector [17-19]. However, some competing but overlapping conceptualizations of upgrading in global agriculture value chains exist in the literature.

In this section, we analyze and discuss how the value chain development interactions and interventions contributed to an enhancement of the upgrading capacity and inclusion of smallholder producers in Karnataka. Local smallholder producers can acquire new skills and knowledge in their interactions with other value chain actors. Firstly, the type of relationship in question can determine how information flows and how firms upgrade. Secondly, the implementation and compliance with established standards provide opportunities for learning and acquiring skills and knowledge. Figure 6 demonstrates the interactions and seeks to explain how upgrading took place in local chains, on one side, there is the flow of materials starting from the producers. The material is transferred as it passes through different links in the chain until it reaches the final link: the consumer. On the other, there is implicit knowledge, coordination and communication that are passed through the different links in the form of codified information. Transactions are also taking place between the different actors. One or more links (NGOs, certification agencies) in the value chain have a role in overseeing and coordinating the activities through the various mechanisms. In this interaction, trust-based relationships are formed, and an opportunity to learn and upgrade is opened up to the producers.

Figure 6. Interactions and upgrading in the organic fruit and vegetable value chains



Entering into new markets for the first time is a major challenge for many smallholder farmers in developing countries [20]. It demands new skills and knowledge, for example, standards and requirements, marketing channels, and consumer tastes [21]. Table 1 demonstrates the observed upgrading activities of the fruit and vegetable value chain. Adoption of organic farming itself is a broader form of process upgrading. Improved agronomic practices resulting in higher yield, higher production, and increased sales or increased consumption by the producers themselves, or both. In addition, the processes involved to gain organic certification can impart skills, knowledge and experience.

Table 1. Observed upgrading activities of fruit and vegetable value chains

Type	Observed upgrading activities
Process upgrading Product upgrading	Broader forms of process upgrading are the shift to organic production. Improved agronomic practices resulting in higher yields, and increased sales, increased consumption. The certification process to an organic standard can impart skills, knowledge and experience.
Functional upgrading	Cleaning, Sorting, Grading, Weighing, Packaging, and Labeling.
Chain upgrading	Horizontal upgrading: Smallholder producers coordinate in collective activities in the production and marketing in the form of a producer group/s. Adding new functions to horizontally coordinated firms to meet buyer requirements. Vertical upgrading (integration): Extension services, communication, and information sharing among vertically coordinated actors in the chain. Shortening chains by the exclusion of intermediaries and redistribution of their functions among the partners of a newly formed vertical relationship.

Source: Authors own observation

As outlined in the referenced literature, among the most common interventions in value chains are an improvement of processes within or between nodes associated with the upgrading of product quality. These two upgrading strategies, for product and process, are closely linked. In the present study, the product upgrading was linked to improved processes i.e. the shift to organic production. Certified organic standard not only enhances income potential but also increases product quality. Furthermore, producers add new chain functions such as grading and packaging, thereby improving local employment opportunities. Standards are driven by the process requirements of buyers (e.g. supermarkets) and organic demands by consumers. The upgrading of a product has associated requirements for the upgrading of the process. However, the safety and quality of fresh fruit and vegetables in both the domestic and export markets are decisive factors in buyer and the consumer satisfaction. The inherent perish ability of fresh fruit and vegetables, the long distances they are transported, and the time span between harvesting and final consumption, all mean that increasing consideration has been paid over the past few years to food safety and quality management all along the value chain.

ICCOA played a significant role in the promotion of organic production, marketing and value adding activities for generating improved incomes for smallholder producers in Karnataka, but responsibility for post-harvest operations falls on producers and their organizations. If they fail in the timeliness of their activities related to post-harvest tasks, this affects the quality of the final product when it reaches the buyer and ultimately, the consumer. Also, the value-added aspect associated with organic certification is lost if the quality of the end product is deemed below standard by the consumer. In the present study area efforts have been made or are underway to improve post-harvest operations, as well as quality management through functional upgrading, such as the implementation of on-farm training, a scheduled collection of participants' produce in collection centre, and organized cleaning, sorting, grading weighing, packaging, and labeling. These upgrading strategies require not only learning the requisite skills and developing the capabilities, but also involve changing relationships with buyers and markets [16]. The principle behind the investment in process and product quality upgrading paying off is that better products fetch better prices, in instances where this quality-price linkage fails, investment ceases. In horizontally coordinated groups, they were also supplied with basic machines (functional upgrading) and technical assistance with best practices for the production of high-quality organic fruit and vegetables. This has enabled them to enter into new relationships with buyers (vertical coordination). Additionally, greater yield offers better food security and marketing options in domestic markets.

The cost to the smallholder farmers' group of upgrading their agronomic practices in terms of both time and money has been considerable, though now their income stream has been diversified, they are less vulnerable. The challenge now is to maintain smooth and stable supplies to buyers, particularly given the current erratic rainfall patterns and consequent failure of other household crops. The upgrading of organic fruit and vegetable value chains has resulted in increased human capacity and significant poverty reduction impacts.

Interviewed farmers mentioned that group membership is a prerequisite for inclusion into the group and offers access to other services. The collective experience of the certification process can impart skills, knowledge and experience that improve various groups' ability to stand alone, similar to the collective action for smallholder market access that took place in Africa [22]. However, the organic movement is still in its infancy in India; now there is this more apparent than in the lack of storage facilities for producers of perishable products such as fruit and vegetables. This is a serious limitation for the development of the domestic market. Most parts of the improvements have been financed by the buyers or private organic sector partners and delivered by NGOs such as the ICCOA and government extension agencies. Prices of organic foods are significantly higher. However, there are extra costs in the production process for controlling, labeling and separating organic raw materials and products that need to be recovered through the selling price. All the organic produce from the interviewed producers was reported to be sold to the domestic market. Producers' organizations have post-harvest operations in place to produce constant, high value-added products for the domestic market. However, upgrading activities mainly depend on the nature of the relationships that exist between the major players involved in a transaction. Furthermore, post-harvest operations at the farm and packing house are critical to business success. Some existing linkages try to go beyond the immediate goal of merely improving rural incomes, to enabling rural producers to become overall chain owners. This may call for smallholder producers to get involved in a range of value-adding activities, including produce preparation (cleaning, sorting, and packaging), storage, and transport, and sometimes even retail sale, though the direct sale to consumers in urban areas by peri-urban producers should often be encouraged.

As the interviewed farmers are smallholders, adding value to products (process) happens at the farm level. Without guaranteed returns, this can require significant investment, which in turn, increases the degree of risk faced by smallholder farmers. Producing new forms of existing commodities by starting production of organic fruit and vegetables according to new technical or user-specified commodity forms, for instance, is a huge challenge to smallholder farmers seeking to increase their profits. According to [23], the reward structures in global value chains refer to the rewards or opportunities available to producers in developing countries, and the nature of the roles that trigger special rewards, for example, how premiums and discounts are determined in the market for a particular crop (e.g. quality grades, or securing contracts through forward sales agreements). Many countries lack sizable agro-processors, and while those that do exist may currently have surplus capacity, their ability to absorb additional production is usually limited. Governments and donors promote small and medium enterprises (SMEs) as seen one way to encourage competition and increase value addition [24]. However, this may be constrained by a variety of factors similar to those experienced by the interviewed farmers such as poor infrastructure, a lack of education and entrepreneurial skills, credit constraints, and a non-risk-taking culture, as well as the high cost of imported processing equipment, packaging materials, and lower demand for their produce. For many smallholders, domestic market fresh produce-based food chains have lower entry barriers, but upgrading possibilities are limited partly because of the lack of adequate support for upgrading from both the public and private spheres.

This issue of the nature and scope of institutional support is of crucial importance in their perception of upgrading [25]. The empirical cases of upgrading in the tea and coffee industry in south India have taken from their point of departure in the seminal work of [19], in that [25] argued that the concept of upgrading provides a bridge that links the institutional and governance dimensions of the GVC approach. Their entry point is a relational perspective that treats governance arrangements and institutional formations as being co-produced by internal, place-bound actors and external lead firm actors. The institutional environment of the south Indian tea and coffee plantation sector shapes both upstream producers' capacity to participate in value chains and the economic benefits they obtain from such participation. The same focus on the importance of national and local institutions is found in [26] who found a more instrumental approach to upgrading processes in east Brazilian horticultural exports, which is also based on the original categories put forward by [19]. Importers that source produce for major retailers have offered training and transferred knowledge to potential Brazilian exporters of table grapes, in particular by conveying retailer quality requirements and assisting producers in their attempts to comply with these requirements, thereby upgrading both product and processes. Even though these activities are considered crucial for the success of the grape exporters, [26] stresses the importance of upgrading for national research institutions and marketing boards, as well as local technical service centres and producer organizations.

Similar institutions may be the key for driving the processes that develop into upgrading: they can assist potential supplier firms in gaining access to global markets, and also maintain their position in them [26]. Experts and managers of firms who responded to our survey reported that there is still a need for training services to members regarding organic farming practices, marketing and upgrading activities. They also pointed out that a lack of access to finance prevented the possibility of buying machinery, and it also means that there are no specialized storage facilities or processing equipment. Therefore, in the present case the organic research institutes, governmental and non-governmental organizations, supermarket chains and marketing boards can help smallholder producers' organizations for the expansion of organic fruit and vegetable production and processing activities. Relational contracts with a high degree of coordination exist due to the increase in asset-specific investment by both buyers and sellers. On behalf of the farmers' group, the ICCOA developed specific labeling and branding for the organic produce. ICCOA made the process of collective upgrading possible. This fact, combined with the reported improvement in quality, enabled product differentiation and substantially increased the level of specificity. As the transaction was based on a relational contract, the buyers were able to build trust not only with a pool of producers groups but also with other customers. A higher degree of social capital being developed along the chain enabled the buyers to engage in concerted upgrading with producers and relational upgrading with customers. This study constitutes an example of the combination of horizontal and vertical coordination for value chain upgrading. This process relies on bridging and bonding social capital. In this case, higher levels of social capital reduced the cost of opportunistic behaviour in the transactions, both within the groups and between the producers and buyers of organic fruit and vegetables. Similar results were found in Ethiopia study conducted by [27].

Through their collective action, farmers set up horizontal coordination. Horizontal coordination is the process of greater intra-nodal organization, often in the production and processing node [28]. Among the farmers surveyed for this research, collective activities in production and marketing took the form of a producers group and also through adding new functions to horizontally coordinated institutions to meet buyer requirements. Such collective endeavour was directed to achieve a higher level of productivity. Similarly in Kenya newly formed producers groups performed grading and packaging of fruit and vegetables at dedicated centres to meet buyer requirements [29]. The group membership of the studied farmers is often self-selecting, therefore, horizontal coordination is more beneficial. In contrast, where institutional membership represents a barrier to entry, the poorest are usually among those excluded [30]. Furthermore, the use of groups in value chain upgrading interventions is more effective when functional groups with effective leadership exist, and traditional group structures are employed rather than those imposed by development agents [31]. The imposition of rules in artificial groups may cause the breakdown of social cohesion and longstanding networks [32]. Therefore the development of relationships among actors within functional nodes strengthens the producers' groups.

The purpose of this coordination is to develop economies of scale, increasing functional efficiency and reducing transaction costs. It is often the first step in a sequence of interventions that ultimately facilitate market access, often as a prerequisite for other forms of upgrading, particularly vertical coordination and functional upgrading in the form of shortening the chain by removing intermediaries [5], pooling resources and sharing costs. This is a common feature of organic smallholder producers in the study area, where certification and inspection costs are prohibitively expensive for individuals, so fees are shared among members [33-35]. Currently, they are selling produce through collection centres in bulk outputs which are economically feasible volumes to attract domestic buyers and open up new market opportunities [36]. Also, the producers' group enables access to services and activities such as bulk input purchases, information sharing, training and technical services, and government and NGO support at costs that are lower as a member of a group than they would be for individuals. Similarly, the results of [36] study from India revealed that market information is obtained at high fixed costs for individuals in Indian export horticulture. Therefore, the existence of a producers' cooperative union effectively disseminates information to smallholder farmers at a lower marginal cost. Overall, horizontal coordination makes individuals more creditworthy, which enhances financial stability, in turn enabling investment. These chain-level outcomes translate through increases in individual incomes into household-level outcomes, such as greater assets and improved food security through higher food spending. Where functional, process, product and chain upgrading requires large resource investments, horizontal coordination brings together individual assets.

The smallholder producers' group also developed coordinated relationships among the actors between the nodes. The capacity to develop vertical relationships with other actors was achieved partly through horizontal coordination that is grouping smallholder farmers and coordinating them. However, there is an intensive program of the process and product upgrading at each of the production stages to meet environmental and food quality standards, a prerequisite for supplying to the end markets. For producers who were too scattered to be clustered and who were unable to afford the costs of certification, an inter chain upgrading program should be implemented, in which farmers are initially supported in order to begin the profitable supply of fruit and vegetables to local and regional markets. As mentioned, farmers have informal production contracts, the provision of extension services, information sharing among vertically coordinated actors in the chain. Collectivism also increases bargaining power, resulting in better negotiation outcomes, such as higher premium prices and more favorable terms of business. If prices were stable, even small margins would deliver favourable returns to growers. Collective action also enables the small producer to participate effectively in markets by addressing the issue of their isolation. Shortening chains through the exclusion of intermediaries and redistribution of their functions among the partners of a newly formed vertical relationship were beneficial. As were direct sales to major retailers by fruit and vegetable producers in India, with the supermarkets taking on the transport function and producers bulking and grading at dedicated collection and distribution centres coordinated by farmers' groups. Farmers gained assured markets with increased prices and agreeable payment terms; the supermarkets reduced their costs through elimination of intermediary's fees and gained the reputation of selling high-quality, fresh produce. Increased value-added and more direct linkages with buyers resulting from a combination of strategies that enable functional upgrading – have clearly been demonstrated to improve incomes from the target value chain.

7. Conclusion and Policy implications

The actors involved in the case of organic F&V value chains are input suppliers, producers, buyers, consumers and some support institutions and Government agencies. These actors have a range of roles and responsibilities as the organic products move along from farm to the consumer while meeting the certification and quality criteria demanded by consumers. In Karnataka, organic chains are considered to be new and very small, compared to conventional value chains. Five distinct market linkages were observed. The linkages between, producers, wholesalers, super-marketers and specialized shops are mainly involving relational/informal contract along the chain. Furthermore, these linkages showed notable differences in price and payment mechanism, information exchange, investment, financing, coordination, quantity, frequency, extension advice, etc. The actors engage in these kinds of relational or informal contractual relations primarily to reduce the uncertainty involved in the exchange of organic fruits and vegetables. Also, for economizing the main transaction costs. This indicates that trust between producers and other actors are present. Similarly, frictions are strongly present in relations at the horizontal and vertical level, i.e. within and between smallholder producer groups. There are also potential linkages in that area where both producers and consumers can take advantage. If smallholder farmers groups link to consumer organizations, organic hotels, HOPCOMS, and link to schools, producers will get a market for their organic produce instead of being compelled to sell it as conventional produce. However, at the same time, there are potential advantages; it remains a serious challenge for smallholder organic producer groups with less educated farmers.

The most common marketing channel for smallholder producers in case of organic fruits and vegetables in Karnataka is through Collective or group marketing - Smallholder farmers organized into groups to carry out certification, production, and marketing activities. The production of fruits and vegetables is done depending on the seasons by the same group of farmers, but their marketing process and the actor's involvement in marketing are slightly different for both fruits and vegetables. The majority of the smallholders selling organic produce through collection centres remain to sell through conventional marketing channels. The collection centre is managed by a farmers group with the help of an NGO. Both organized and unorganized retailers are procuring the organic produce from collection centres and delivering produce to end consumers. In case of conventional produce, the chain flow goes from middlemen's or traders to wholesalers to retailers finally to consumers. The number of stages for a commodity to reach the consumers is higher in conventional compared to the organic chain.

However, in the case of conventional produce, it also depends upon the location of the targeted market of delivery. However, in the case of organic, the available option is through collection centres to retailers to final consumers. If the demand for organic produce is lower on a particular day of harvest, the perishable produce is inevitably sold in the nearby conventional market. In conclusion, the local actors acknowledged the need for consensus and long-term perspective of commitment of collaboration between them. Further, they developed joint lines of action that would enable them to sustain and improve their participation in the national and international market of organic fruits and vegetables in the near future. The business relationships between smallholder producers group and other actors indicate a commitment to win-win situations. This situation has created the upgrading prospects of local actors, particularly for producers who have more limited access to resources necessary to cope with the challenges of increasing competition. Seeking, thereby to stimulate a transformation or reorientation in the way local actors work together is imperative to ensure greater stability and presence of local actors in the market. They have pursued collaborative efforts and worked together over the long-term. Therefore, there is more interdependency and power balance shaping their relationship. Finally, social and cultural aspects also have a substantial impact on the commercial relationships among all actors in the value chain of organic fruits and vegetables.

7.1. Upgrading

Upgrading encompasses not only improvements in products, but it also invests in people know-how processes, equipment, and favourable work conditions. Adoption of organic farming itself is a broader form of process upgrading. Improved agronomic practices resulted in higher yields, higher production, and increased own consumption with the interviewed farmers. In addition, the certification process to an organic standard imparted skills, knowledge and experience. In case of perishable produce responsibility for post-harvest operations falls on producers and their groups. If they fail to do post-harvest operations in case of F&V, i.e., fail in the timeliness of their activities, which highly affects the quality of the final product when it reaches the buyer and ultimately to the consumer. Also, the value-added aspect associated with organic certification is lost if the quality of the end product is not acceptable to the consumer.

In the study area efforts have been made to improve post-harvest operations as well as quality management through functional upgrading. Examples of this are such as the implementation of on-farm training, a collective collection of the produce in collection centre, an organization of cleaning, sorting, grading weighing, packaging, and labeling. These upgrading strategies require not only the acquisition of capabilities but also involve changing relationships with buyers and markets. The cost to the smallholder farmers group of upgrading their agronomic practices regarding both time and money has been considerable, and their income stream has been diversified, making them less vulnerable. The challenge now is to maintain a smooth and stable supply to buyers. Particularly given the current erratic rainfall patterns, it is almost impossible for small farmers to manage consistent supply and successfully processing activities. Further, the interviewed smallholder farmers were constrained by a variety of factors for upgrading such as poor infrastructure, lack of education, credit constraints, entrepreneurial skills, lack of risk-taking culture, the high cost of processing equipment and packaging materials.

As the transaction was based on the relational contract, the buyers were able to build trust with producers group. A higher degree of bridging social capital along the chain enabled the buyers to engage in concerted upgrading with producers and relational upgrading with customers. This study constituted an example of the combination of horizontal and vertical coordination for value chain upgrading. The process relied on bridging and bonding social capital. In this case, higher levels of social capital reduced the cost of opportunistic behaviour in the transactions, both within the groups and between the producers and buyers of organic fruit and vegetables. Functional, process, product, and chain upgrading requires large resource investments; horizontal coordination brings together individual assets. The smallholder producers group also developed coordination relationships among the actors between the nodes. The capacity to develop vertical relationships with other actors was achieved partly through horizontal coordination; that is, creating by grouping smallholder farmers and coordinating them. However, there is an intensive program of the process and product upgrading at each of the production stages to meet organic standards (environmental and food quality), which is a prerequisite for supplying to the end markets.

Further, producers who were too scattered to be clustered and who were unable to afford the costs of certification should be encompassed by a (inter) chain upgrading program and manage to integrate in the supply of fruit and vegetable to local and regional markets. The organic movement is still in its infancy in Karnataka. The lack of storage facilities for producers of perishable products such as fruit and vegetable is a serious limitation for the development of the domestic market. Most parts of the improvements have been financed by the buyers or private organic sector partners and delivered by NGOs and government extension agencies. The domestic market found in many smallholders fresh organic produce based food chains have lower entry barriers, but upgrading possibilities are limited partly because of lack of adequate (public and private) support for upgrading. This issue of the nature and scope of institutional support is of crucial importance in their take on upgrading. Governments and donors promote small and medium enterprises as this is seen as one way to encourage competition and increase value addition. Still, there is a need for the delivery of training services to members regarding organic farming practices, marketing and upgrading activities. Also, lack of access to finance prevented the buying of machinery. There is no specialized storage and processing equipment. Therefore, in the present case, the organic research institutes, governmental and non-governmental organizations, supermarket chains and marketing boards can help smallholder producer organizations for the improvement of organic fruit and vegetable production and processing activities.

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