

## **Chapter 3 - Literature review**

Contract farming has been the area of academic interest in the western world since 1950's (Roy, 1963; USDA, 1963). While studies on contract farming in third world started to appear in late 1960's (De Treville, 1986). Studies on contract farming in India date back to late 1990's after the start of Pepsico (I)'s tomato contract farming scheme in Punjab. The subject of contract farming has been dealt by the researchers across the various disciplines viz. economics, sociology, anthropology, law, management, etc. In this chapter, the review of the earlier works (both in India and around world) in light of the research questions (section 1.4) are discussed.

The sources of review literature are academic journals, books, conference proceedings, Government publications, selected company's annual reports, periodicals, newspapers, etc. An attempt has been made to carry out the extensive review dating from the 1960s till 2015.

### **3.1. Farmer inclusiveness aspects of CF**

Farmer inclusiveness refers to when farmers are integrated into the whole value chain or are a part of the value chain whereby there is an exchange of information between consumers, retailers, processors and farmers (Vis, 2012). According to Rosenberg (2012), inclusiveness from business firm perspective is the understanding of the fact that by improving smallholders' business, firms improve their business. It is about recognising that by supporting farmer to produce more and better raw materials and by improving their incomes; firms become their preferred buyers which in turn make them reliable suppliers for firms' business chain. Lundy (2012) remarked "about the need to be realistic about who can be included and who cannot be included in this value chain! In some cases it is feasible to include small farmers in the value chain while in other cases it is not". In this section, the past work on when, where and in which kind of crops, small farmers, and large farmers<sup>11</sup> are preferred is discussed. Also, what are the factors behind the inclusion or exclusion of small farmers in the value chain?

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<sup>11</sup> There is no universally accepted definition of small and large farmers. The term is commonly based on to the size of the landholding or livestock owned (Narayanan & Gulati, 2002). For the purpose of this review, small farmers are, who have limited resource base for e.g., in India farmers owning less than two hectares are considered as small farmer, whereas large farmers are considered who have larger land holding and better resource base compared to small farmers

### 3.1.1. Small versus large farmer debate

Most of the literature related to inclusiveness aspects of CF looks into whether small farmers are excluded from CF or not. Literature so far has seemed to provide the mixed results. Some of the Indian studies such as Birthal, Joshi, and Gulati (2005) on dairy, vegetables, and poultry; Erappa (2008) for gherkin in Karnataka; Nagaraj et al. (2008) for baby corn, chillies in Karnataka; as well as many studies conducted in other countries, viz. Warning and Key (2002) for peanuts in Senegal, Simmons et al. (2005) for broiler in Indonesia, Ruben and Saenz (2008) for pepper in Costa Rica; and Wang et al. (2009) for horticulture crops in China, have observed that CFAs favoured small farmers. However, in case of palm fruit in AP (Dev & Rao, 2005); tomatoes in Punjab (Rangi & Sidhu, 2000, Singh, 2002) and Haryana (Dileep, Grover & Rai, 2002); for multiple crops in Punjab (Kumar, 2006; Singh M. P., 2007; Singh, 2009); for multiple crops in Odisha (Regional Centre for Development Cooperation, 2011); seed farming in Indonesia (Simmons et al., 2005) and AP (Swain, 2011), mango and bean crops in Senegal (Dedehouanou, Swinnen, & Maertens, 2013), several crops in Madagascar (Bellemare, 2012) and United States (US) (MacDonald & Korb, 2006) found that landholding size was positively associated with contract farming participation<sup>12</sup>.

Most of the studies mentioned above in India have used the proportion of farmers about landholding size among total sample farmers, as the indicator of inclusiveness of the contract farming scheme. While some of the farmer participation studies, for e.g., for India Birthal et al. (2008), Narayanan (2011), Ramaswami et al. (2006), Pandit, Lal, and Rana, 2014; Swain (2012); while for outside India viz. Bellemare (2012), Hernández (2009), Miyata, Minot, and Hu (2009), Simmons et al. (2005), Warning and Key (2002) has involved modelling the probability of a farmer's contracting based on a set of explanatory variables such as land size and socio-economic variables

Birthal et al. (2008) found that probability of dairy producers participating in contract farming in India was significantly higher for the large farmers. Similarly, Pandit et al. (2014) for potato in West Bengal, Swain (2012) for gherkin and seed rice in AP; Cai, Ung, Setboonsarng, and Leung (2008) in case of rice in Cambodia; Maertens and Swinnen (2009); Miyata et al. (2009) for green onion in China; Awotide, Fashogbon, and Awoyemi (2015) for rice in Nigeria found large farmers had higher probability to grow

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<sup>12</sup> The list of studies highlighting farmers' participation is not complete.

crop under contract. In contrast, Narayanan (2011) for papaya in TN and Miyata et al. (2009) for apple in China found, small farmers had a higher probability to grow under contract compared to larger farmers. Similarly, Ramaswami et al. (2006) and Simmons et al. (2005) observed that experienced and large broiler farmers<sup>13</sup> have a higher probability of not participating in contracting. Moreover, Ramaswami et al. observed 36% of contract broiler producers had poultry as the main occupation compared to 72% of non-contract broiler producers. Thus, those farmers, who did not have poultry as a primary occupation were more likely to grow broilers under contract. Simmons et al. (2005) found participation in the broiler contract in Indonesia was negatively influenced by ownership of irrigated land and positively influenced by the credit constraint status of a farmer, indicating that the contract may be more attractive to smaller farmers who have limited potential for crop production. One of the reasons, for preference of contract for small poultry growers, is that the growing broilers require high investment upfront. Thus, farmers wanted to reduce the price and market risks by growing broilers under contract.

When trying to answer the question, whether agribusiness firms exclude marginal and small farmers? It is important to understand to understand, who selects whom. Is it the firm which selects farmers or is it a farmer who decides whether to grow the crop with contracting firm. Narayanan (2011) mentioning about the paucity of data in this regard writes that many studies often refer to a static, binary notion of participation in CF, i.e., whether the farmer is CF or NCF<sup>14</sup>. It is rare that studies highlight whether it is the firm who strategically chooses the farmers or is it farmer who self-selects to be in the contract or whether it is both (p. 159). However, some of the studies have reflected upon these aspects. Narayanan further notes that firm's selection of which farmers to contract with depends on their perceptions of the alternatives. Thus if the number of farmers is more than what the firm requires, it may choose to select the farmers. If its requirement is more or it would be more costly to go to a new location, then the firm would welcome all the farmers who are capable of growing the crop in the particular region.

Farmers on their own coming forward and contacting the firm for growing crop under contract was observed in the case of basmati paddy in Punjab by Singh and Asokan (2005). Similarly, in the case of broilers producers in Indonesia, there was the

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<sup>13</sup> Broiler growers are classified small or large farmers, according to the flock size they maintain. For e.g., less than or equal to 5000 birds (small farm), farms with 5001-10000 birds (medium farm), and farms with more than 10000 birds (large farm) (Kalamkar, 2011a).

<sup>14</sup> Farmer cultivating the crop without any contract.

occurrence of self-selection by farmers', i.e., small farmers having credit constraints<sup>15</sup> approaching the company itself (Simmons et al., 2005). Miyata et al. (2009, p. 1787) also observed some self-selection in becoming a contract farmer, but it regards labour availability and location rather than land size that influenced the decision to grow under contract. Therefore, the anecdotal literature suggests that many times, it is the farmer who decides whether to grow the particular crop with the firm under contract or not. The further question that arises are about what are the factors that induce the farmer to grow the crop under contract? The review about the factors influencing farmers to join contract farming is discussed in the section 3.1.3.

### **3.1.2. Spatial dimension**

Another dimension to be considered is the geographical and agro-climatic factors. As the choice of contracting partner shall also depend on the nature of commodity and local conditions (Minot, 2007; Simmons et al., 2005). Contracting firms' choice of regions (villages) from where it would source the produce depends on agro-climatic suitability, proximity to the processing plant, availability of irrigation facilities, etc. (Section 2.5.1). For instance, rubber cultivation is carried out in some districts of Kerala, apples in Himachal Pradesh, and Jammu and Kashmir. Narayanan (2011) observed contracting firm sourced marigold from the mid-elevation regions in the northern part of the TN, where cooler temperatures are conducive to higher yields. In the case of broiler in TN, firm choose those village which are large, but sparsely populated villages, and where cultivation is not on a large scale. As this would help in better availability of family labour for broiler production.

The average farm holding size in the state of Punjab and Haryana is 3.77 and 2.25 hectares respectively compared to 0.22 and 0.77 hectares in Kerala and West Bengal respectively (GoI, 2010-11). Thus, there is more likelihood of medium and large farmers participating under contract in Punjab. While in states like Kerala and West Bengal, there is the likelihood of large participation of small farmers in contracting. Narayanan (2011, pp. 20-21) also mentions in her literature review citing Miyata et al. (2009), Ramaswami et al. (2006) and (Warning & Key, 2002) that supermarket and contracting firms would source their produce from smallholders if the region is dominated by them.

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<sup>15</sup> Credit constraint refer to that farming household have an excess demand for credit (Guiringer & Boucher, 2008)

Stringer et al. (2009) in their study of vegetable processors in China observed that processors preferred to have large producers and also those villages that were nearer to the processing plant. The reason being to economise on transaction costs (negotiation costs and supervision costs) in dealing with farmers to keep unit costs low. Therefore, agro-climatic and geographical conditions are an important factor in determining the selection of regions for contract farming. Often crops grown under contract farming are those which are used in agro-processing. For e.g., chip-grade potatoes for wafer manufacturing, sugarcane for the production of sugar, cotton for textiles, etc. this means that there is a derived demand for these crops. i.e., demand for these crops depends on the finished products. As long as there is demand for the finished product, the firm will continue to produce it and keep sourcing the agro-commodities for the same.

### **3.1.3. Determinants of farmers' participation in contract farming**

Beyond the small-large farmer debate, the other key determinants viz. socioeconomic characteristics that influence farmers' participation is discussed.

#### **3.1.3.1. Social group and household Characteristics**

In this sub-section, the social group and demographic characteristics of the household are reviewed. One of the important things in India is to review whether marginalised social group or the backward groups are excluded from contract farming. After the regions are selected for contract farming. The composition of the farmers as per social group depends on the actual situation. As in some villages majority (for e.g., more than 70%) would belong to Other Backward Class (OBC) caste category. Then, in that case, it is likely that majority of CF would also belong to OBC. Similarly, if the majority of the farmers within a village belong to general category, then it is likely that majority of farmers participating in contract farming would also belong to general category.

Literature review indicated that there have not been any biased approach towards backward castes by contracting firms. Swain (2012) in his study of AP found that upper castes were less likely to be in contract farming of gherkin and paddy seed. A study by Regional Centre for Development Cooperation (2011) comprising of 505 sample from seven districts in Odisha found only 15% of total farmers belonging to a general caste, while rest is belonging to the backward caste of which 50% belong to Scheduled Tribe (ST). Narayanan (2011) observed that higher likelihood of marginalised social groups participating in marigold and papaya contract farming (p. 197). Kalamkar (2011) did not

found any caste biases in a sense any differences in caste distribution among contract and non-contract broiler growers in Maharashtra.

Randel (2005) points out that younger farmers are progressive and are likely to be receptive to new ideas. In contract farming literature, the influence of age variable on contract participation has been found out heterogeneous. Birthal et al. (2008) for milk producers in Rajasthan, Nagaraj et al. (2008) for baby corn in Karnataka, Awaited et al. (2015) for rice in Nigeria founded as age to positively associated with contract farming participation. In contrast, Narayanan (2011) for cotton in TN, Swain (2012) for gherkin in AP, Cai et al. (2008) for rice in Cambodia, Ruben and Saenz (2008), and Simmons et al. (2005) for seed rice and broilers in Indonesia found households with younger household heads were more likely to join the contract. There are also studies viz., Narayanan (2011) for papaya, marigold, gherkin and broilers in TN, Swain (2012) for rice seed, Miyata et al. (2009) for green onion and apple in China, and Warning and Key (2002) for peanuts in Senegal, did not found significant age differences across contract and NCF

Farm experience (i.e., number of years in farming) is another variable, which would be correlated with the age variable. Birthal et al. (2008) for dairy producers in India found the experience to be significantly and positively associated with the probability of contract participation. In contrast, Simmons et al. found experienced farmers do not need the support of the company and were ready to grow broilers on their own without a contract. Ruben and Saenz (2008) observed that experienced choyate farmers in Costa Rica were more aware of spot market conditions and are likely to get a good deal in it. Whereas less experienced farmers prefer to grow choyate in contracts, as it provides a certain level of security against market and price uncertainties. Thus, we can infer contract farming helps inexperienced farmers adopting new crops and technology

Household size is another variable that seems to influence the farmers' participation in contract farming. Household size is a rough measure of labour availability and dependency ratio is a proxy for the quality of the household's labour endowment (Bellemare, 2012). Bellemare, Birthal et al. (2008), Cai et al. (2008), Dedehouanou et al. (2013), Maertens and Swinnen (2009), Miyata et al. (2009), and Narayanan (2011), found households with larger family size were more likely to join the contract. This is so because many of the contracted crops need labour for supervision.

Higher dependency ratio would mean carrying for children and serving the elderly in household and all this would lead to increase in the demand for household work. This may in turn affect the availability of family labour for farm work (Bellemare, 2012). Maertens and Swinnen (2009), Miyata et al. (2009) and Randel (2005) found dependency ratios negatively associated with contract farming participation. This means that households with higher dependencies were less likely to join contract farming. However, Bellemare did not find dependency ratio influencing contracting participation.

Thus, overall literature suggests that influence of household characteristics on participation in CFAs is varied.

### **3.1.3.2. Education**

Education of the farmer and its association with CF participation studies provide diverse results. Most of the studies take years of formal schooling as a proxy to indicate education of the farmer. Arumugam, Fatimah, Eddie, and Zainalabidin (2010) in Malaysia, Narayanan (2011) for papaya and broilers in TN, Swain (2012) for rice seed in AP, Simmons et al. (2005) for broilers in Indonesia, and Cai et al. (2008) for rice in Cambodia found years of schooling to be positively associated with contract farming participation. There are also studies viz., Narayanan (2011) for marigold in TN, Swain (2012) for rice seed, Miyata et al. (2009) for green onion and apple in China found schooling to be negatively associated with contract farming participation. Thus, these studies found no evidence of bias against less educated farmers.

### **3.1.3.3. Agricultural Assets**

In this section, the relation between agricultural assets and contract farming participation is discussed. Agricultural assets of the farmer are one of the good indicators of his financial position (Chauhan, Mundle, Mohanan, & Jadhav, 1973). Agricultural assets comprise of physical farm assets and livestock possessed<sup>16</sup>. Livestock is considered as a proxy for liquidity and wealth (Hernández, 2009). According to Randel (2005), ownership of farm assets as well as access to non-farm income are linked to

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<sup>16</sup> Physical farm assets include ownership of bullock cart, electric/diesel motor, farm building, heavy agricultural machinery (plougher, rotravator, threshers, tillers, trolley, etc.), irrigation, and equipment.

undertake higher risk activities such as growing cash crops, which may include up-front investments.

Many studies have highlighted that contract farmer need have specific assets like irrigation facilities to grow the contracted crop (Erappa, 2008; Escobal, et al., 2000; Morvaridi, 1995; Simmons et al. 2005; Swain, 2011). This is mainly due to the nature of crop which required irrigation. Arya and Asokan (2011, p. 68) also pointed out that certain high-value crops require irrigation facilities and greater investments, thus only those farmers who could undertake those risks and investments become eligible for contracting. For instance, for growing asparagus crop in Peru, farmers having sufficient amount of capital, quality land and irrigation facilities could enter into CF (Escobal, Agreda, & Reardon, 2000). Similarly, for commodities like seed corn (Indonesia) and seed rice (India), only farmers' having irrigation facilities got eligible for participation in the contract (Simmons et al., 2005; Swain, 2011). Morvaridi (1995) for citrus in Cyprus and Nagaraj et al., (2008) for babycorn and chilies in Karnataka, observed that firms had criteria whereby only farmers are having irrigation were selected. The reason being that above mentioned crops need irrigation facilities. Otherwise, the crop would fail.

Birthal et al. (2008) for dairy, Dedehouanou et al. (2013) and Maertens and Swinnen (2009) in Senegal, and Simmons et al. for broilers found those who had a higher value of livestock was positively associated with contract farming participation. Miyata et al. (2009), in the case of apple, found CF having a greater value of agricultural assets compared to NCF. In contrast, Cai et al. (2008) for rice in Cambodia that those households having a lower value of assets were more likely to join contract. According to Key & Runsten (1999) firms favor small farmers because they are more likely to lack productive assets and have limited alternative income and production opportunities, which strengthens the firms' bargaining power (p. 390).

#### **3.1.3.4. Access to non-farm income and credit constraint**

Narayanan (2011) for broilers, Singh M. P., (2007) in Punjab and Swain (2012) for gherkin in AP found higher non-farm employment and income to have a negative relation with the probability of adoption of contract farming. Non-farm employment and income are associated relaxing credit constraint which encourages the farmer to self-finance for farm assets and crop inputs (Hernández, 2009). Thus, those farmers having access to non-farm income would not need the support of contracting firm to grow crops.

Similarly, Awotide et al. (2015), Ruben & Saenz, (2008) and Simmons et al. (2005) found that those with credit constraints had a higher probability of contract farming participation.

#### **3.1.3.5. Proximity to highway or market**

The distance of farm to the metaled road, highway or market also plays an important role in from farmers' perspective. For e.g., Awotide et al. (2015) and Leung, Sethboonsarng, and Stefan (2008) for rice in Nigeria and Laos respectively, Narayanan (2011) and Randel (2005) for cotton in India and South Africa respectively, found that further away they are from market, more likely they would participate CF. Wang, Wang, and Delgado (2014) mentions that farmers who are farther from the market may find additional security in contracting given their relative remoteness, and thus may be more likely to contract. Hence, CF effects may also be dependent on infrastructural development. Miyata et al. (2009) found the closer farmer is in proximity with village leader, more likely he would participate in contract farming. Cai et al. (2008) found households that were closer to the highway were more likely to join the contract.

#### **3.1.4. Motivation behind farmers growing under contract**

Masakure and Henson (2005, p. 1731) assert that motivations to participate in contract farming vary according to the prevailing situation of producers and that these relate to the existence, or not, of alternative economic opportunities and/or imperfections in local input and output markets. One of the major factor influencing participation is CF is that it provides a valuable source of income. Anecdotal evidence suggests that farmers decision to contract are associated with unobservable factors such as smallholder risk aversion, social networks, entrepreneurial and technical abilities, how much the grower trusts the firm or its representatives, etc. (Barrett et. al. 2012, p. 720). Many studies have reported that it is the farmers' perception of high returns and low risk involved, that influences farmers' decision to contract. Access to credit and timely supply of inputs are the other important factors that induce farmers to join contract farming (Barrett et al., 2012; Deshpande, 2005; Eaton & Shepherd, 2001; Guo (2008) cited in Wang et al. (2011); Keshavmurthy, 2005; Singh & Asokan, 2005).

Kliebenstein & Lawrence (1995, p. 1215) in their study of US pork industry, found a reduction in production and income risks as the primary reason for contracting followed by lack of capital. Wang et al. (2011, p. 502) found Chinese farmers' primary

motivation of contracting was not market price risk management, but rather seeking higher price and lower marketing transaction costs (i.e., the cost of planning, implementation, and supervision of market transactions). Wang et al. further notes that farmers consider contracting as a way to access demand. Delgado (1999) mentions the high perishability of certain products such as milk, which motivates to have an assured buyer. Also, for certain products such as cut flowers and vegetables that are exported may require a cold chain for handling. Thus, for dairy and meat producers, time specificity and up-front investment are high therefore having assured buyer is the prime importance. Similarly, Arumugam et al. (2010) and Masakure and Henson (2005, p. 1731) found that farmers perceived contracts to lessen the uncertainties associated with local markets, example, regarding input supply, market demand, and market prices. Randel (2005) also found assured buyer and lack of alternative market as major reasons to grow cotton under contract in South Africa. Similarly, assured market and good prices were major reasons cited by CF for preference of tree cultivation under contract in Tamil Nadu (Rohini, Selvanayaki, & Selvi, 2015)

Arumugam et al. (2010) and Masakure and Henson (2005, p. 1731) also found that farmers participated to acquire skills and receive extension services for producing new and existing crops. Farmers also perceived contract farming participation as prestigious and a source of self-satisfaction and social esteem. Arumugam et al. (2010), further notes that access to marketing information, transfer of technology and access to inputs as another important reason to join CF.

Keshavmurthy (2005) in his study of gherkin contract farming in Karnataka observed that fellow farmers and relatives play a key role in encouraging the farmer to enter into a contract. Thus, it seems are farmers are influenced by the success of co-farmers to join contract farming.

### **3.1.5. Disadoption of farmers from contracting**

According to Barrett et al. (2012), farmers might exit the CFA if they find that the CFAs delivers less than anticipated returns, i.e., if new outside opportunities emerge, or if their circumstances change. Thus, changing firm and smallholder attributes and learning from imperfect contract performance by both parties may lead to change in contracting status on both sides. However, this phenomenon has remained an understudied area.

Some of the studies have reported that over a period, either the farmer participation in CFAs has reduced or the CFAs had discontinued. In Ghana, 56% of surveyed farmers who ever joined the pineapple agro-export value chain had exited by 2009. Around half of these farmers mentioned the lack of buyers or problems with exporters as the main reason for exit (Harou & Walker, 2010 cited in Barrett et. al.). Bachke (2010) cited in Barrett et al. found that the rate of exit of farmers from farmers' organizations in Mozambique was also high (64% between 2002 and 2005). This is despite the estimated positive effects on welfare for smallholders who belong to those organizations.

Narayanan (2011) observed that the farmers routinely dropped out of CFAs. In her study of southern India, it was found that there was considerable in and out movement of farmers in CFAs. Among currently contracting farmers during the study, 73% of marigold farmers had at least one year when they did not contract after they had entered the contract farming. The corresponding figure was 64% for gherkins, and 93% for cotton. Similarly, Michelson (2010) cited in Barrett *et al.* (2012), found that 38% of all Nicaraguan farmers who supplied horticulture crops to supermarkets since 2001 had exited the channel by 2008. The study observes that there is a transition to a new equilibrium of profits for the farmers who exited the supply chain. As farmers had invested in irrigation, productive technologies and built new market relationships which allowed them to meet the transaction and quality requirements of the supply chain. Once these investments were made, farmers, no longer felt the need of contracts to insure against price risk, nor do they wish to abide by the other constraining prescriptions of the contract. Cai et al. (2008) found formerly CF's household income as well as non-farm income higher compared to CF. The study mentions that although progressive farmers in the village were first to participate in rice CF in Cambodia, they were also first ones to leave contract farming. The attrition of CF in remote areas was low; this was validated by data as formerly CF' farm were closer to market-road compared to CF. The reason for attrition of farmers cited in Cai et al. (2008) was that as later on, more market opportunities arose with the development of infrastructure, farmers switched to more profitable opportunities. Deshpande (2005) reported in the case of poplar and tomato that as farmers become specialized and experienced, they were found to leave contracts. In case of poplars in India, after few years of the introduction of the crop by Wimco Company, a competitive market developed for it. There was a huge demand emerging for poplar from furniture and paper industry where it can also be used in for raw materials.

Price at which poplars was sold in the market was higher compared to contracted price, which led to farmers dishonouring the contracts. Due to the rising demand of the crop, many firms started specializing in providing the nurseries of the plant. Thus, farmers no longer felt the need of contracting with the company. The company finally stopped the contracting scheme due to the opportunistic behaviour of farmers (Deshpande, 2005).

Narayanan (2010) observed that firm dropout has been quite significant in India. Firms have faced difficulties in maintaining contractual relationships in light of difficult contract enforcements, uncertain export markets or losing its market share due to domestic competition from other firms. Uncertainty in the domestic or foreign markets due to competition from domestic and foreign players leads to uncertainty in demand for the final products, which in turn leads to uncertainty about continuation of contract farming operations. Narayanan (2011) observed that a couple of the marigold firms stopped contracting when they failed to secure export orders. In gherkin, it was observed that the number of farmers and region contracted expands or shrinks depending on the market conditions crop at farm level stems from the consumer demand. Similarly, Campbells Ltd. abandoned vegetable contraction production in Mexico when bust followed boom in the economy (Warning et al., 2002). Similarly, around half of those farmers who had exited pineapple agro-export value chain mentioned, lack of buyers or problems with exporters as the main reason for exit (Harou & Walker, 2010 cited in Barrett et. al. (2012)). Thus consumer demand of the product is a basic determinant of farm demand for a processing variety crop. This point was also emphasized by Collins et al. (1959). Thus, market conditions play a crucial role in the continuation of CFAs

Barrett et al. (2012) report that due to the consistency of uncertain welfare results across the globe, CFAs had stopped at various places. In the case of tomatoes in Punjab, with the availability of cheaper Chinese tomato pastes, HLL and few other companies stopped contracting. Moreover, since revenue from tomato products did not contribute significantly to the overall revenues of the company, it did not take much care about the contract farming operations (Deshpande, 2005). Deshpande concludes that contract farming is a step in the evolution of competitive marketing and not a permanent substitute for it. It states that contract farming emerges due to certain market imperfections and once those market imperfections cease, contract farming as an institutional form of raw material procurement may come to an end.

## **3.2. Economics aspects of contract crop cultivation**

Most of the studies on contract farming in India have focused on aspects profitability and efficiency of farmers. The studies mainly examine the economics of the contract farming system in specific crops, compared with that of the without contract and/or competing traditional crops of a given region (Singh S. , 2009). In this section, the review of contract farming literature about the impact of contract farming is presented.

### **3.2.1. Introducing new crops**

It has been found that contract farming has helped to introduce new crops, facilitated crop diversification in many states. For e.g., poplar in northern India, tomato in Punjab, gherkin in southern India, barely in Rajasthan, medicinal plants in various parts of the country, etc. (Deshpande, 2005; Paty, 2005; Rangi & Sidhu, 2000; Singh & Asokan, 2005). Many studies have observed that contract farming does lead to a shift in the cropping pattern of the area. For e.g., Korovkin (1992) observed that agribusiness boom in Chile led farmers to shift from traditional crops like foodgrains to fruits and vegetables. Similarly, institutional innovations in Peru and profit differences led farmers to shift from traditional crop like cotton to asparagus, oranges, apples, etc. (Escobal, et al. 2000).

Delgado (1999, p. 185) notes that contract farming in Africa has facilitated the integration of smallholders into commercial agriculture. With contract farming, farmers diversified into various sub-sectors such as aquaculture, export-quality green vegetables, sugarcane, cotton, cocoa, arabica coffee, tea, dairy and cut flowers. Delgado further argues that in the context of missing markets in Africa, these are sectors where smallholders would otherwise unlikely be involved due to lack of the appropriate assets, technology, information, access to services and possibilities of marketing.

### **3.2.2. Technology transfer**

Contracting has facilitated the transfer of new technology to farmers (Arumugam et al. 2010; Eaton & Shepherd, 2001; Glover & Kusterer, 1990; Narayanan, 2011; Randel, 2005). As Eaton & Shepherd (2001, p. 12) point out that new techniques are often required to upgrade agricultural commodities for markets that demand high-quality standards. Similarly, new production techniques are often necessary to increase

productivity as well as to ensure that the commodity meets market demands. Private agribusiness offers technology diligently and supports it with their extension services.

PepsiCo introduced tomato crop in Punjab along with new technology like deep chiselling, new methods of transplantation, besides introducing new varieties of seeds. This resulted in significant increase in yields after contracting (Deshpande, 2005; Dileep et al., 2002; Rangi & Sidhu, 2000). Similarly, PepsiCo also introduced a direct seedling method of rice in Haryana and Punjab, which resulted in a reduction of cultivation costs of Rs. 1,500 per acre and 50% labour (PepsiCo India, 2012). Simmons et al. (2005) in the study of contract farming in Indonesia observed that farmers grew certain complex crop because of the company's help in the form of technical advice and extension services otherwise it was unlikely that they would have grown that crop. Eaton & Shepherd (2001) citing different studies provide numerous examples of such technology transfer across the globe through contract farming.

Glover and Kusterer (1990, p. 9) mention that input supply is weak in the least developed countries (LDCs). The rural agro-input shops are unable to supply seeds, agro-chemicals and fertilizers in sufficient quantities. Participation in contract farming helps small farmers in LDCs to access these inputs. Glover and Kusterer (1990, p. 102) also mentions the instances of technology transfer in Kenya, where sugarcane out growers learned about the importance and application of fertilizers, which they replicated to the other crops as well. Thus, contract farming helps pass on knowledge of modern technological inputs and its applications to farmers which they would use for other crops.

However, not all firms provide the extension services, Glover and Kusterer (1990, p. 9). For e.g. majority of asparagus contracted farmers in Peru reported of not received technical assistance from the company due to the negligent attitude of firm extension staff.

### **3.2.3. Productivity and returns**

Introduction of new technology and extension services through contract farming have led farmers obtaining higher yields and incomes (Awotide et al. 2005; Deshpande, 2005; Dev & Rao, 2005; Dileep, et al., 2002; Kumar, 2006; Miyata et al. 2009; Pandit, Pandey, Rana, & Lal, 2009; Rangi & Sidhu, 2000; Singh S. , 2000; Swain, 2010, 2011; Tripathi, Singh, & Singh, 2005; Warning & Key, 2002). Similarly, many studies using the production function or stochastic frontier analysis found that contract production was

more efficient compared to non-contracting mode of production (BIRTHAL et al., 2008; Delgado, Narrod, & TIONGCO, 2008; DILEEP et al., 2002; KUMAR, 2006; PANDIT et al., 2009; SRIDHARA, 2010; SWAIN, 2010; TRIPATHY et al. 2005). This signifies the importance of contract farming in boosting growth in the agriculture sector.

Contracting firms through their input control measures such as the scheduling of planting and the selection of crop varieties and field inspections help enhance the yields and quality of crops (Goodhue, 1999). Several studies have reported that contracting has helped in reducing price and yields risk for crops viz. oil palm (Dev & Rao, Food processing and contract farming in Andhra Pradesh: A small farmer perspective, 2005), potatoes (Pandit et al., 2009; Tripathy et al., 2005; Yashaskara, Suryaprakash, & Mandanna, 2010), fresh fruits and vegetables (Maertens & Swinnen, 2009). Similarly, Ramaswami et al. (2006) and Kalamkar (2011) observed lower mortality risks in case of broiler contract producers. Hog contracts in US, lowered growers' risks accompanied by lower growers' efforts as most of the inputs were provided by the firm (Key & McBride, 2003).

Contracting also reduces farmers marketing and transportation costs. In the case of gherkin and oil palm in AP, companies set up the collections centres in the village. Moreover, the company also bore the cost of transporting the produce from collection centre to the factory (Dev & Rao, 2005). Many of the firms provide direct transportation facility to lift the produce from the farms, which saves the farmers' transportation costs (Vijaykumar & Sonnad, 2010).

Many of the studies on contract farming in India determine the income benefits of contract farming, by comparing the net returns of contract producers from growing contract crop compared with that of the producers growing contract crop or competing for traditional crops of a given region without a contract. However, Barrett et al. (2012) question the above methodology for determining the impact of contract farming on income. They argue that as a selection of farmers into CFAs is not random. Suppose an entrepreneurial farmer decide to enter a CFA. His profits would be higher than his counterparts, owing to unobservable characteristics (entrepreneurial and technical ability, knowledge, social networks, risk behaviour, etc.) and his resource base (quality of soil and inputs). Therefore, a direct comparison of profits of CF and NCF could lead one to conclude, that contracting helps earn higher profits, without acknowledging the

possibility that it might be the higher ability farmers who participate (Narayanan, 2011, p. 202).

Barrett et al. (2012) mention that when we regress returns on observational characteristics and an indicator (dummy) variable whether the farmer is contracted farmer or NCF, then error term of the regression will almost never be uncorrelated with the observables or with the CFA participation variable. Thus, any estimate of the dummy variable parameter, the benefits impact of CFA participation will be biased and inconsistent. Which can lead to a mistaken conclusion that CFA participation benefits smallholders when it, in fact, it hurts them, or vice versa. For e.g., an entrepreneurial farmer may decide not to enter a CFA, as he believes he can do better for himself on his own. In this case, the unobserved entrepreneurial ability is inversely correlated with  $D_i$  (dummy variable CFA participation) but positively related to returns. In this context, our estimate of dummy variable parameter would, therefore, be negatively biased. Barrett et al. (2012) mention that to identify the causal impacts of smallholder CFA participation on welfare, one needs a research design that makes the  $D_i$  variable as credibly exogenous as possible or can at least bound how much unobservables could affect inferences.

Narayanan (2002, pp. 202-203) notes that an important challenge is, therefore, to account for factors that might implicitly influence both participation and the welfare outcomes. If these factors remain neglected, then higher profits might be wrongly attributed to participation. One empirical approach is to account for selection based on observables by using Heckman's selection model or Propensity score matching (PSM) to control for selection bias and then compute average treatment effect (ATE) where the treatment is participation in CFAs. Several studies viz. Birthal et al. (2008), Hernández (2009); Miyata et al. (2009), have used Heckman's selection model, while Awotide et al. (2015), Bachke (2013), Bolwig, Gibbon, and Jones (2009), Cai et al. (2008), Fischer and Qaim (2011), Leung et al. (2008), Maertens and Swinnen (2009), Minten et al. (2009), and Minten, Reardon, and Sutradhar (2010) use PSM to compute ATE. In general, these approaches rest on the assumption that selection into treatment, i.e., participation in CFAs, can be reliably based on observable characteristics (Dehejia and Wahba, 2002; Angrist and Pischke, 2009 as cited in Narayanan, 2011, p. 203).

Another approach to finding causal impact of contract farming on incomes as suggested in Barrett et al. (2012), is the use of Instrumental Variable (IV), in which participation is instrumented for by a variable that is correlated with participation but not

with the welfare outcome of interest. However, it is challenging to find an exogenous instrumental variable that is strongly correlated with participation in contract farming and not with an outcome (net returns) variable. There are some that have used IV to estimate causal impact of participation of CFAs on returns of contract crop cultivation. Bellemare (2012) using an experiment, derived farmers' willingness to pay to participate in contract farming instead of fixed return based on a game of dice as IV. Similarly, Warning and Key (2002) had used the trustworthiness of farmer, Simmons et al. (2005) used the number of organizations (including agricultural organizations) a farmer belongs to, Miyata et al. (2009) used distance between a farmer's farm and the farm of the village head, and Rao and Qaim (2010) used farmers' membership in a farmer group as IV. Bellemare (2012), Warning and Key (2002), Miyata et al. (2009), and Rao and Qaim (2010) found that participation in CFAs increases income by 10%, 39%, and 48% respectively. Many of the studies mentioned above, after correcting for selection, use endogenous switching regression to find out the impact of contract farming. Bellemare even found contract farming participation decreased the volatility of total household income and the duration of the hungry season experienced by the household by about two months. Minten et al. (2009) notes farmers that participating in CFAs have higher welfare, more income stability and shorter lean periods. Arumugam et al. (2010) farmers are perceived contract farming protected them against incurring losses.

Narayanan (2011) found that on an average CF for broilers, papaya, cotton and gherkin had higher net returns. Narayanan using treatment effect model concluded that contracted farmers were better of growing contracted crop. Similarly, NCF would have earned higher returns if they would have grown under contract. Similarly, Cai et al. (2008) found that had the never-CF contracted; their returns would have increased, but this is not the same for former-CF. Awotide et al. (2015) found ATE on the treated had a positive and significant increase in yield due to participation in contract farming. The increase of 58% in rice productivity and 64% in rice income was found. Swain (2011) found rice seed and gherkin CF earning double returns compared to NCF

#### **3.2.4. Impact on markets**

Contracting has been found to have a positive impact on the input and output agricultural markets for the contracted crops. This was reported in cases of milk, poplar, tomatoes, potatoes, safflower, etc. In the case of Marico's experience of contract

production of safflower in Maharashtra and Madhya Pradesh, it was observed that exporters and traders raised their prices due to competition from with the entry of the company for procurement for safflower (Singh & Asokan, 2005). BIRTHAL et al. (2008) observed that procurement by contracting agency led to the competition in milk markets which was otherwise dominated by vendors who often exploited the producers by paying them the less than the market price. Similarly, contractual innovations like providing inputs, credit and extension services in case of sugar beet in Slovakia led even other firms to imitate such arrangements to compete for the farmers. This induced direct positive effects for the farmers (Gow et al., 2000). Arumugam et al. (2010) and Chin (2015) mention about farmers in Malaysia, had little market information on prices, product quality and standards. But with participation in CFAs they were more aware of these aspects, which resulted in a reduction of post-harvest losses. Many studies state that effects of scaling up of contract farming will go beyond production and is likely to have several direct and indirect consequences for various stakeholders in the whole economy, as in multiplier effects in terms of income and employment will be significant in tertiary sectors directly or indirectly related to agribusiness supply chains (BIRTHAL et al. 2008).

### **3.2.5. Indirect benefits**

#### **3.2.5.1. Facilitating credit process**

Bellemare (2012) found contract farming participation increased the likelihood that a farm household receives a loan from a bank or a microfinance institution by about 31%. Similarly, several studies have observed contracting firms has facilitated the process of availing bank loan to farmers. For e.g., Wimco-poplar programme (Deshpande, 2005); Appache cotton in Tamil Nadu (Paty, 2005); Hybrid rice seed in AP (Swain, 2011), PepsiCo<sup>17</sup> for potato across many states in India, and Glover and Kusterer (1990) across Africa.

#### **3.2.5.2. Improving managerial skills of farmer**

Kumar (2006) founded that CF in Punjab used inputs judiciously and economically due to better guidance from the qualified research staff of firms which resulted in rise in overall land productivity of their farm. Similarly, Sharma, Pannu, and Phougat (2006) in

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<sup>17</sup> Source: <http://pepsicoindia.co.in/purpose/environmental-sustainability/partnership-with-farmers.html>

their study of contract farming in Harayana observed that contract farming helps in improving the managerial skills of the farmer and inculcates the concept of commercial cultivation. With improved technology adoption and better resource management learnt through contract farming, farmers in Madagascar were able to increase the productivity of other crops as well (Minten et al., 2009).

#### **3.2.5.3. Improving socio-economic condition**

Korovkin (1992) study observed that tobacco contract farming in Rinconada region of Chile, improved the economic positions of all sections of farmers. As landless labourers got employment in the region and small farmers were able to benefit with the rise in income through which they increased their landholdings or augment the animals. Tobacco sharecroppers were able to become independent producers. This was seen as the positive social transformation due to rise in agribusiness.

#### **3.2.5.4. Generation of high employment in farm area**

Many authors have reported that due to the adoption of the particular crop through contracting has helped generate higher employment for family labour and other labourers (Dev & Rao, 2005; Eaton & Shepherd, 2001; Erappa, 2008; Nagaraj et al., 2008; Swain, 2011). However, the impact of contract farming on employment is crop specific. For e.g., crops like tobacco, potato, gherkin, baby corn are highly labour intensive, hence the net effect on employment was positive. Whereas when farmers shifted their cultivation from cotton to asparagus in Chinchá zone of Peru due to contract farming, the net effect on employment was negative in the region (Escobal et al., 2000).

#### **3.2.6. Environmental considerations**

Some of the proponents have argued that contract farming facilitates adoption of new technologies and hence shall help in saving or sustaining the natural resources. One of the studies cited in Paty (2005) reported that that due to extension services and other price incentives provided by the McCain (I) Ltd. to its potato contract producers for adopting sprinklers and drip irrigation systems helped saving 40% of water, 20% of fertilizers and also increase the yield by 20%. However, some of the studies have reported that contract farming of certain crops has led to exploitation of natural resources. Dev & Rao (2005) reported that in the case of oil palm gardens, depletion of groundwater level is faster compared to other crops. Similarly, Swain (2011) reported

that irrigation intensity and usage of fertilisers and pesticides was higher for contract crops than for non-contract crops. Pomareda (2006) observed that contracting in Kenya for specific vegetables in a continuous manner led to the intensive use of land and water exhaustion.

Some researchers have also raised that CFAs may lead to mono-cropping, which would adversely affect the soil fertility and thus, the livelihood of smallholders (Da Silva & Shepherd, 2013). Repeated cultivation of tomato contract cultivation in Latin America without adequate rotation and/or chemical controls lead to a variety of soil infestations (Glover & Kusterer, 1990, p. 115). Some producers and agronomists in Mexico raised concerns about the soil depletion and forest degradation due to avocado contract farming, as the mono-cropping pattern was setting in (Romero, 2006, p. 81). Opondo (2000) observed that contract farming in Kenya has led to degradation of soil and exploitation of natural resources by following the same cropping pattern system. A point to note is that the even Punjab and Haryana are facing the similar problem due to the double mono-cropping pattern of rice-wheat (Chand, 1999; Rangi & Sidhu, 2000). Thus, it may not be appropriate to say that contract farming leads to land degradation. Instead the point is how the farmers utilise their land, i.e., following crop rotation may prevent land degradation.

Many companies do understand the importance of sustainable farming and focus their research and development towards developing seed varieties, agricultural practices that save water. Similarly, as mentioned in Section 3, PepsiCo introduction of the direct seedling plantation of rice resulted in 30% reduction in water consumption and cutting down on greenhouse gas emissions by 75%, while keeping the yields and quality at par (PepsiCo India, 2012). They also through their policy took necessary steps, such as incentivise farmers to go in for drip-sprinkler irrigation to save water.

There have also been instances where companies have ignored the environmental consideration. Morvaridi (1995) observed that firm encouraged farmers to expand citrus cultivation even though the problems of water shortage and salinity were surfacing. Such environment costs are borne by the farmers, as when productivity had fallen company tries to expand or shift the cultivation in the new regions. Similarly, Swain (2011) reported that in the case of gherkin in Andhra Pradesh when the productivity of particular region declined, the company shifted the production to other farmers and

regions. Thus, the farmer may earn short-term profits, but in the long run there are environmental costs which are detrimental.

### **3.3. Problems faced in contract farming**

In addition to benefits in CFAs, farmers do face certain problems or constraints in contract farming. Chin (2015) cites that farmers felt application process to be complicated for growing fresh fruit and vegetables under contract farming in Malaysia which is mediated by State's Federal Agricultural Marketing Authority. This hinders the participation in CFAs. Moreover, Suryandari and Buang (2010) as cited in Chin (2015) commenting on contract farming in Malaysia, noted about the prices at times in contract being lower compared to market price, which was the major cause of dissatisfaction among farmers. Similarly, farmers in Tumkur district were dissatisfied by the lower price paid by contracting firms (Kumar & Kumar, 2008, p. 249)

Another problem faced in asparagus contract farming is of low yields than expected. For e.g., asparagus contracted farmers in Peru reported of having lower yields due to pest attack. The reason cited was these farmers have been slow to accept the new recommendations for several reasons. Farmers did not trust the advice of agronomists that using lesser quantities of cheaper fertilizer earlier in the plant cycle will produce better yields at harvest time. Moreover, farmers did not appreciate the attitude of agronomists regarding communication. The reduction in yields led to losses which caused debts and dissatisfaction among farmers (Glover & Kusterer, 1990, p. 59). However, such problem are crop and location specific. It would be inappropriate to generalise with it for the contract farming as an institution.

Disputes in contracts have mostly aroused over quantity, quality, and payments (Deshpande, 2005, p. 56; Glover & Kusterer, 1990). Given the heterogeneity in agriculture, there have been problems of moral hazards and adverse selection as yields, market demand and prices and quantities in market undergo tremendous changes in each season, which may lead to an opportunistic behaviour by each of the party in CF (Satish, 2003; Singh S. , 2007)

Glover and Kusterer (1990) mentions, that potato grower seeing the good income in initial years had invested in potato equipments. Thus, the problems of debt, specialised investment and monopsony led them being locked in CFAs.

One of the major problems faced by companies is the selling of the produce by farmer outside the contract (Deshpande, 2005; Dev & Rao, 2005; Dileep et al., 2002; Kumar & Kumar, 2008; Narayanan, 2012; Roy, 1963; Singh S. , 2000; Singh & Asokan, 2005). As Glover and Kusterer (1990) mentions that as market prices rise above the contract price, there is a great temptation for farmers to sell on the market. Even Roy (1963) in his review of contract farming in the USA reported that farmer shall break the contract when the market price is higher and bring back all the produce when the market price is lower. The default rate is observed to be high for the contracted crop only if the gap between contract and market price is large. Minten et al., 2009 observed that farmers in Madagascar grew the contracted crop on additional plots in addition to the contracted area. When the prices were higher in contracts compared to spot markets, they used the produce of the other plots and sold it to the firm. While when the market prices of the goods were higher, the company faced a significant decrease in the quantity supplied. The owner of Nijjer Agro Ltd. had also reported that tomato CF mixed 10-12 quintals of water/mud in each truck for which the company had to bear the financial loss (Rangi & Sidhu, 2000). Will (2013) also mentions of the moral hazard problems like such as diversion of inputs or side-selling.

The opportunistic behaviour has also been observed from the company's side. For instance, HLL (India) in Punjab was reported to have not procured from farmers many times, especially when they over-contracted acreage and yields are good (Singh S. , 2002, p. 1630). In Andhra Pradesh, for 63% of CF, there was a partial breach of contracts in gherkins as the firm did not procure as per contract terms (Swain, 2011). Many studies have observed that farmers faced delay in payments, manipulation of norms and problem of rejection of their produce (Arunkumar (2002) cited in Sridhara (2010); Dileep et al., 2002; Keshavmurthy, 2005; Kumar & Kumar, 2008; Kumar & Singh, 2009; Vijaykumar & Sonnad, 2010, Swain, 2011; Will, 2013). Daddieh, Kwame, & Little (1995, p. 5) in their study of pineapple producer in Ghana mention about occasional incidences of delays in being payments, non-payments, or reduced payments based on false claims of product quality. Due to delays in payment, most of the gherkin farmers were forced to sell their assets and take non-institutional credit to pay wages to the labour employed for the contracted crop (Swain, 2011). Daddieh et al. reports of incidences, where contracting firms did not turn up to procure output; or wanted to buy when fruits were immature; and only purchased the best fruits rather than the agreed upon quotas (p. 44).

Another kind of problem reported by Glover and Kusterer (1990, p. 114) and Singh S. (2002) in Panama and Punjab (India) respectively was the poor coordination of the delivery of tomatoes at the factory gate, whereby farmers have to wait at the factory gate for more than a day. A similar problem was reported in the case of mint (Singh S. , 2009) and potatoes (Kumar, Pandey, Rana, & Pandit, 2009) in Punjab. In the case of tomatoes, this results in longer delays result in spoilage, weight loss of the produce and higher rejection rate for the farmers (Singh S. , 2002). Glover and Kusterer (1990) also reported that McCain Ltd. for potatoes in Cannada, while banana industry in Ecuador resorted to manipulation of inspection standards to control deliveries when production was more than demand. Tomato contract growers in Honduras (Latin America) during 1980-81 also reported about long waits to rent company-owned harvesters, highly variable reject rates, and low prices (Glover & Kusterer, 1990, p. 113). Similarly, cauliflower contract seed growers complained about the absence of written legal agreement, lack of prior price information, near monopoly of big firms, deductions made on account of the moisture content and foreign material in the seed (Kumar & Singh, 2005). Kumar and Kumar (2008) also mentions about the problems faced by CF to meet the firms' quality requirements (p. 249).

Companies do not pursue legal action against defaulters as it is neither feasible nor politically wise (Glover & Kusterer, 1990). Moreover taking legal action would create a negative image among farmers (Roy, 1963; Singh S. , 2002, p. 1630). In the case of seed contracts, although there was a clause of penalty in case of default by the farmer but it was rarely implemented (Singh S. , 2004). The poorly developed legal institutions, the small amount involved and potential souring relationships between agribusiness and farming communities makes that the only threat at the disposal of the firm is to discontinue the contract with the farmers (Minten et al., 2009). In the absence of effective enforcement mechanisms, there is little that a farmer or firm can do against the opportunistic behaviour of opposite (Swain, 2011). Hence, for effective enforcement of the contract, the firm tries to build a relationship based on trust. Provision of inputs and services and visits of honest field staff of company does have a positive influence on contract relationship (Naidu, 2012).

### **3.4. Gaps in literature**

Several studies in India, reviewed so far examined mostly the cost-benefits of the CF in specific crops and in some cases also the technical efficiency, compared with that of the NCF for a particular transaction/season only. There were also some studies examining participation issues. The success of contract farming scheme cannot be judged by just one transaction at a time. Moreover, much of the literature on contract farming have tried to estimate the welfare gains made due to the intervention of contract farming. However, the empirical literature on contract farming is limited in scope. This is partly due to the relative paucity of high-quality survey data on contract farming (Barrett et al. 2012). Williamson (1985) suggests full assessment of contract requires that both contract execution and ex-post competition at the contract renewal comes under scrutiny.

Naidu (2012) notes literature especially in India has not adequately focussed on the issue of continuity of relationship or breakups in contracts. The motive behind the decisions of firm relating to vertical coordination (whether to contract or not) is purely “economic” i.e. in a sense to get the job done in the cheaper or better way (Mighell & Jones, 1963). Thus, changing attributes, circumstances and learning from imperfect contract performance by both parties may lead to change in contracting status on both sides. However, this phenomenon has not been adequately dealt. Moreover, little is known about the performance of contract farming scheme in the sense how the firms are building and managing the long-term relationships with farmers. The general problems of contract theory i.e. hold-ups and moral hazard have also not been adequately looked in the contract farming studies in India.

### **3.5. Concluding Remarks**

In this chapter, discussion about the previous work in the light of the research questions to be addressed in the thesis was presented. Studies so far have suggested, that in many cases it is the farmer who voluntarily decides whether to grow the crop in contract or not. It has been seen that all kinds of farmers participate in contract farming, whether small or large, educated or uneducated, young or old, experienced and inexperienced. Determinants of participation depend on the crop characteristics, agro-climatic factors, and local infrastructures such as roads, market access, alternative

earning opportunities, family conditions, farmers risk and entrepreneurial abilities. However, the impact of these variables has been found heterogeneous.

Overall, review notes that contracting helps in resolving market failures by providing access to credit and reliable inputs, provision of extension services, etc. which may be inaccessible without contracting. Thus, contracting helps reduce yield, input and price risks. The risk reducing the aspect of the contract facilitates technology adoption (Glover & Kusterer, 1990). Risk reduction provides incentives to farmers invest in yield stabilizing technologies such as irrigation facilities or yield-increasing inputs such as fertilizer or improved varieties. It is these factors that motivate farmers to participate in CF. Most of the studies have found that contract farming has helped increasing productivities and returns from cultivation. Till date research indicates that the major sources of farmer gains from contracting arise from the resolution of market failures, economies of scale or economies of scope gained mainly through dis-intermediation in the wider context of marketing system and reduced exposure to market risk (Barrett et al., 2012, p. 719; Singh K. , 2004).

Some of the problems faced in contract farming are due to uncertainties of market faced by firms' final products, and other is due inefficient management by the firm staff. As demand for crops is derived demand, therefore sometimes firm instead of the adverse market condition had to discontinue contract farming. Some of the problems related to how firms staff can manage the contract farming operations. It is important that firm staff are diligent and able to communicate well with the farmers for the success of contract farming scheme. Singh K. (2004) notes that contracting firms' assistance in technology transfer for contract crop cultivation and flexibility of incorporating market uncertainties through adjustments in contracted price from time to time is vital in continuity of CF relationships.

There were also environmental issues being raised about impact on land fertility due to mono-cropping pattern induced by contract crop production. Given the heterogeneity of crop characteristics and contract-farming relations, it is not possible to have a general theory of contract farming. Rather, the emphasis should be on understanding this phenomenon in relation to local conditions (Little, 1994).

In the next chapter, methodology adopted to fulfil the objectives of the thesis has been elaborated.