



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Presidential address

Development of agriculture value chains as a strategy for enhancing farmers' income

P G Chengappa

Institute for Social and Economic Change, Bengaluru-560072, Karnataka, India

At the outset, I express my sincere thanks to Dr. P K Joshi, the President, and esteemed members of the Agricultural Economics Research Association (AERA) for bestowing upon me the honour of President-Elect for 2017 annual conference of the Association. I am proud being associated with the Association since its inception, and had the privilege to serve it as its President and Vice President. On this occasion, I wish to place on record the yeomen services rendered by its past Presidents viz. Dr. A S Sirohi, Dr. C C Maji, Dr. Dayanatha Jha, Dr. V Rajagopalan, Dr. S S Johl, Dr. S S Acharya, Dr. Mruthunjaya and Dr. Karam Singh. I am happy that Dr. P K Joshi is now steering the Association to greater heights. I am also glad that the silver jubilee conference of the Association is hosted by the ICAR-National Academy for Research Management (NAARM), Hyderabad under the dynamic leadership of Dr. Ch. Srinivasa Rao. I sincerely appreciate the efforts of Dr. K Srinivas Rao, Organizing Secretary of the conference, faculty members and students for making excellent arrangements for this conference.

For this conference, we have chosen the topic 'Doubling of farmers' income: options and strategies', which is of contemporary importance and is being debated in various forums by academicians, civil society organizations, policymakers, politicians and many others who are concerned with farming and farmers. In view of this, I have chosen to speak on 'Development of agricultural value chains as a strategy for enhancing farmers' income.' Value chains act as an important catalyst in improving farmers' income by strengthening the backward and forward linkages of agriculture. Accordingly, several policy interventions

are being made to organize farmers and facilitate their access to markets, finances, inputs and technologies. Case studies in the Indian context show that farmers who participate in value chains incur fewer transaction costs, face lower market risks and realize more profits. Yet, there remain many weak links in the value chains that need to be addressed for improving their efficiency and inclusiveness.

In India, agriculture still continues to engage over 50 per cent of the workforce, and is one of the main sources of farmers' income, especially small farmers who dominate the agrarian structure and face several constraints in their transition towards commercialization. Towards this, several market-based interventions, such as value chains are gaining ground that not only facilitate farmers' entry into remunerative markets, but also serve as a means to fight against challenges of food insecurity and poverty (Staritz 2012). The value chain approach has potential to increase agricultural productivity, household welfare and build social capital (Rutherford et al. 2016). It is envisioned that through value chains farmers can be empowered to realize better prices and capture benefits of value addition. This is also expected to create sustained demand for food, leading to stable commercial relationships between sellers and buyers. Value chain networks range from local to national and global levels. The globalization is a major challenge for the locally evolved value chains that cater to the demands of domestic consumers. The United Nations Conference on Trade and Development (UNCTAD 2006) concludes that major companies, with a few exceptions, are reluctant to cooperate with local farmers because of structural shortcomings, such as poor quality of produce, uncertain supplies and lack of infrastructure.

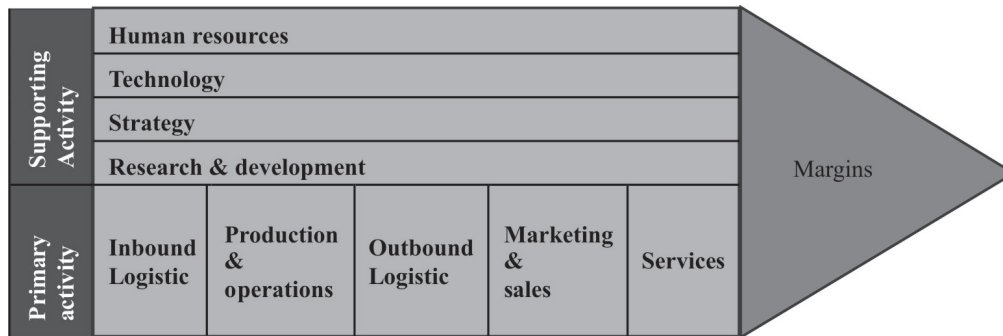


Figure 1. Generic value chain

Source: Porter (1980).

In my address, I shall touch upon four broad areas: (i) concept and models of agricultural value chains (AVCs) prevalent in India, (ii) benefits of AVCs, (iii) conditions for success of AVCs, and (iv) way forward for wider replication of the successful models of AVCs.

1 Conceptual framework and models of AVCs

1.1 Conceptual framework

It was during the 1990s the concept of commodity chains gained ground mainly because of the writings of Michel Porter, Womack and Jones and Gereffi (Kaplinsky & Morris, 2001). The Porter's generic value chain is depicted in figure 1.

A value chain involves a set of actors and activities that add value to agricultural produce before it reaches to end-consumers. According to Dunn (2014) an AVC vertically links or networks business organisations through processing, packaging, storage, transport and distribution. It encompasses the flow of products, knowledge and information, finance and social capital and culminates in the final product for consumers while simultaneously determining price marks and distributing profits at its various stages (Gereffi et al. 2001). Actors on the value chain include integrators, retailers, lead firms, turnkey suppliers, and component suppliers (Sturgeon 2001). The concept of value chain varies in its focus or target markets, although most chains seek to capture complex interactions among organizations and individuals that are required to create and deliver products to consumers. It is typically a range of value-adding activities that vertically link interdependent processes to generate value for consumers and establish horizontal links with other value chains that provide intermediate goods and

services. The value chain analysis provides valuable insights into policy formulation and implementation (Kaplinsky 2000).

In agriculture, the structure of a value chain is that of a pyramid, with farmers at the upstream, firms and middlemen in the middle, and consumers at the downstream. Therefore, to channelize resources it is essential that benefits of value addition trickle down to the masses. Also, farmers need improved market access to coordinate effectively with consumers who need quality products at affordable prices. To implement these facets, AVCs based on modern technology and diversified agricultural products, need to be evolved.

The AVC has evolved from Porter's generic value chain (figure 1) to include a few or all the stages/activities: development and dissemination of plant and animal genetic materials, input supplies, farmers' organization, farm production, post-harvest handling, processing, provision of technologies, grading, packaging local and industrial processing, storage, transport, finance, and feedback from markets. Table 1 elaborates on the role of each chain actor. Organization of agriculture in a value chain framework has been conceived as one of the strategies to bring efficiency in agriculture (Kirsten & Sartorius 2002; Bammann 2007; Trebbin 2014).

1.2 Models of AVCs in India

The traditional marketing system in India is characterised by the dominance of multiple intermediaries between producers and consumers, and a high price spread between them that benefits none. Post-liberalization, there have been significant changes in agri-food marketing systems in terms of rise of

Table 1. Agriculture value chain actors and activities

Agriculture stages	Actors	Activities
Production	Input supplier	Seed suppliers, livestock breeders, fertilizer suppliers, researchers and propagators provide production inputs directly or indirectly through traders or other intermediaries. Primary producers/growers comprising farmers, and livestock keepers.
	↓	
	Primary producers	
Logistics	Aggregators (small & large)	Role in bringing commercial value to the produce. Movement of products from farm gate to large aggregators/processor etc. Warehouse/cold storages improve shelf life of products and price realisation at the producer's level.
	↓	
	Transport & packaging	
	↓	
	Warehouses cold storages	
Processing	Primary processors	Processing by millers/ factories involve two stages of value addition. Initial processing, physical form of produce is changed. Further manufacturing, where initially processed produce undergoes a higher value transformation to become end product for consumers.
	↓	
	Final processors	
	↓	
Marketing	Wholesalers	Marketing and distribution of products by wholesalers, exporters and retailers after purchasing (raw or processed) products from producers, initial processors or food manufacturers. Traders who serve as intermediaries between producers/assemblers/processors and large distributors.
	↓	
	Exporters	
	↓	
	Organized retailers	
	↓	
	Small retailers	

Source: Adapted from Das & Aquino (2013).

integrated food supply chains that coordinate farmers, processors, retailers and other stakeholders. There are also a few export-oriented AVCs catering to the demands of global markets. The export-oriented value chains have additional requirements of quality, certifications, and specialized storage and transport logistics. Value chains for Basmati rice, coffee, tea, spices and cashew are some examples of export-oriented globally competitive value chains. Value chains for domestic market are well-developed for foodgrains, sugar, spices, edible oils, milk, poultry and plantation crops. These are, however, weak for meat, fish, fruits, vegetables and flowers, but are evolving gradually.

A summary of various organizational models of AVCs that exist in India is presented in table 2. Producer-oriented business models are driven from upstream of

the chain. Producers form collectives, i.e. associations, cooperatives, producer companies, self-help groups, to derive economies of scale, access new markets and realise higher prices. Although beneficial for producers, they face difficulties in understanding market needs and preferences, and in securing finances from commercial banks and other such institutions.

Consolidators, processors, traders, wholesalers, retailers and exporters develop their own value chains to secure stable supplies from producers. These are termed as buyer driven value chains. It is in the interest of buyers to ensure a reliable flow of products, and therefore, at times they use finance as a means to make farmers comply with stipulated terms and conditions. Contract farming is the most common form of buyer driven value chain.

Table 2. Organizational models of AVCs in India

Model	Driver of organization	Rationale
Farmer/producer driven	Agricultural producers forming into farmer produce groups: associations/ cooperatives / farmer initiative groups, farmer producer companies, Self Help Groups (SHGs).	Aggregation to achieve economies of scale to reduce transaction costs. Access new markets. Obtain higher market price. Stabilize and secure market position.
Buyer driven	Consolidators, processors, exporters, retailers, traders and wholesalers.	Assure supply. Increase supply volumes. Maintain quality.
Facilitator driven	National and local governments, non-governmental organizations other support agencies - private/ public trustees under corporate social responsibility (CSR).	Provide market access for the poor Regional and local development
Integrated	Agribusiness firms/multinational companies, Certification agencies, Warehouse keepers, Super markets,	New and higher-value markets Assurance of quality Provide scientific storage Procure at low prices and assured supply

Source: Modified based on Miller (2012).

Facilitator driven models are prominent in developing countries dominated by small-scale producers. Cost of organizing and training small producers is high for commercial companies or lead firms. Thus, government agencies and development organizations including non-governmental organizations (NGOs) facilitate integration of smallholders into commercial value chains. Financing is a common feature of such arrangements.

Finally, the integrated value chain, that not only connects producers to other actors in the chain (input suppliers, intermediaries, processors, retailers and service providers including warehouse and financial service providers), but also integrates them through ownership and/or formal contracts. In recent years, some private and public trusts established by business houses to discharge their corporate social responsibility (CSR) have started supporting small farmers in improving their access to markets for outputs and inputs, services, finances and technologies. An integrated value chain has features of other models as well.

2 Benefits of AVCs

In this section, I highlight a few case studies that offer insights into the direct benefits that accrue to farmers from participation in AVCs.

In a maize value chain in Purnia district of Bihar, farmers received an assured price of Rs.1058 per quintal, higher by 11% over that offered by local aggregators (Gupta 2015). If the produce could meet all quality requirements, farmers were given an additional option of selling the produce after three months at a premium of Rs.50 per quintal. Maize is in great demand as feed, and maize-poultry value chain takes form of contract farming (Hellin & Erenstein 2009).

A home-based intervention in broiler farming through a cooperative model by PRADHAN, an NGO, in the tribal dominated Kesla block of Hoshangabad district of Madhya Pradesh has been quite successful in scaling up backyard poultry to the level of an organized retail chain. This contributed significantly towards increasing tribal farmers' income, about 10-fold (Gupta 2015). Similarly, an agriculture production cluster linked value chain in Gumla district of Jharkhand could enhance tribal farmers' income by 150% through diversification and intensification of agriculture (Gupta 2015). The techno-managerial assistance provided by PRADAN has helped developing the production cluster with a strong component of service delivery system.

In recent years, value chains for perishables have emerged in response to their increasing demand. A study on tomato value chain in Karnataka reported

improvements in efficiency in marketing systems, and thereby benefitting to the chain actors (Ramappa & Manjunatha 2016). Farmers could gain more by selling to supermarkets than to other market channels.

The tea industry in India operates its own value chains. But, small tea growers receive marginal benefits, and a larger share of profits is captured by the industry. Buyers, such as Hindustan Lever, Tata Tea, Duncan Tea, Hasmuk Rai & Co., control small growers in the packet tea segment in Assam, Nilgiris and Darjeeling. Also, companies like Teamonk and Tea Trunk source tea from Nilgiris and Darjeeling and market it as signature tea at a premium price. At the other end of the spectrum, cooperatives such as INDCO Tea and TANTEA Estates promoted by the Government of Tamil Nadu have helped tea growers secure better prices by enabling them to improve productivity and quality through strong forward linkages (Mansingh & Johnson 2012).

Chengappa et al. (2014a) analyzed coffee value chains to identify potential entry points as well as constraints in upgrading the value chains in an eco-sensitive region, the Western Ghats. The findings indicate that global trends towards certified products potentially expose conventional chain actors to the challenges of globalization and may deprive them from benefits of the expanding international markets if innovative value chains are not adopted. In another study, they found that group certification with support from NGOs is one of the means to reduce producers' vulnerability, and to secure premium price (Chengappa et al. 2014b).

3 Access to markets, inputs, finance and technology

The empirical evidences suggest that farmers' access to inputs, finance and technology through participation in AVCs has brought an assurance and stability in farm activities and farmers' incomes. Some examples are discussed below:

Access to inputs: Farmers' access to quality inputs, improved technologies and high yielding crop varieties have been found to increase productivity and net income. From an analysis of groundnut value chain in Karnataka, Loksha et al. (2010) identified the need for developing seed value chains for pest-resistant, high-yielding varieties. For pigeon pea farmers,

NCDEX spot market could reduce marketing cost to farmers by 50-70% and enabled them to realize better price by paying a small charge for warehousing.

Although the technological innovations have proven a success, these require up-scaling and value addition along the chain (Sinha & Kumar 2010). In case of cashew, Ramanathan et al. (2010) have shown that efficiency of plantations and of processing can be improved by adopting technologies without any additional use of resources. Likewise, availability of cold storage facilities has helped reduce intermediaries in potato supply chain in Uttar Pradesh (Singh et al. 2010). The cold store operators have also diversified their services by supporting farmers through seeds, credit and transportation facilities. Mahalakshmi & Krishnan (2010) have reported that e-marketing (aquachoupal) and improved quality of services along the aquaculture value chain could contribute directly as well as indirectly to the efficiency of the value chain.

Access to markets: Regulated markets have played a supportive role in the development of value chains. Gauraha et al. (2010) have shown that with improvements in regulated markets and transportation infrastructure, farmers of Chhattisgarh could realize better prices. In the case of vegetables, Kumara Swamy et al. (2010) have reported higher net income for those farmers who were linked with retailers. Pal & Patel (2010) indicate considerable scope to enhance marketing efficiency of Lac as well as farm profits in Chhattisgarh through cooperative marketing and provision of extension services to value chain actors.

The farm-to-market linkages through contract farming help successful marketing of farm produce (Barrett et al. 2012; Sharma 2016). Contract farming in India started with cooperatives in sugarcane and later in dairying, and it has benefitted millions of smallholders. Later on, private sector followed contract farming in dairying, poultry and exotic vegetables (e.g., baby corn, bell pepper and gherkins). This helped farmers accessing remunerative markets. Studies have shown that contract farmers realize higher returns due to reduction in marketing and transaction costs, higher yields and assured prices (Birthal et al. 2007; Chakraborty 2009; Sharma, 2016). Birthal et al. (2007) have also shown that through contracts the broiler farmers could shift as much as 88% of the market risk to integrators.

Certification of organic products fetches premium prices for farmers. A case in point is the export-oriented supply chains for organic Basmati rice in Uttarakhand. The Uttarakhand Organic Commodity Board (UOCB), in collaboration with the government and Ratan Tata Trust, provides training and finances to farmers. The lead firm, Satnam Overseas, provides seeds and other inputs (bio-pesticides and bio-fertilizers) and also finances post-harvest operations (Alam 2007). Satnam Overseas alone has contracts for about 40,000 tonnes of traditional Basmati rice. The Sunstar Overseas also procures organic Basmati rice through similar arrangements. The Himalaya Drug Company sources medicinal herbs through contract farming and pays 10-15% higher than the market price.¹ Organizations, such as Agrocel and Maikaal bioRe, provide technical support and buy organic cotton at a premium of 8-20% (Rieple & Singh 2010).

Access to finance: Value chain finance is viewed as one of the most sustainable and effective means for financial institutions to improve their outreach to smallholders and other chain actors. It enables them to adopt improved technologies and raise productivity. Specifically, financing improves quality and efficiency of AVCs. By identifying activities and actors that require financial support, commercial banks can tailor their financial products to suit the needs of different stakeholders. Avenues of financing value chains include tripartite agreements where farmers' organizations access investment and production loans against supply of produce to the aggregator who undertakes to pass on loan instalments to banks out of the sale proceeds. This has been found to be very useful to both banks and farmers. Some successful initiatives of value chain finance in India are discussed below:

The Anand Milk Union Limited (AMUL), a cooperative marketing federation, is globally acclaimed for its success in enhancing milk production in India. The success is attributed to the integration of market and finance. In this model, producers receive loans from Village Dairy Cooperatives (VDCs) and/or commercial banks. The VDCs also provide cattle feed on credit. At processing level, the activities of packaging, branding and transportation are funded by commercial banks, and at times by the Gujarat Cooperative Milk Marketing Federation Ltd

(GCMMF). The GCMMF borrows from commercial banks and National Dairy Development Board.

Another successful example is that of Vasundhara Agri-horti Producer Company Limited (VAPCOL), a special purpose company, set up by the Bhartiya Agro Industries Foundation (BAIF) in partnership with cashew and mango farmers as owners through equity. VAPCOL sells cashew and mango to wholesale traders and to large buyers including cooperative consumer societies and super markets. After deducting marketing costs, it transfers sale proceeds to its farmer-members. The initial funding to VAPCOL was in the form of grants and equity. Based on their track record of aggregation, the commercial banks have started financing this value chain.

Value addition: Creation or addition of value at different stages of AVC help increasing returns to stakeholders. Rao et al. (2010) found that value addition has contributed to the success of a sorghum value chain in Andhra Pradesh. In case of milk, the traditional informal milk markets have been reported being not as exploitative as perceived (Kumar 2010). Yet, there is scope for improving their performance in terms of standardization of quality and safety, and value addition. Towards this, area or agency specific penetration of the organized sector can bring transparency and accountability (Singh & Datta 2010). Sharma et al. (2010) lay emphasis on small-scale rural industries, and industrial clusters for fruits and vegetables in the producing regions of Himachal Pradesh through fiscal incentives and financing for modernizing processing units, organization of consortia for collective marketing and promotion. Likewise, Prabakar & Sundaravaradarajan (2010) indicate scope for development of value chains through self-help groups (SHGs). Although, additional investments are required for value addition, returns on investment are quite attractive (Wani et al. 2010). Establishment of processing units around production centres along with institutional support and development of market infrastructure enhances the success of AVCs.

4 Conditions for success of AVCs

Having illustrated advantages of participation in AVCs, in this section, I discuss key factors underlying the success of AVCs.

¹<http://himalaya.com.gt/aboutus/cc-community.htm> accessed on 20-10-2017

Institutional arrangements: Group/aggregation approach, as in the case of Farmer Producer Organizations (FPOs), enhances bargaining power of sellers vis-à-vis buyers (Trebbin 2014). Such an approach mobilizes unorganized smallholders and integrates them on the value chain. These, however, require state support, especially financing in their initial stages of development. A study by Kumar et al. (2010) has indicated that innovative institutional arrangements in marketing of fish and fish products could reduce transaction cost through improved marketing efficiency. A fisherwomen cooperative has been quite successful as a social enterprise in terms of management of common drying yards, developing supply chain for salt and providing credit to its members (Gunakar et al. 2010). On similar lines, SHGs in seaweed farming have proven a success in coastal resource management with strong income generation and gender orientation (Krishnan & Narayanakumar 2010). Likewise, in dairying the SHGs with support from Krishi Vigyan Kendras (KVK) could develop an innovative organized marketing system (Shrivastava et al. 2010).

Kudumbashree, a community network in Kerala, has emerged as an innovative value chain for microenterprises. Primarily, it is a poverty alleviation, women empowerment programme started by the State Poverty Eradication Mission of the Government of Kerala in 1997. *Kudumbashree* is a three-tier structure, with Neighbourhood Groups (NHGs) at the bottom, Area Development Societies (ADS) in the middle level, and Community Development Societies (CDS) at the local government level. As in March 2017, the network had a membership exceeding 4.3 million from more than 50% of the households. One of the key components of the economic empowerment is the value chain activities that have been found to augment income and livelihood security (Prema & Lisma 2010).

The other example of an institutionally-backed successful value chain is that of 'Mahagrapes', a partnership firm of 16 grape growers' cooperatives involving 2500 growers in Maharashtra. Mahagrapes provides input support to farmers (through bulk purchase and in-house production). Farmers receive price of their produce based on its quality. The success of Mahagrapes has demonstrated that the multi-specialized intermediaries can play an important role in linking small farmers to overseas markets (Roy &

Thorat 2008; Kumar & Sharma 2016). Similarly, HOPCOMS (Horticulture Produce Cooperative Marketing and Processing Society Limited) in Karnataka and SAFAL in Delhi are successful cooperative value chain ventures (Birthal et al. 2007). Birthal & Joshi (2007) have shown that SAFAL farmers on an average, realize 8% higher prices and incur 92% less towards marketing costs over those selling in the open market.

Agriculture clusters: Crop intensification and diversification have been promoted through developing agriculture production clusters in most value chains. These have significantly increased scale of operation of AVCs, attracting distant buyers, financial institutions and service providers to support operations of the clusters. A typical example is the cluster of processing and marketing of cashew (Harilal et al. 2006).

Link producers to markets, and market development: The efforts made by the chain leaders to link producers to nearby as well as distant markets have helped producers to realise higher returns. Moreover, they are assured of the market for their produce. In many cases, it helped them to link with institutional buyers, for example the NCDEX platform of accredited warehouses helps farmers to get rid of intermediaries in the chain.

Initial working capital grant and credit to producer group/producer company: Initial working capital grants by the governments under Rural Livelihood Enhancement Project, and loan provided by Cluster Level Federations and NABARD to Producer Companies have helped them to meet their essential working capital requirement, make payment to members in a reasonable time, and attract others to sell to the companies than to local aggregators. Access to working capital has been important to finance initial investment required to transit from cereal-centric mono-cropping system to diversified high-value crop production system (Gupta 2015).

Organized food retail chains (FRC): Modern food retail chains have created new avenues to reduce risks and increase returns through value chains. A few FRCs have established backward linkages to change method of farming as well as marketing processes (Chengappa et al. 2007). Direct supplies by farmers allow retail chains to retain control over quantity, quality and price. For example, Spencer has introduced a novel

agribusiness model for marketing of agricultural commodities. Chengappa et al. (2016) found that young and educated large farmers tied up with Spencer's Consolidation Centre in Hoskote, Bangalore earning higher income compared to those selling directly in traditional markets. The main reason for low participation of small farmers was due to their inability to invest in tube-wells for irrigation. Large farmers were at an advantage in cultivation of exotic vegetables that fetch higher prices. Obviously, there is a need to improve participation of small farmers' in the modern food value chains keeping in mind quality and food safety requirements (Reddy et al. 2010).

Incentive structure for village resource persons and community extension agents: Attractive incentives linked to procurement of produce from producer groups is essential for motivation of village resource persons and community extension agents.

Technical assistance from chain leader /NGOs: Intensive technical assistance by the corporate/NGO helps developing innovative models and sustain them through various interventions at different stages of value chain. Organisation of collective institutions and provision of services to support smallholders' production are critical for the success of AVCs.

Capacity building: Labour is one of the important inputs in production process, and the value chain concept viewed from the perspective of value addition needs to focus on improving capacity of farm workers. This is witnessed in an institutional initiative by the Kerala Agricultural University that constituted a group called 'Food Security Army' with the aim to promote mechanization of paddy farming by training the educated unemployed rural youth. This intervention has resulted in improving living conditions of the participants (Devi et al. 2010). Capacity building in different aspects of production, post-harvest management and marketing of coriander in Rajasthan has contributed towards enhancing farm incomes (Dhaka & Poonia 2010).

Innovations: A number of key innovations as listed below can play important role in consolidating AVCs at both their upstream and downstream:

- **Process innovations** help in development of business models, contract farming systems, commodity exchange linkages and other aspects of AVCs.
 - **Financial innovations** include use of interlinked supplier-buyer-producer-bank financial arrangements to reduce cost and risk. Such linkages can greatly reduce the need for cash payments and transactions that increase financing costs.
 - **Technological innovations** consist of application of ICTs in agricultural extension, mobile technical support, mobile banking, electronic networks and improved management information systems to accommodate the tailored financial services – all of which have made AVCs much more feasible.
 - **Policy innovations** help reorientation of extension services towards strengthening value chains and invest in supportive infrastructure. These should focus not much on high cost technologies and untested ideas but on all types of innovations that reduce costs and risks, and improve services.
- Some other factors that need to be considered by value chain developers are:
- Existing markets:** Existence of a market is a precondition for the success of AVCs. The deficit markets within a radius of 200 km are great enablers for agriculture production clusters, as these act as immediate demand centres for agricultural produce (Gupta 2015).
- Selection of commodity:** For successful replication of AVC, the following factors have to be kept in mind before selection of a commodity.
- Commodity should be tradable as per the requirement of the market.
 - Majority of the producers should be engaged in commodity production to ensure economies of scale.
- Selection of area:** Most AVCs are regional in nature because of the differences in relative advantage in production of different commodities. For their successful replication, the following factors have to be considered:
- An assessment of the potential for production in terms of agro-climatic conditions, such as temperature, rainfall, humidity, quality of soil and water required for production of the selected commodity.

Table 3. Upgrading strategy for AVCs

Strategy	Process
Entry in to the value chain	Switch from traditional to high-value agriculture, and from traditional marketing chains to modern marketing chains
Process upgrading	Adopt new technologies –seed, fertilizer, new methods of planting, drip irrigation, protected cultivation, harvesting at right time, good agricultural practices and traceability,
Product upgrading	Production of high-value commodities such as organic products, certification costs arise.
Functional upgrading	Processing of produce in addition to cultivation- dal, multigrain millets- value addition costs arise
VC upgrading	Expansion from production into agro-tourism, home-stays in plantations.

Source: Author's compilation.

- The area should ideal for development of a production cluster i.e. producing a commodity with uniform features at a scale.
- The area should have access to good roads for quick and efficient movement of heavy vehicles.
- The area should have good telecommunication connectivity for smooth flow of information across stakeholders.

Beneficiary characteristics: The ideal beneficiaries to undertake intensive operations are those who have enough time and labour.

Strong culture of community collectives: Most AVCs have met success when there existed some kind of formal and/or informal collectives like SHGs and cooperatives/associations. The existing groups provide social mobility required for undertaking economic activity. Therefore, it has to be considered whether the potential area of intervention has a culture of formal and informal community collectives on which the AVC can be built upon. Services ranging from livelihood plan development to collective marketing of agriculture produce are provided to SHGs making it viable for service providers to engage with them. In particular, the success of high repayment of micro-credit loans in India can be attributed to the strong bank-SHG linkages.

Funds to invest in rural infrastructure: Initial funding from donors or governments for infrastructure development, such as aggregation centres, is good enabler for development of production clusters. This attracts investment from private sector as well.

Upgrading strategy of AVCs: In the long run, AVCs should develop strategies for their upgradation as indicated in table 3. There should be a continuous upgradation of the processes, products, and functions in line with the emerging market conditions.

5 Conclusions and way forward

Globalization has exposed farmers to unfamiliar vulnerabilities and challenges. Hence, to deal with these, the smallholder production systems need to improve their performance and competitiveness. Towards this, studies have indicated a three-pronged approach: (i) use of diversified and innovative upgradation strategies at different levels of value chain through provision of technical and financial support, (ii) transformation and up-scaling of local AVCs to higher levels to capture benefits of the expanding domestic and international markets and to meet the challenges of privatization and globalization, and (iii) institution building for value chain governance in favor of smallholders (Choudhary et al. 2015). Various forms of AVCs are being practiced to organize farmers, facilitate their access to technology and larger markets. Emergence of producer organizations, effective value chain finance, innovative interventions and capacity building have contributed to the success of AVCs.

In conclusion, the organization of AVCs inclusive of small farmers is an effective strategy to improve efficiency and value addition. Thus, AVCs should be seen as an important component of the strategy of doubling farmers' income. Towards this, the following prescriptions are suggested:

- Create awareness on the importance of value creation and value capturing, and sensitize actors

in the AVC on the need for strong links between agribusiness and smallholders.

- Continue to build/up-scale AVC analytical capacities, especially at regional and district levels to ensure effective and sustainable mainstreaming of AVCs.
- Promote good practices and access to timely information to improve bargaining power of farmers vis-à-vis buyers.
- Aggregation issues that include lack of uniform quality, sorting and grading technology and appropriate storage needs to be resolved to infuse efficiency in processing and marketing.
- Up-scale and replicate innovative models of linking producers with agro-processors.
- Invest in rural infrastructure that connects farmers with markets and help reduce post-harvest losses.
- Support innovations and technologies for developing competitive value chains.
- Reduce transaction costs and strengthen networks with emphasis on inclusion of women, poor, and/or marginal groups.
- Reinforce agricultural transformation with social strategies to protect farmers from negative effects of market liberalization and privatization.
- Address governance issues in agri-food system, giving emphasis on product differentiation, food safety, and product standards that are required in a competitive market environment.
- Encourage private sector engagement through public-private partnerships for enabling farmers to move up in the value chain.

References

- Alam, G. (2007). Appraisal of financing mechanisms, marketing strategies and value-adding opportunities in the organic sector as tools for enhancing farmers' income-generation - a study of organic basmati rice in Uttarakhand, India. Centre for Sustainable Development, Dehradun, India,
- Bammann, H. (2007). Participatory value chain analysis for improved farmer incomes, employment opportunities and food security. *Pacific Economic Bulletin*, 22 (3), 113-125.
- Barrett, C. B., Bachke, M. E., Bellemare, M. F., Michelson, H. C., Narayanan, S., & Walker, T. F. (2012). Smallholder participation in contract farming: comparative evidence from five countries. *World Development*, 40 (4), 715-730.
- Birthal, P. S., Jha, A. K., & Singh, H. (2007). Linking farmers to markets for high-value agricultural commodities. *Agricultural Economics Research Review*, 20 (conference number), 425-439.
- Birthal, P. S., & Joshi, P. K. (2007). Institutional innovations for improving smallholder participation in high-value agriculture: a case of fruit and vegetable growers' associations in India. *Quarterly Journal of International Agriculture*, 46(1), 49-68.
- Chakraborty, D. (2009). Contract farming in India: unique solution to multilayer agricultural problems? *Review of Market Integration*, 1(1), 83-102.
- Chengappa, P. G., Achoth, L., Mukherjee, A., Reddy, B. R., Ravi, P. C., & Dega, V. (2007). Evolution of food retail chains in India. In: *Agricultural diversification and smallholders in South Asia* (P. K. Joshi, Ashok Gulati and R. Cummings (Jr), eds.). Academic Foundation, New Delhi.
- Chengappa, P. G., Rich, K. M., Rich, M., Muniyappa, A., Yadava, C. G., & Pradeepa, B. B. (2014a). Promoting conservation in India by greening coffee: a value chain approach. NUPI Working Paper 831, Norwegian Institute of International Affairs, Oslo.
- Chengappa, P. G., Rich, K. M., Muniyappa, A., Yadav, C. G., Ganashruthi, M. K., Babu, P., & Shubha, Y. C. (2014b). Sustainable coffee certification in India: perceptions and practices. NUPI Working Paper 830, Norwegian Institute of International Affairs, Oslo.
- Chengappa, P. G., Mangala, K. P., & Dega, V. (2016). Is farmer-food retail chain linkage feasible? In: *Organized retailing and agri-business, implications of new supply chains on the Indian farm economy* (N. Chandrasekhara Rao, R. Radhakrishna, Ram Kumar Mishra and Venkata Reddy Kata, eds.). Springer India.
- Choudhary, D. Kunwar, M.S. & Rasul, G. (2015). From farmers to entrepreneurs – strengthening Malta orange value chains through institutional development in Uttarakhand, India. *Mountain Research and Development*, 35 (1), 4-15.
- Devi, P. I., Hema, M., & Jaikumaran, U. (2010). Value chain in poverty alleviation—a model for institutional initiatives for organizing and capacity building of farm workforce. *Agricultural Economics Research Review*, 23(conference number), 523-526.

- Dhaka, B. L. and Poonia, M. K. (2010) Improving coriander value chain performance through capacity building to enhance farm incomes. *Agricultural Economics Research Review*, 23(conference number), 548.
- Dunn, E. (2014) Smallholders and inclusive growth in agricultural value chains. Field Report 18. Gainesville, Florida.
- Gauraha, A. K., Banafar, K. N. S., Pathak, H., & Chandrakar, M. R. (2010). Role of regulated markets as supportive activities in value chains of agricultural commodities. *Agricultural Economics Research Review*, 23(conference number), 548.
- Gereffi, G., Humphrey, J., & Kaplinsky, R. (2001). Introduction: globalization, value chains and development. *IDS bulletin*, 32(3), 1-8.
- Gunakar, S., Ramachandra, B., & Raghurama, A. (2010). Supply chain management in a social enterprise: a case study of fisherwomen cooperative in coastal Karnataka. *Agricultural Economics Research Review*, 23(conference number), 566.
- Gupta, A. K. (2015). Case studies of successful pro-poor models in India. National Rural Livelihood Project, The World Bank. http://www.ruralfinanceandinvestment.org/sites/default/files/Case%20studies%20of%20pro-poor%20value%20chain%20model%20in%20India%20_Abhinav_v2-1.pdf. accessed on 24 October 2017.
- Harilal, K. N., Kanji, N., Jeyaranjan, J., Eapen, M., & Swaminathan, P. (2006). Power in global value chains: implications for employment and livelihoods in the cashew nut industry in India. International institute for environment and development (IIED).
- Hellin, J., & Erenstein, O. (2009). Maize-poultry value chains in India: implications for research and development. *Journal of New Seeds*, 10(4), 245-263.
- Kaplinsky, R. (2000). Globalization and un-equalization: what can be learned from value chain analysis? *Journal of Development Studies*, 37(2), 117-146.
- Kaplinsky, R., & Morris, M. (2001). A handbook for value chain research (113). IDRC, Ottawa.
- Kirsten, J., & Sartorius, K. (2002). Linking agribusiness and small-scale farmers in developing countries: is there a new role for contract farming? *Development Southern Africa*, 19(4), 503-529.
- Krishnan, M., & Narayanakumar, R. (2010). Structure, conduct and performance of value chain in seaweed farming in India. *Agricultural Economics Research Review*, 23 (conference number), 505-514.
- Kumar, A. (2010) Milk marketing chains in Bihar: implications for dairy farmers and traders. *Agricultural Economics Research Review*, 23 (conference number), 469-477.
- Kumar, N. & Kapoor, S. (2010). Value chain analysis of coconut in Orissa. *Agricultural Economics Research Review*, 23 (conference number), 411-418.
- Kumar, G., Ravisankar, T., Suresh, R., Bhatta, R., Vimala, D. D., Kumaran, M., Mahalakshmi.P. & Devi, T. S. (2010). Lessons from innovative institutions in the marketing of fish and fishery products in India. *Agricultural Economics Research Review*, 23 (conference number), 495-504.
- Kumara Swamy, D., Eswara Prasad, Y., & Raju, D.S.N. (2010). Impact of retail sector on farming community. *Agricultural Economics Research Review*, 23(conference number), 568.
- Lokesha, H., Kiresur, V. R., Rao, P. P., & Bantilan, M. C. S. (2010). Value chain management in production and marketing of groundnut in Raichur district of Karnataka. *Agricultural Economics Research Review*, 23(conference number), 547.
- Mahalakshmi, P., & Krishnan, M. (2010). Evaluation of e-marketing system in aquaculture value chain: a study of an aqua-choupal model in West and East Godavari districts, Andhra Pradesh. *Agricultural Economics Research Review*, 23 (conference number), 566.
- Mansingh, P., & L. T. Johnson. (2012). Comparative analysis of existing models of small tea growers in tea value chain in the Nilgiris. NRPPD Discussion paper 20, Centre for Development Studies, Thiruvananthapuram, Kerala.
- Miller, C (2012) Agricultural value chain finance strategy and design, Technical note, IFAD. <https://www.ifad.org/documents/10180/8d74b792-33e4-4f57-96b4-e348af035a3c> accessed on 24 October 2017.
- Pal, G., & Patel, B. (2013). An economic analysis of lac marketing in Kanker district of Chhattisgarh. *Indian Forester*, 139(3), 256-259.
- Porter, Michael E. (1980). *Competitive strategy: techniques for analyzing industries and competitors*. The Free Press, New York.
- Prabakar, C., & Sundaravaradarajan, K. R. (2010). Value addition in tuna— a potential business venture. *Agricultural Economics Research Review*, 23(conference number), 564.

- Prema, A., & Lisma, S. (2010). Home shops in Kerala—an innovative supply chain for micro enterprises. *Agricultural Economics Research Review*, 23 (conference number), 569.
- Ramanathan, G., Sundaravaradarajan, K. R., & Devi, K. S. (2010). Cashew value chain in India—a holistic approach. *Agricultural Economics Research Review*, 23(conference number), 550.
- Ramappa, K., & Manjunatha, A. (2016). Value chain analysis of tomato marketing systems in Karnataka. ADRTC, Institute for Social and Economic Change, Bangalore.
- Rao, B. D., Patil, J. V., Rajendraprasad, M. P., Reddy, K. N., Devid, K., Sriharsha, B., & Kachui, N. (2010). Impact of innovations in value chain on sorghum farmers. *Agricultural Economics Research Review*, 23(conference number), 419-426.
- Reddy, G., Murthy, M., & Meena, P. (2010). Value chains and retailing of fresh vegetables and fruits, Andhra Pradesh. *Agricultural Economics Research Review*, 23(conference number), 435-460.
- Rieple, A., & Singh, R. (2010). A value chain analysis of the organic cotton industry: the case of UK retailers and Indian suppliers. *Ecological Economics*, 69(11), 2292-2302.
- Roy, D., & Thorat, A. (2008). Success in high value horticultural export markets for the small farmers: the case of Mahagrapes in India. *World Development*, 36(10), 1874-1890.
- Rutherford, D. D., Burke, H. M., Cheung, K. K., & Field, S. H. (2016). Impact of an agricultural value chain project on smallholder farmers, households, and children in Liberia. *World Development*, 83(July), 70-83.
- Sharma, K. D., Pathania, M. S., & Lal, H. (2010). Value chain analysis and financial viability of agro-processing industries in Himachal Pradesh. *Agricultural Economics Research Review*, 23(conference number), 515-522.
- Sharma, N. (2016). Does contract farming improve farmers' income and efficiency? *Economic and Political Weekly*, 51(40), 63-69.
- Shrivastava, D.C., Singh, N.K., Bhandarkar, A.P., Bisen, N.K., Deshmukh, K.K., Chourasia, S.K., & Chand, P. (2010). Dairy value chain model in Seoni district of Madhya Pradesh: an innovative approach by SHG. *Agricultural Economics Research Review*, 23(conference number), 559.
- Sinha, R. K., & Kumar, R. (2010). Innovative technologies, institutions and policies for successful value chains for Tur farmers: a case study of NCDEX spot. *Agricultural Economics Research Review*, 23 (conference number), 426-436.
- Singh, S. R., & Datta, K. K. (2010). Understanding value addition in Indian dairy sector: some perspectives. *Agricultural Economics Research Review*, 23(conference number), 487-493.
- Staritz, C. (2012). Value chains for development: potentials and limitations of global value chain approaches in donor interventions. Working paper 31, Austrian Foundation for Development Research (ÖFSE). Available at: <https://www.econstor.eu/handle/10419/98802> accessed on 24 October 2017.
- Trebbin, A. (2014). Linking small farmers to modern retail through producer organizations—Experiences with producer companies in India. *Food policy*, 45, 35-44.
- UNCTAD. (2006). Promoting TNC-SME linkages to enhance the productive capacity of developing countries, firms: a policy perspective. Available at: http://unctad.org/en/docs/c3d75_en.pdf. Accessed on 22 August 2017
- Wani, M. H., Baba, S. H., & Nazir Junaif, N. H. (2010). Integration of vegetable production and marketing through value addition for food security in Kashmir Valley. *Agricultural Economics Research Review*, 23(conference number 18), 557.