LITERATURE REVIEW

2.1 Introduction

India's agricultural economy is undergoing through structural changes during the last three decades. Between 1970 and 2011, the GDP share of agriculture has fallen from 43 to 16 percent, aggregate reduction of 62.79%. As of 2011 India had a large and diverse agricultural sector contributing on average about 16% of GDP and 10% of export earnings. The agricultural land area of India is about 159.7 million hectares (394.6 million acres) is the second largest in the world after the United States. The gross irrigated crop area of India is about 82.6 million hectares (215.6 million acres) is the largest in the world. India has been among the top three global producers of a broad range of crops having the most importance for vegetables. According to a 2007 EU report Indian agriculture policy aimed to improve food self-sufficiency and alleviate hunger through food distribution during the period of 1990s and early 2000s. The government supported agriculture by not only investing in infrastructure but through minimum support prices for the major agricultural crops and farm input subsidies with preferential credit schemes. Under the price support policy minimum support prices are set annually to protect producers from sharp price falls and stabilize prices and ensure adequate food stocks for public distribution. The minimum support prices have been much below the actual market prices. Indian government has also promoted subsidies on many of the farm inputs. The unorganized government structure has led to inefficient use of these subsidies on farm inputs.

The Indian economy is basically an agrarian since economy since decades where the most dependence of society has been on agriculture. During the olden days agricultural produce was basically getting consumed by the way of barter system. Gradually the changing scenario with the changing times converted the concept and agriculture produce began being sold with commercial value. Instead of produce to produce exchange the concept of trading of agriculture produce began for exchange of money and from trading to marketing. For the Indian economy marketing is a much broader term than traditional trading and the concept of agricultural marketing is still evolving. In India an organized
network of cooperatives makes system by associating the different levels at local- regional- state and national levels assisting in agricultural produce marketing.

The commercial functions involving in transferring agricultural produce of farm and horticultural from producer to consumer is the agricultural marketing. Another dimension of agricultural marketing reflects the supply of produce from rural to rural and rural to urban and from rural to industrial consumers. The more number of intermediaries incur more costs and each transaction leads to high expenses and invites cost. Ultimately at the time it reaches to the producer the high cost of the produce and low price gives a negative gap to the farmer. In the entire process of marketing the producer gets the lowest price though the ultimate consumer pays the highest price as the involvement of more middlemen in the entire distribution process. There are numerous complexities involved in agricultural marketing as agricultural produce involves element of risk due to perishibility, seasonality and the type of produce, pricing of the produce but more than this the demand and supply mismatch. The interwoven mesh ultimately makes a deep impact on agricultural marketing.

Marketing and its core principle of 4Ps with the product, price, place and promotion is widely used for any product. In the case of Indian agricultural marketing system, it is not exactly the marketing in the exact sense and we can call it as distributive handling system and to go further it is distributive handling of agricultural produce. As there are number of intermediaries are involved in marketing of the agricultural produce differentiates it from real marketing of a product. However Indian economic scenario has changed drastically and tremendously with the impact of LPG. This has resulted in the changes in the distributive handling system and again has reinvented and evolved as agricultural marketing.

As per the definition by Webster’s dictionary “vertical coordination is the process of ensuring that each successive stage in the production, processing, and marketing of a product is appropriately managed and interrelated to the next, so that decisions about what to produce and how much to produce are communicated as efficiently as possible from the consumer to the producer”. Adam Kaufman (January 2006) defines that “The vegetable supply chain includes all the post-harvest packaging, storage, and transport methods used in delivering vegetables from the farmer through to final sale”. Vegetables studied here are
also called leafy greens, vegetable greens, greens, or salad greens are plant leaves eaten as a vegetable or sometimes accompanied with shoots and tender petioles. Though they belong to a wide variety of species of plants then too most of them share some common nature of innutrition and cooking methods other leaf vegetables.

2.2 Importance and Challenges with Vegetable Supply Chain Systems

The major structural changes in the world are taking place due to the efforts of agricultural industry to develop the agricultural sector in developing countries. The concept of agricultural production is changing from an industry controlled by family-based firms to organized and structured larger firms that are more accurately considering across all the dimensions of production to distribution of value chain in many developed countries (Boehlje, 2000). The trend of market-orientated reforms and multilateral trade liberalization with structural adjustment programs in developing countries has contributed for the increased integration of world markets (Reardon & Barrett, 2000). The observation of the research conducted by P. K. Suri and Sushil (2006) for agricultural development government rarely collaborates with its associative partners though the collaborations among companies are very common in the business world.

Reaching the end of the period of 11th five Years Plan (2007-2012), the support and available infrastructural facilities are in the process of expansion and very soon the 12th Five Years Plan (2012-2017) will come up and expecting some positive support to agriculture to work on the road map of the agricultural growth (Alam, G. and Verma, D,2007). Naresh Singla et al. (2011) says that to improve small producer’s livelihoods linking primary producers with global and national markets through fresh food retail chains is seen as one of the emerging agricultural marketing practices in India. Shawn Cole and Barrett Kirwan (2009) represent the attempt at exploring the determinants of participation in agricultural risk management by individual, temporal and regional components. S.H. Baba et al. (2010) have suggested that the coverage of technology mission should be expanded to other niche areas of vegetable cultivation. Kathryn A. Onken and John C. Bernard (2010) views that with the demand in local labeling programs such as the National Buy Fresh Buy local promotion appearing in increasing number of consumers and will be seeing many messages about local and fresh produced vegetables. The study has highlighted the needed effective measures to reduce the produce losses at various stages of
distribution. The demand for a well-developed vertical coordinated supply chain for food industry is discussed to satisfy increasingly diverse consumer preferences with the changing landscape faced by food supply chain participants by Robert, J. (2010). Giancarlo Moschini, Luisa Menapace and Daniel Pick (2008) discusses that the economics of geographical indications is assessed within a vertical product differentiation framework that is consistent with the competitive structure of agriculture. Mighell and Jones (1963) define vertical coordination as the linking of all the supply chain stages vertically for harmonization from production to marketing. The vertical coordination has been named differently with different definitions. As defined by Mighell and Jones (1963) vertical coordination is possible only with the full integration including open market to spot transactions through strategic alliances, joint ventures and contracting etc. This move is a private sector adaptation to a market environment that has changed due to a host of technological, regulatory and financial developments and in addition to changes in consumer preferences like quality, food safety, etc. The idea generated by Rachael E. Goodhue (2010) Contracting and other forms of vertical coordination are important parts of the supply chains for many agricultural produces.

Ramesh Chand has a great contribution academically to provide the solution for a varied range of problems in agriculture sector and throws light on the future of agriculture and expectation to the industry till 2020. To improve small producer’s livelihoods Rakesh Singh and H.P Singh (2009) has developed many models that suggest that the supportive way of this is to linking primary producers with global and national markets through fresh food retail chains which is seen as one of the emerging agricultural marketing practices in India too. The fresh food retail chains are investing from farm to fork to buy fruits and vegetables directly from farmers and sell them to retail buyers. However fresh food retail chains are found working with only large farmers and exclude small farmers for various reasons. Strategic interaction between public and private actors is increasingly recognized as an important determinant of agricultural market performance in Africa and elsewhere (Mangala, K.P. and Chengappa, P.G, 2008). Lars-Erik Gaddei (2004) concludes that the new conditions have affected the atmosphere in distribution channels encouraging more cooperative associations. The main reason for this change is the activity interdependences in the evolving networks have increasingly come to cross corporate boundaries and makes enhanced coordination necessary among firms Klaus Abbink et al. (2011). Berck and
Perloff found the gap that retail chain procure only a limited proportion of the grower’s crop without any firm commitment and more on every day basis. It has no authentic provision for any agri-input or other services and does not have any formal contract arrangements with the farmers. If the produce does not accepted by the RC get disposed of by the farmers elsewhere. Different articles provide different perspective on major innovations in research on agricultural markets over the past century. Michael G. Jacobides (2005) found that gains from intra firm specialization set off a process of intra organizational partitioning to simplify the coordination along parts of the produce supply chain. Barnett and Mahul reviewed the research on market structure and performance with vertical coordination arrangements and institutions for producer collective action has brought a good insight about contributions to empirical modeling of agricultural price determination. Marketing margins are also evaluated as innovations in research on spatial market relationships and the role of storage for vegetable produce in supply chain and marketing. Research conducted by Douglas E. Hughes et al. (2012) contributes that intention relating to the switch to market-based competencies are offered to shape new research opportunities in the field of the marketing and sales interface. Ganesh Iyer and J. Miguel Villas-Boas (2003) research on bargaining power of retailers concludes that an increase in the relative power of the retailer in the channel reduces double marginalization and encourages channel coordination. Balagtas and Holt’s discussion has contributed to the understanding of market information systems and the functioning of market-based mechanisms for agricultural risk management. Gulati says though it has been a remarkable journey in the progress over the decades the demand for stronger vertical coordination in the food system is being a means of satisfying increasingly diverse consumer preferences faced by food supply chain participants in the changing landscape. The consolidation trend in the marketing sector seems inevitable and implying that noncompetitive behavior and its effects will remain high point on the research agenda.

Nicholas Roberts and Varun Grover (2012) talks that Customer agility captures the extent to which a firm is able to sense and respond quickly to customer-based opportunities for innovation and competitive action. Investigating the benefits and distributional impacts of stronger vertical coordination through contracting and other means is also remaining a fertile area for the future. Joseph and Soundrarajan has provided the empirical price analysis research and concluded that it will face new data challenges in an environment
where fewer and fewer transactions are being conducted in open markets but this creates research opportunities as we seek answers to how different vertical coordination forms coexist and does it interact. The close attention to the time-series properties of commodity market gives the clear idea about the variables will continue to be important and irrespective of whether a structural or nonstructural modeling approach is being used. Study conducted by Birthal and Joshi shows the extent of investment made in promotion of marketing infrastructure in the country and find out whether private investment induces public investment or vice versa. The study by M S Jairath and Gaurav Jairath (2009) indicates that the private sector invests Rs. 1.20 on an average on each rupee invested by public sector. The analysis indicates that there is very strong relation between private and public investment. The study suggests to order to give further boost to investment in agricultural marketing infrastructure.

Table 2.1: Indian Vegetable Industry: Opportunities- Challenges and Strengths- Weaknesses

<table>
<thead>
<tr>
<th>Opportunities</th>
<th>Challenges</th>
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<tr>
<td>• Increasing demand due to increasing residents, income &amp; changing lifestyle towards healthy food</td>
<td>• Increasing focus in processing and retailing</td>
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<td>• Increasing demand for high value vegetables for modern markets in urban areas such as supermarkets (ready to eat vegetable packs and high quality, reasonably priced, reliable and consistent delivery at the right volume) and fast food outlets (processed and pre-cut vegetables)</td>
<td>• Requirements on quality standards, volume, traceability, reliability of delivery particularly from modern markets</td>
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<tr>
<td>• Higher price and increasing demand for organic vegetables off-season vegetable export window</td>
<td>• Decreasing production of vegetables</td>
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<tr>
<td><strong>Strengths</strong></td>
<td><strong>Weaknesses</strong></td>
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<tr>
<td>• High yield capacity</td>
<td>• Unstable/fluctuating prices</td>
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<tr>
<td>• On-going private sector initiatives</td>
<td>• Majority of the farmers/traders supply to conventional markets with pricing based on spot markets (unlike modern markets where prices can be negotiated and more stable)</td>
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<tr>
<td>On-going private-public sector initiatives</td>
<td>• Lack of information on variety and volume</td>
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resulting in overproduction and underproduction
- Gap on information particularly on: marketing –consumption, quantity and quality requirements needed by the market
- Production and real time statistics on volume & soil/area suitability maps
- Lacking in infrastructure facilities
- Farm to market roads
- Additional trading post
- Irrigation facilities
- High transportation cost
- Lack of organization (clustering and strengthening of producer organizations)
- Inadequate technology on processing of vegetables
- Regulatory issues
- certification of organic vegetables
- protection of farmers from buying inferior quality seeds
- Inadequate access to vegetable insurance schemes(risk management)
- Inefficiency in the supply chain due to several layers of players
- Need for Research and Development to reduce mismatch of demand and supply
- High losses post production
- High input costs like credit, packaging and seeds etc.
- insufficient extension services lack of personnel in extension and some extension officers are not capable

<table>
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<th>2.3 Studies on Driving Factors to Change the Vegetable Supply Chain System</th>
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<tr>
<td>This section of the study describes why the form vegetable supply chain is changing? What are reasons for such changes? The mostly emphasized forces of change are globalization and reform in agricultural market globally followed by industrialization in</td>
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agricultural sector. All these three forces are basically paving the way for the development of the sector by a greater coordination in the agro-food supply chain systems.

2.3.1 Agro-industrialization

When we talk about the agricultural industrialization, it is different for developing countries and developed countries. It is governed by different set of constraints and forces in developing countries and developed countries. The diversity of institutional arrangements is the result and visible due to the difference of developing countries and developed countries. On a very basic format of response the industrialization of agriculture is transforming as contracting arrangements by Singh, S. (2013). They are increasingly coordinating with modern agricultural supply chains to develop new models. Though the factual form of the supply chain structure is not same everywhere rather varying depending upon the situational variables.

The significant structural changes in the food system describe the concept of agricultural industrialization by Singh, U. S., Mishra, U.S. and Mishra, B.B. (2014). The agricultural transformation has been a process all around the world due to the diversity in the nature. The consolidation in different stages of the food system is increasing through contracting, integration and vertical coordination. The linkages for larger scale of production through formal or informal arrangements are developing including processors, intermediaries and retailers (Boehlje & Doering, 2000). There has been a two way classification for the whole range of changes, since both are different (Drabenstott, 1995), one is the shift from food commodities to food products and other is the shift from spot markets to channelized market by Singh, U. S. and Mishra, U.S. (2015).

Boehlje (2000) states that the agriculture sector is taking most dramatic changes in terms of changes in the fundamental proposition of business and the process of doing the business. He argues on the implementation of biological manufacturing, development of differentiated products and the structure of food supply chains. The agricultural development in both developed and developing countries is due to the increased industrialized nature of agriculture using biological and information technologies (Schrader, 1986). The different variables of development are economic growth, increasing scale of organization and the modernization of production, mechanization, processing and distribution systems (Sofranco et al., 2000). Drabenstott (1995: 14) argues that a new
consumer and a new producer are two powerful forces driving the process of industrialization. In one hand the demand created by new consumers are highly competitive and in other hand new producers are well equipped with latest technology and management skills. The changing lifestyles, shifting demographics, different eating patterns has a high impact on the link between diet and health. The consumer behavior is heavily influenced by the need of food safety and the food scarcity. A large number of niche markets are developing by replacing the mass food markets to cater the very specific needs of consumers. As a result separate niche markets are getting developed by food companies to serve customized products (Boehlje, 2000; Drabenstott, 1995; Davis & Langham, 1995).

Due to the increasing urbanization, this argument is applied in both developing countries and developed countries. Present-day quality is not only the demand of consumers. Much more than quality they also want choice, consistency and value, therefore the shift in agriculture is taking place by Singh, U. S. and Mishra, U.S. (2013). The philosophy is changing to the situation where farmers are producing what the consumers want though earlier was what we produce consumers have to get. New technology with information network has enabled the market structure to move as per consumers demand by ensuring the demanded characteristics (Drabenstott, 1995; Boehlje, 2000).

Industrialization has always accelerated the growth and has created plenty opportunities for small farm holders. In developing countries contract according to certain specifics to produce horticultural commodities has strengthen the horticulture sector (Kandiwa, 1999). Other way it is a danger to small farmers of being marginalized and can get excluded from high-value markets (Reardon & Barrett, 2000). There is a strong need to develop a model that can develop a link for small farmers with the high-value markets. We need to understand that does the arrangement such as contract farming provide the solution to the challenge with small farmers. As suggested by Bonnen & Schweikhardt (1998) contracting and different modified to suit country-specific conditions can be used as a vehicle to overcome transaction cost barriers. The challenge is there in this model can lead to a danger that if the relationships are not well managed large agribusiness firms with monopolistic business could result in the total marginalization of many farming communities.
2.3.2 Globalization and Vegetable Industry

Multinational companies are responsible for the exploration of opportunities in globalized economy. The structure of agri marketing systems in the European Union (EU) and the United States (US) has altered due to high concentration of retailers and food processors. The horizontal development and the vertical development are the further step move in the broad development of the agri food systems (Sheldon and McCorriston, 2003). Reardon and Berdegue (2002) show the development in vertically integrated market from traditional marketing by contractual arrangements between buyers and small producers due to the high concentration of food processors and retailers in the fresh fruit and vegetable sector. Increasing competition in global market, economies of scale, scope in production with distribution and risk mitigation with management strategies of suppliers and buyers are the other major drivers of change in agricultural sector.

Individual businesses are improving the productivity by increasing the level of processing using new technology for positioning and to control the market with huge range of products (Von Braun & Kennedy, 1994; Royer, 1995). The increased supply due to competition has made the food business very unpredictable (Huffman & Just, 1994; Meliczek, 2000). All these happenings are the result of competition to optimize the efficiency with minimizing transaction costs (Schrader, 1986; Frank & Henderson, 1992; Rhodes, 1993). In order to produce a high quality differentiated products (Babb, 1992; Sporleder, 1992; Royer, 1995; Peterson & Wysocki, 1998; Pasour, 1998) agriculture is seen as getting away from open market production and has become increasingly vertically coordinated.

The development as the shift from traditional markets to the coordinated markets can also lead to the loss of traditional agricultural markets. The process flows of bulk commodities moves through commodity markets to food processors getting market standardized before reaching to consumers. The specific farm products or customized products and foods are getting delivered to consumers assuring the quality. Since horticulture is a fresh product, so food safety is being the main concern and resulting traditional spot markets are getting avoided by processors and marketers and getting engaged in more direct market channels such as market and production contracts full ownership or vertical integration. The global liberalization and domestic market reforms
are impacting the small producers all around the world. The participation of small scale producers has been difficult in new market opportunities due to efforts of liberalization the harmonization of standards and the encouragement of foreign direct investment (Stanton, 2000). The competitive buyers, limited access to capital and technical assistance are the typical problems. Agricultural exports have boosted domestic market reforms in developing countries in general and provided opportunities for global and regional companies. The significant changes in the organization of the agri-food system led by rapid increase in multinational firms in the agri-food sectors has also led to increased concentration in the downstream enterprises in the agri-food chain by Singh, U. S. and Mishra, U.S. (2013) and Singh, U. S., Mishra, U.S. and Mishra, B.B. (2014).

2.3.3 Changes in Technology

The agri-food systems have got much affected due to the advancement and rapid technological developments. The whole supply chain network of vegetables has been affected and the result of cultivating vegetables has been changed. The increase in yield of vegetables and the price reduction (Saxowsky and Duncan, 1998) are the outcome of implementation of new technologies. Farmers are driving towards the differentiation creation among produces and to increase the process of value addition to vegetables through technological processes (Reardon and Barrett, 2000). The development in information system also has coordinated and managed by supporting in decision making and establishing relationship among farmers in the businesses of large processors and retailers in other countries (Saxowsky and Duncan, 1998) beyond the physical distances. The competition is increasing among producers and they are working on technological improvements, as this has been the core to compete and to grab the opportunity but at the same time this is a threat to them who are unable to adapt this change. According to Reardon and Barrett, (2000) technological changes related to biotechnology, global positioning systems, improvements in transportation and information systems is increasing global competition in agri-food systems, but at the same time enhancing the productivity and contributing to lower transaction costs.

2.3.4 Trade Liberalization and Policies

The globalization and competition to expand the business as multinational has a huge impact on trade in global agri-food systems (Reardon and Barrett, 2000). As well it
has supported the need of trade liberalization agreements. The agreements are getting executed through many agreements accepted worldwide like the General Agreement of Trade and Tariffs (GATT), the World Trade Organization (WTO), and the North American Free Trade Agreement (NAFTA). The International Monetary Fund (IMF) and World Bank are the two financial organizations responsible for the programs of structural adjustment. All the major policies are governed by these organizations and encourages for many changes and development in agricultural sector like monetary policies, issues related to tariff and non-tariff barriers, foreign direct investment participation and level of government involvement. According to the study (Abbot et al., 2002; Reardon and Barrett, 2000) the changes are necessary for development. It must get observed time to time with evaluation and needs to take all the steps to facilitate the integration of goods and capital markets around the world. It is much important for the agricultural sector and vegetable supply chain due to the increasing demand of varied range of produces by the global consumers. Now the whole world is seeking the dish of others on their tables. So the global trade policies must get liberal and reform as per the need of environment.

2.3.5 Consumer Demands and Environmental Concerns

Increasing consumer demands with dynamic changes has been a major concern of current food market. Due to the increases in income consumers are shifting from staple foods to non-staples. The urbanization has led to change in cooking habits due to lack of time. Many situations like demand for more quality, food safety and a list of other characteristics (Reardon and Barrett, 2000) are driving consumers to look for convenience during the shopping for vegetables. The rise of supermarkets is the parallel to the changing trend in agricultural produce marketing. This process has impacted the traditional production and marketing systems (Reardon and Berdegue, 2002). After all these developments some consumers may still prefer small stores reasoning the guarantee with more personal and traditional relationships (Estrada, 2004; Schwentesius and Gomez, 2002). The economic and innovation power with more capacity of supermarkets and malls are putting high pressure on Small businesses in trying to capture this market segment.

Grades and standards (G&S) have been a major concern for present day consumers. The increasing demands are not alone but including food safety issues and sees as the reflection through certification labels. It is an advantage for the agribusiness firms
(Reardon et al. 2001; Nadvi and Waltring, 2004) on consumer demands that give the scope of differentiation of products but simultaneously the new requirements of fresh vegetables are posing additional pressure. The proactiveness of consumers for environmental issues has taken it as the most important concern and has been more sensitive for their surroundings. To response the demand with high yield of produce has forced the farm sector for heavy use of agrochemical products like fertilizers and pesticides. This has generated a high risk for human health conditions and also causing environmental degradation (Pinstrup-Andersen, 2002). The cultivation of safe and low price vegetables under environment-friendly conditions (Pinstrup-Andersen, 2002) with establishing a viable business proposition is the biggest challenge for current business model of agri-food systems. The newer technology and well-trained labors with management skills can show a roadmap to overcome this challenge. The development in social awareness has opened a new door for production of organic vegetables. The cultivation of organic vegetables is an opportunity to get the niche market for farmers that can contribute a good profit to the vegetable sector. Vegetable certification process is at very nascent stage and is another challenge for farmers (Hellin and Higman, 2003). In the case of Odisha consumers are also not much aware about the standards and certifications. It is needed to create awareness among consumers to make them particular about this for vegetables. Quality characteristics and price of vegetables are still the major concerns for vegetables. The lack in standard measures in agricultural sector has been almost same all around the world.

2.4 Shifts from Traditional Agriculture to Technical Agriculture

Earlier the concept of agriculture viewed as traditional agriculture associated with production of vegetables by the farmers in their farms and was getting sold in the spot markets the new mode of agriculture is called the technical agriculture where the different produces are cultivated based on the contractual agreement. Traditional agriculture was in the flow of firstly then marketing but the technical agriculture is based on marketing first and production is based on known demand. Markets have also changed and mostly are products driven with its variety. Information is the most powerful tool to control the market dynamics (Boehlje, 1996; Fulton, 2001; Young and Hobbs, 2002) and the factors of production since its being more capital intensive and needs to be more mutual dependent. Farmers are focused on production of vegetables on the uttermost consideration and not
much thought for the risk actors (Fairbairn, 2003, p. 14) in traditional agriculture but farmers are more enterprising in nature, organized and mutually supportive, more over having high capacity to access information the technical agriculture. The observation says that they need to change their mentality of produce and then sell and rethink in order to produce the fill the consumer’s demand (Boehije, 1996; Fairbairn, 2003). The new activities contributing to development of sector and economy must get in account by farmers. To shape the structure of the sector, dimensions like knowledge, information, networks, alliances, outsourcing, contracts, consumer choices, niches and preferences (Fairbairn, 2003) should get shaped first. In the global economy the capacity building of small farmers are the serious concerns for the adjustments of profound changes in agricultural produce supply chain systems (Reardon and Barrett, 2000; Berdegue, 2001).

Table 2.2: From Traditional Agriculture to Technical Agriculture

<table>
<thead>
<tr>
<th>Traditional Agriculture</th>
<th>Technical Agriculture</th>
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<tbody>
<tr>
<td>• The priority is for produce which is getting dealt at spot markets</td>
<td>• The priority is for differentiated products which is getting dealt with negotiations and bounded with contracts</td>
</tr>
<tr>
<td>• Most of the activities carried out by farms</td>
<td>• Most of the activities are done at firm at production stages</td>
</tr>
<tr>
<td>• The supply of produce is through product chain where stages are independent</td>
<td>• The supply of produce is through system where stages are interdependent</td>
</tr>
<tr>
<td>• Major risk factors are price and production</td>
<td>• Major risk factors are relationship, food, health and safety</td>
</tr>
<tr>
<td>• Monopoly pricing is the main concern</td>
<td>• Access to information is the main concern</td>
</tr>
<tr>
<td>• Sources to control are money and assets</td>
<td>• Source to control is information</td>
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The concept of vertical coordination has been adopted when shifting towards technical agriculture in developing countries. Reardon and Barrett (2000, p. 195) states there has been linkages among the foreign suppliers worldwide to serve the customer and get a high profitability in integrated global economy causes established agribusiness firms in developed countries. The restructuring of agriculture is the global phenomena in
It is in the manifesto that describes the rise of contract farming. Reardon and Barrett (2000) believe the spot market arrangement has been affected by contractual management. According to Messner (2004) framework of world economic triangle attempts the measuring of the level of interplay between local and global contexts and assess the contribution that can make to local development. As per the explanation of this framework global market controls all regions with a tie and demand placed by local actors o their capabilities are significantly getting influenced by all the players. Global value chains are at the top priority linking all local businesses to global buyers. The production for international buyers firms are showing more interest instead of producing for anonymous buyers as traditional markets.

**Source:** Messner, 2004.

**Fig. 2.1: The World Economic Triangle**

Vertically coordinated vegetable supply chain is an example of the relationship between big retailers and small farmers in Africa and Latin America (Dolan and
Humphrey, 2000; Reardon and Berdegué, 2002). The access to the market for local producers and the support to upgrade their capabilities with new production methods are the repercussions of the economic development in the globalized economy (Messner, 2004). International standards must get followed by local producers to participate in global value chains. In the process of shaping the global value chain governance (Messner, 2004), a set of international public and private institutions are actively participating. What, how, how much, and when to be produced are the major concerns of governance by Humphrey and Schmitz (2004, p 97). It is an institutional mechanism to develop the inter-firm relationships and to achieve nonmarket or explicit coordination. The local producer participation at a very low level in setting international standards and searching institutions to contribute in the governance system of global value chain big concern (Nadvi and Waltring, 2004). Vertically coordinated supply chain supports two ways, by one hand for farmers it offers the opportunity to produce the demanded products in the market and provides the linkage to sell their products on more than the minimum support price to the processors and retailers (Saxowsky and Duncan, 1998) and by other hand supports processors and retailers in getting the customized produces with a good quality, quantity and price. As farmers move downstream within the supply chain (Hobbs et al., 2000) so huge share of prices paid by the final consumers can get accounted for farmers but the constraints of outdated production and marketing systems (Hellin and Higman, 2003) impose challenges farmers.

2.5 Types of Vertical Coordination in Agriculture

Agriculture was always an integrated system from the very beginning because of most of the resources and decisions are in under the control of single hand (Penn 1958). The complete process is in the hand of a family including seed collection, sowing and reaping the vegetables. Agriculture as a production industry is closely related to marketing activities which transforms transport and transfer food and fiber to the consumer. Additionally agriculture is served by a large number of industries which are supplying farm inputs. Coordination and/or integration between farms and the other firms in the industry both forward and backward are being inevitable now. The changes in market structure (born of supermarket revaluation) and the upsurge of high technology in farming (Barker 1972) are main reasons of this reversal. Vertical coordination refers to the synchronization
of successive stages of production and marketing, with respect to quantity, quality, and timing of product flows. Methods of vertical coordination include open production (also referred to as open or spot market), vertical integration and contract production. Reasons of vertical integration among agriculture, industry and commerce sectors are basically: (1) Complication of organization of production and consumption, (2) Small production scale, some features of agricultural products such as being storage able and spoilable, (3) Different growth possibilities of the agricultural sector from other sectors, (4) Efforts of increase market shares of agricultural industry and industry based on agriculture.

Source: Peterson et al. (2001)

**Fig.2.2: The Vertical Coordination Continuum**

**NOTE:** The diagonal line represents the mix of invisible-hand and managed coordination characteristics found in each of the five alternative strategies for vertical coordination. The area above the diagonal indicates the relative level of invisible-hand characteristics and the area below the diagonal indicates the relative level of managed characteristics.

There are three basic kinds of integration. **Vertical integration** occurs when a firm combines activities unlike those it currently performs which are related to them in the sequence of marketing and production activities. Such integration could be illustrated by the meatpacker who decides to reach both backward toward the producer and operate his own livestock buying points in the countryside and forward toward the consumer and operate his own meat wholesaling firm. **Horizontal integration** occurs when a firm gains control over the firms performing similar activities at the same level in the production and marketing chain. The local dairy cooperatives which are brought under a regional union are the example. Vertical integration is best reserved for ownership integration where two or
more stages in the process of production and marketing are effectively controlled by a single management. This term is related to a technological rather than an institutional development (Trifon 1959). Firms often expand both vertically and horizontally. If both vertical and horizontal operations are tied together then it is called circular integration. When there is organization of dairy farmers under a dairy cooperative a vertical integration has appeared at the same time if dairy cooperatives are organized under a regional cooperative union a horizontal integration has occurred. There is another type of organizational expansion which occurs when agencies or activities that do not have any direct relations among them are brought under a unified management. It is called conglomeration.

Another way to review integration in one industry is by studying the extent of the transfer of decisions and the ownership of the firm assets. When all the decisions and assets of the firms are taken under a single firm control that ownership is called ownership integration or merger. In contrast when each firm retains its separate identity but leaves one or more decisions of production and/or marketing to the control of another firm that is called quasi integration or contract integration.

On the other hand the terms vertical coordination, vertical integration and contract production are often used interchangeably (Cramer and Jensen 1988; Paarlberg 1995). Of course vertical coordination is a rather broad term which encompasses all means of harmonizing vertically interdependent production and marketing activities ranging from spot markets through various types of contracts to complete integration (Frank and Henderson 1992). In agriculture four types of vertical coordination between farmers and off-farm businesses are generally recognized.

1. Coordination without Any Contract: This is named a spot market or open market transaction. In this relationship there is no written or oral contract between the firm and the farmer for both buying and selling. In this type of coordination the farmer buys supplies from whom he chooses and sells his products to whoever will give the best price. This type of integration does provide freedom to farmers but uncertainties both in buying supplies and selling produce are the main drawback.

2. Contract Farming: Contract farming is sometimes called quasi integration. British and American approaches are different in this subject. The British view has drawn a sharp
distinction between contract farming and vertical integration and they see one as an alternative of the other (Barker 1972). They prefer to confine the meaning of vertical integration to called ownership integration. American practice in particular has been to regard contract farming as a form of vertical integration (Allen 1972).

3. Ownership Integration: In this type of integration each individual farm loses its identity and becomes a company-owned farm. The company owns or leases the all the assets and has its own employees.

4. Farmer Cooperatives: An agricultural cooperative is an organization usually incorporated, owned and controlled by agricultural producers operating for the mutual benefit of its members as producers or patrons (Rehber 1984). One worldwide way of vertical coordination is of course cooperative organizations.

2.6 Summary

The literature reviewed and discussed in this chapter constitutes the background to justify the need of this study and the different dimensions studied to reach the research problem. As the introduction constitutes of economy and different perspectives of agriculture further discusses about the India's agricultural economy is undergoing through structural changes during the last three decades. Between 1970 and 2011, the GDP share of agriculture has fallen from 43 to 16 percent, aggregate reduction of 62.79%. As of 2011 India had a large and diverse agricultural sector contributing on average about 16% of GDP and 10% of export earnings. The next phase has explored the importance of commercial functions involving in transferring agricultural produce of farm and horticultural from producer to consumer is the agricultural marketing. Another dimension of agricultural marketing reflects the supply of produce from rural to rural and rural to urban and from rural to industrial consumers. The more number of intermediaries incur more costs and each transaction leads to high expenses and invites cost. The major structural changes in the world are taking place due to the efforts of agricultural industry to develop the agricultural sector in developing countries. The concept of agricultural production is changing from an industry controlled by family-based firms to organized and structured larger firms that are more accurately considering across all the dimensions of production to distribution of value chain in many developed countries. Investigating the benefits and
distributional impacts of stronger vertical coordination through contracting and other means is also remaining a fertile area for the future. It has well presented the scenario of Indian vegetable industry involving opportunities-challenges and strengths-weeknesses.

The other sections describe the different driving factors to change the vegetable supply chain system and why the form vegetable supply chain is changing? What are reasons for such changes? The mostly emphasized forces of change are globalization and reform in agricultural market globally followed by industrialization in agricultural sector. The major drivers of change are agro-industrialization, globalization, vegetable industry changes in technology, trade liberalization and policies and consumer demands with environmental concerns. Why there is shift from traditional agriculture to technical agriculture can be assessed with respect to the global value chain governance coordinating large buyers and local producers. Vertical coordination continuum has been the way to coordinate including contracts, alliances and joint ventures. Vertically coordinated vegetable supply chain is a concept and is an example of the relationship between big retailers and small farmers. The different types of vertical coordination approaches in agriculture are vertical integration, horizontal integration and circular integration have discussed in detail. Lastly ended with explaining the reasons of vertical integration among agriculture, industry and commerce sectors are basically complication of organization of production and consumption, small production scale, some features of agricultural products such as being storage able and spoilable, different growth possibilities of the agricultural sector from other sectors, efforts of increase market shares of agricultural industry and industry based on agriculture. Though changes may be beneficial to farmers when seen as opportunities but also bring challenges for adjustment with the market. There is a demand of institutional innovations to access contemporary supply chains through new marketing arrangements. After all vertical coordination in supply chain of vegetable industry can be a solution to a robust supply chain for vegetable industry.
Reference


