CHAPTER 9
SUMMARY AND CONCLUSIONS

9.1 Introduction

Punjab's agrarian economy was acknowledged for its opulence since the introduction of green revolution, however in 1980s, agriculture sector started showing the signs of deceleration and stagnation in yield level of major crops. As the state agriculture moved towards specialization of wheat and paddy crop that has formed the serious concern for the sustainability of profitability in the long run and maintenance of eco-system. Thus, the policy makers and various studies recommended for the diversification towards F&Vs (Singh, 2004; Dhillon and Singh, 2006). It is argued that diversified agricultural economy is expected to enhance farm income and reduces the risks of the producer. However, the traditional marketing of F&Vs is quite complex and risky phenomenon in India as there is long chain of intermediaries in the marketing that leads to very small fraction of every rupee of profit to the farmer. In this context, alternative institutional arrangements such as contract farming can play a vital role to minimize transaction costs related to uncertainty and market failures associated with high value crops. It is also argued that linking farmers to contracting firms may also cause a shift in the cropping pattern toward high value crops and consequently, result in diversification away from traditional crops like wheat-paddy.

There exist several studies which explore the linkages between contract firms and the farmers. Most of the contract firms excluded small farmers from the contractual arrangements because of higher transaction costs (Kumar, 2006; Glover and Kusterer, 1990; Singh, 2012; Singh, 2016). Various studies affirmed higher net returns among contract farmers as compared to their counterparts due to higher prices (Rangi and Sidhu, 2000; Dev and Rao, 2005; Nagaraj *et al*., 2008; Singh, 2009; Swain, 2010). However, firms procured only specified quality of the produce from the farmers. Further, the farmers of Pepsi, HLL and Nijjer also reported several problems like poor coordination of activities, low prices, preferences for large farmers, delayed payments, outright cheating in dealings, manipulation of norms by the firms, etc. (Singh, 2004; Singh, 2012). Thus, there exists much diversity among contracting firms about the procurement operations and linkage building with the farmers as the contracting practice differs from crop to crop that it is unfeasible to generalize the viability of contract farming over time. Thus, in context of Punjab, an attempt has been made to explore the contract farming potential of the new crops introduced by some of domestic contract farming companies along with one of the oldest MNC in state besides exploring the efficiency of production, diversification potential of the crops and factors influencing farmer's participation in contract farming. The specific objectives of the study are: (1) to examine nature of contracts and procurement operations of the contract farming firms; (2) to compare socio-economic characteristics of the contract and non- contract farmers; (3) to analyse costs and returns among contract and non-contract farmers for the same/alternative crops; (4) to examine factors determining the farmer's participation in contract farming; (5) to analyse the role of contract farming in farm diversification and employment; (6) to examine the technical efficiency in crop production across contract and non-contract farmers; (7) to study the perceptions of the farmers and the firms regarding the practice of contract farming system; and (8) to suggest suitable policy measures to revive the state's agrarian economy in the presence of contract farming.

9.2 Methodology

The study is mainly based on primary data conducted during December, 2015 to June, 2016. Three companies, one MNC viz. PepsiCo and two local companies viz. Rana Sugars Limited (RSL) and Paras Spices Pvt. Ltd. involved in direct procurement and processing of potato, sugarbeet and chicory respectively were selected for the study. The districts were identified on the basis of maximum area under the contract with each company. Accordingly, Ludhiana and Moga districts for Pepsico, Moga for Paras Spices Pvt. Ltd., and Tarn Taran and Amritsar districts for RSL were identified. A sample of 50 farmers under contract with each company was taken through the stratified random sampling. Another sample of 50 potato non-contract farmers in the vicinity of the PepsiCo and 50 wheat farmers in the vicinity of RSL and Paras Spices Pvt. Ltd. each selling in the traditional market was also taken based on the proportion of farmers in each category in each location through the stratified random sampling technique. Thus, the study was carried out with 150 contracted and 150 non-contracted farmers constituting a sample of 300 farmers. Both sugarbeet and chicory are *rabi* crops and there is no open market for the sugarbeet and chicory as such and the firms itself were the sole buyer in the Punjab. Thus, economic analysis of the crop viability is possible only with the alternative wheat crop in the vicinity of the sugarbeet and chicory growers.

9.3 Operations of Contracting Firms in Punjab

PepsiCo practiced contract farming with 400 farmers at about 2500 acres of land. RSL had 3000 contract farmers under sugarbeet with around 9000 acres, while Paras Spices Pvt. Ltd. practiced contract farming with 150-200 farmers in Punjab on about 450 acres of land. All the three companies were involved in providing agri-inputs to the farmers either directly or through some other agri-input companies. PepsiCo delivered seeds at farmers' farm at 60 per cent of the payment in cash, while another 40 per cent was deducted from the produce. Similarly, RSL supplied seeds at 75 per cent subsidized rate and Paras Spices Pvt. Ltd. at ₹ 1700/acre. PepsiCo provided chemical kit at ₹ 3220/acre on distributer rate through Bayer that costs about ₹ 4,000/acre to farmer if purchased from the market, while RSL provided fertilizers at 25 per cent subsidized rate. The field agronomist of PepsiCo, RSL and Paras Spices Pvt. Ltd. visited the farms with the gap of 2, 7 and 15-20 days, respectively to provide technical guidance to the farmers. PepsiCo also gave yield based incentive to encourage farmers to increase yield level on the basis of A and B grade production. If a farmer produces 70 per cent A and B grade produce, he was given an incentive of ₹ 35/quintal Similarly, on 75 per cent A and B grade produce, an incentive of ₹ 40/quintal was given, while on producing 80 per cent A and B grade produce, ₹ 50/quintal incentive was given. The company provided a bonus of ₹ 1.1/ kg that included bonus of ₹ 0.30 for chemical kit, ₹ 0.20 for grading, ₹ 0.10 for insurance and ₹ 0.50 for permanent shed facility along with fixed price for seed potato. If RSL failed to procure crop of the farmer, the firm was conditioned to pay the amount equal to the prevailing MSP of wheat for the yield of 20 quintal/acre. PepsiCo procured all grades of seed potato produce except the rotten and cross-cut potatoes on the basis of different grade price. RSL and Paras Spices Pvt. Ltd. procured the entire produce of the crop under contract from the farmers without any grading after applying deduction on the basis of mud and leaves in the produce as there was no another market for the crops in the state. PepsiCo directly procured from the farmers at the farm gate itself while, RSL and Paras Spices Pvt. Ltd. procured at company at the pre-agreed price. PepsiCo provided the transportation facility to the farmers, while in case of Paras Spices Pvt. Ltd., farmers themselves had to deliver the produce. However, RSL provided ₹ 10 more than the fixed price for produce as transport charges to those farmers, who supplied over a distance of 20 km, while for those who brought it from more than 100 km, the company arranged truck facility and transport cost was equally borne by both the parties. PepsiCo made payment through Karur Vysya bank within 10 days after the delivery of last produce by deducting 40 per cent seed cost from the produce, while Paras Spices Pvt. Ltd. made payments within one week after procuring the produce through cheque after deducting the input costs and the payments were generally done on Wednesday. RSL made payments within one month after procuring the produce by deducting the input costs. PepsiCo also provided a loan facility of ₹ 25,000 per acre through Karur Vysya Bank, subjected to a maximum amount of ₹ 2,50,000 without any interest. RSL also provided loan facility of ₹ 20,000/ acre to farmers for sowing sugarbeet with a maximum amount of loan ₹ 1,00,000.

9.4 Socio-Economic characteristics of Contract and Non-contract Farmers

The results of the study revealed that all the firms preferred to work with large farmers as 66 per cent of the potato, 22 per cent of the sugarbeet and 38 per cent of the chicory contract farmers belonged to large farmer category. Further, average size of operational land holding was also higher among potato (38.44 acres), sugarbeet (24.36 acres) and chicory (25.7 acres) contract farmers as compared to non-contract farmers (22.2 acres, 11.9 acres and 12.3 acres, respectively). The share of leased-in land in operational holding was also higher among contract farmers as against to non-contract farmers for all the three firms. The contract farmers of PepsiCo and RSL on an average attended the school relatively for more number of years than the non-contract farmers, while the reverse was true in case of Paras Spices Pvt. Ltd. Further, the proportion of illiterates was also higher in case of PepsiCo and RSL non-contract farmers as compared to their contract farmers while it was same for both categories of Paras Spices Pvt. Ltd. The average age of the contract farmers was slightly lower than the non-contract farmers that meant relatively younger farmers adopted modern supply chains. The income from non-farm sector was higher among contract farmers of all the firms i.e. ₹ 6600/month in case of PepsiCo, ₹ 10,080/month in case of RSL and ₹ 4660/month in case of Paras Spices Pvt. Ltd. as compared to their non-contract farmers ₹ 4500/month, ₹ 5,240/month and ₹ 2430/month, respectively. Further, the average income from allied farm activities was also higher among RSL and Paras Spices Pvt. Ltd. contract farmers as compared to their non-contract farmers, while it was lower in case of PepsiCo contract farmers as compared to their counterparts. The contract farmers of all the firms also had higher ownership of farm machinery than non-contract farmers.

9.5 Diversification across Contract vis-à-vis Non-contract Farmers

Among PepsiCo contract farmers, the highest proportion of area was devoted to paddy (38.63 per cent) followed by potato (20.62 per cent) and wheat (17.09 per cent). The area under contract crops was only 13 per cent, while 87 per cent of the gross cropped area (GCA) was under non-contract crops. The medium and large farmers under potato contract also grew it for open market as the company provided seed for the maximum 10 acres, while some farmers grew it for spreading the risk as sometimes open market prices rose more than the contract prices. On the other hand, in case of non-contract farmers, paddy occupied the highest proportion of GCA (36.6 per cent), followed by potato (25.7 per cent), moong (16.1 per cent), wheat (11.2), mint (4.7 per cent) and maize (4.0 per cent). The extent of diversification achieved through contract farming in case of potato crop was disappointing as indicated by SID. The value of SID among contract farmers (0.44) was lower as compared to that among non-contract farmers (0.52).

In case of RSL, contract farmers had 11 per cent area under sugarbeet and 10 per cent under sugarcane. The contract farmers had lesser proportion of GCA under wheat (27 per cent) and paddy (39.6 per cent) as compared to the respective figures of non-contract farmers was 42.3 per cent and 46.8 per cent. The cropping intensity among non-contract farmers was turned out to be higher than contract farmers. As the contract farmers had about 10 per cent of the GCA under sugarcane annual crop as compared to just 0.4 per cent of the GCA in case of non-contract farmers. The comparatively more diversification was observed in case of contract farmers than that of non-contract farmers. The SID value turned out to be 0.33 in case of contract farmers as compared to 0.11 in case of non-contract farmers. In case of Paras Spices Pvt. Ltd., the contract farmers put 8.2 per cent of the GCA under chicory. The non-contract farmers had higher proportion of GCA under wheat (43.7 per cent) and paddy (47.8 per cent) as compared to 29 per cent and 45.5 per cent, respectively in case of contract farmers. The SID value was 0.26 in case of contract farmers as compared to 0.08 in case of non-contract farmers.

9.6 Economic Impact of the Contract Farming

The production cost of potato was turned out to be higher for contract farmers (₹ 47,456.5/acre) as compared to that for non-contract farmers (₹ 33,294.1/acre). However, the contract farmers did not incur any marketing costs while selling the produce to the contract firm as the produce was farm-picked by the firm. Further, labour for grading along with grader was also provided by the company to the contract farmers, while non-contract farmers, themselves had to bear the grading cost, which amounted ₹ 5,349.3 per acre. The average yield of the potato was higher among non-contract farmers (128.8 quintal/acre) than that among contract farmers (85.58 quintal/acre). The company procured A and B grade produce at ₹ 10/kg, C grade at ₹ 8/kg, while D and Z grades were procured at ₹ 4.5/kg each. However, non-contract farmers sold seed grade at ₹ 8.2/kg, table grade at ₹ 6.6/kg and *goli* at ₹ 1/kg. The net return in case of contract farmers was higher ₹ 17208/acre than that in case of non-contract farmers (₹16149.4/acre).

In case of RSL, the cost of production for sugarbeet crop was ₹ 38,371 per acre and for wheat crop, it was ₹ 20,718 per acre. The contract farmers spent about 17 per cent of the total cost only on weeding. The transportation cost was also high among contract farmers as they themselves had to deliver their produce at the company but on the other hand non-contract farmers sold their produce in their own village or nearby villages' focal point. The average yield in sugarbeet was 304.2 quintal/acre and in wheat, it was 17.18 quintal/acre. The average price was ₹ 167.6 per quintal and gross return per acre was turned out to be ₹ 50,967.4 among contract farmers. The average price for non-contracted wheat crop was ₹ 1550 per quintal and gross return was worked out to be ₹ 26,629 per acre. Thus, the net return in case of sugarbeet crop was ₹ 10,200/acre as compared to ₹ 5,230/acre in case of wheat crop.

In case of Paras Spices Pvt. Ltd., the cost of production for chicory crop was turned out to be ₹ 45,048/acre and for wheat crop was only ₹ 20,856/acre. The average yield in chicory crop was 198.1 quintal/acre and in wheat, it was 16.7 quintal/acre in Moga district. The average price received for chicory was ₹ 340 per quintal and gross return per acre were turned out to be ₹ 67,354. For wheat crop, the farmers received average price ₹ 1550 per quintal and gross return was only ₹ 25,885 per acre. The net return in case of contract farmers was ₹ 19,450/acre as compared to ₹ 4601.7/acre in case of non-contract farmers. Thus, the contract farmers of all the three companies realized higher net returns than non-contract farmers. The contract farmers for all the three crops viz. potato, sugarbeet and chicory sold their entire produce to the company immediately after harvesting. While potato non-contract farmers sold their 83 per cent produce and stored the remaining for seed or to sell in the lean season. Further, wheat non-contract farmers sold around 85 per cent of the produce and the remaining was stored for domestic use and seed in the vicinity area of sugarbeet and chicory contract farmers.

9.7 Determinants of Farmers’ Decision to Participate in Contract Farming and Impact on Income

The treatment effect model shows that participation in contract farming raised the gross income of potato and it was positively affected by the farm size, off-farm income, agricultural machinery, proportion of area under non-traditional crops and being a contract farmer. In case of sugarbeet crop, gross income was positively affected by the farm size and participation in contract farming. For chicory crop, household size, farm machinery and farm size had a positive and significant influence on the contract farming participation. It can be conjectured that the contract farming participation was a non-random selection in case of PepsiCo and Paras Spices Pvt. Ltd. as the *ath* parameter was statistically significant. However, the *ath* parameter was not statistically significant in case of sugarbeet farmers, implies that there was no selection bias. This indicates that selectivity bias holds no influence on sugarbeet income earned from contract farming.

9.8 Technical Efficiency

The farmers grown potato, sugarbeet and chicory crop under contract farming were found to be more efficient than the non-contract farmers. The mean technical efficiency score under VRS for the contract farmers was 0.95 in case of potato, 0.97 in case of sugarbeet, 0.98 in case of chicory; whereas for non-contract farmers, it was 0.92 for potato, 0.95 and 0.96 for wheat crop. By receiving technical know-how from the extension specialists of the contracted companies for the new contracted crops, the farmers gained more knowledge about their resources and practices that made possible for them to use assets more efficiently. Thus, better agricultural practices along with technological development by the contracting firms made them more efficient.

9.9 Labour Absorption

The vegetable contracted crops created more employment opportunities particularly for the women as these required more rigorous workers at farm. PepsiCo provided trained labourers for grading to the contract potato growers while, non-contract farmers employed more female labour for harvesting and grading due to their lower daily wage rate as compared to male labour. In sugarbeet cultivation, labour was required for 26.7 man days per acre. For manual weeding operations, female workers were preferred by the farmers to reduce their cost of cultivation. While in case of traditional wheat crop, only 6.58 man days per acre were obligatory. No female worker was involved in the cultivation process of wheat. 23.36 man days per acre were required for contracted chicory crop season while for non-contracted wheat crop; it was 6.12 man days per acre.

9.10 Contract Farming from the Producers' and Company's Perspective

In case of PepsiCo, 84 per cent of the farmers did not read various contract agreement provisions before hand and just signed it. Only 28 per cent farmers had the copy of contract being provided by the company and others revealed their trust with the company through surveyors and did not feel the need of a written documentation. 70 per cent of the contract farmers availed the credit facility from Karur Vysya Bank through the company. 80 per cent of the contract farmers argued that they adopted contract farming for the stable prices provided by the company. They argued that there exist wider price fluctuations in potato over seasons due to the variations in its production and availability in the market. All the non-contract farmers were familiar with contract farming and among them 12 per cent also had contract previously. Disputes related to side selling and qualities were primary reasons for not continuing the contract. Forty six per cent of the non-contract farmers wanted to engage in contractual relationship if they got chance in future. The company officials pointed that they preferred to choose farmers with 5 to 10 acres of land. However, in actual to most of the large farmers, the company has signed contract agreement with more than one member of the family by giving more than one vendor ID.

The benefits of potato contract farming were estimated using Henry Garrett ranking. Assured market scores the first rank with a Garrett score (79.22) followed by assured price with 70.88 mean score. Quality seeds, fixed income, extension services and transportation of produce by the company were other major benefits of potato contract farming in that order. Further, Henry Garrett ranking technique was also used for ranking the problems of the farmers. Costly seeds with 70.12 average score was ranked first followed by low price of the produce with mean score 66.7. Other problems were shortage of labour, excessive grading by the company, late payment, transportation cost for the seeds, high rotten rate of seed provided by the company and provision of unrequired fertilizers.

In case of RSL, only 72 per cent and 6 per cent of the farmers conceded for the written contract and about copy provision, respectively. 76 per cent of the contract farmers had taken the credit facility from IDBI bank. During 2014-15 crop season, payments of farmers were delayed even for 3-4 months. Due to which large number of farmers didn’t wanted to grow sugarbeet for next year. So the company started loan facility to the farmers through IDBI bank. But 50 per cent of the contract farmers thought that the company had given them half payment in advance and even had consideration in mind that if the company would not procure their crop than also they would be on the safe side. 90 per cent of the contract farmers selected the contract crop sugarbeet as it gives more income than wheat crop. 32 per cent farmers were attached to contract farming as it helped them to get procurement slips for sugarcane easily. Among non-contract farmers, 80 per cent farmers were aware about the sugarbeet contract farming in their area and 36 per cent of them, also wanted to get involved in the same if get chance in future. There were 6 per cent non-contract farmers who previously worked under the contract. However, they discontinued the contract with the company due to delayed payment and costly inputs. The major benefits of sugarbeet contract farming as perceived by the farmers were higher income with a maximum average score (72.2) followed by the diversification from traditional wheat crop with 65.22 Garrett score. Henry Garrett technique was also used for examining the production and marketing problems. Shortage of labour, weed attack, high input cost, low price, late payment and high marketing cost were some of the major problems. The major reason among non-contract farmers for not entering in the contract was smaller size of land holding and costly inputs of the new contracted crop.

In case of Paras Spices Pvt. Ltd., the major reasons for adoption of new chicory crop among farmers was higher fixed income, demonstration effect and land quality was not suitable for wheat. Only 46 per cent confirmed the written contract, while none of the farmers had a copy of the contract. The company conceded that they used to select farmers from all over Punjab however; it was found during the survey that 96 per cent of the contract farmers belonged to Moga district only. The benefits of chicory contract farming through Henry Garrett ranking suggested that diversification away from wheat was the major benefit with 69.76 score followed by higher income (67.28 score). 98 per cent of the contract farmers wanted to continue the contract for chicory crop and forty per cent of the non-contract farmers also wanted to engage in contractual relationship. Along with benefits, farmers also faced some of the marketing issues in contractual practice. The foremost issue was low price with 68.24 mean score followed by default in procurement procedure (52.36 Garrett score) and transport difficulty (48.18 Garrett score). Non-contract farmers considered the most important reasons for their non-involvement in contract farming was less availability of family labour and transport issue, smaller land holdings and couldn’t get seed as the company preferred to work with same farmers rather than choosing new farmers.

9.11 Conclusions and Policy Suggestions

The comprehensive analysis of companies- PepsiCo, RSL and Paras Spices Pvt. Ltd. involved in direct contract farming of Punjab reveals that emergence of agri-business firms has created an option for farmers to increase their income and diversification away from traditional wheat crop. All the three firms procured the entire produce of the contracted crops at the pre-fixed prices. Notably, the firms gave guaranteed market as well as assured prices and farmers were left to shoulder only production risks. Thus, private players' role in extension and training the farmers is a welcome step, but malpractices such as fixation of 10 acres under contract restricts the participation of small, marginal and even semi-medium farmers. Further, in present case study, remuneration from sugarbeet and chicory crop was attractive enough that the farmers can move away from traditional wheat cultivation. Furthermore, the potato contract farmers earned slightly higher income than non-contract farmers, but stability in prices over the years seems to be profitable. While, for non-contract farmers whenever there was glut production, the prices fell down sharply in open market. As in 2015 and 2017 season, the non-contract farmers received on an average ₹ 160-250/quintal. No doubt, in 2017 season, Punjab government rescued the farmers by instructing education department to buy potatoes from farmers at ₹ 500/quintal for mid-day meal scheme. Even Shiromani Gurdwara Parbandhak Committee (SGPC) purchased directly from the farmers at ₹ 800/quintal but this does not seems to be permanent solution. In context of potato crop, the farmers had options to sell their produce to another contract firm like Mahindra Shubh Labh Ltd. or in open market in case of higher prices. So the chances of side selling were possible, but strictly execution of blacklisting for defaulters played an important role to avoid this activity. However, in case of sugarbeet and chicory crops, farmers had to solely dependent upon their concerned companies for seeds and marketing of produce. Thus, the contract design of any firm plays an important role to make its contract farming successful for both parties. However, the company is more on safe side when there is no alternative market available in the state as they can exploit a farmers due to their monopsonistic nature, but at the same time, the company also do not have any another option to procure their raw material so to run processing plants, they have to procure the farmers' entire produce. Thus, the government can encourage farmers to get attach with agri-business firms by giving them knowledge through newspapers about assured income over the years. PepsiCo mainly worked with medium and large farmers, while RSL and Paras Spices Pvt. Ltd. was ready to work even on one acre land but preference given by them was also three acres to choose farmers. But, some of the small and marginal farmers themselves also did not feel confident for entering in contract with private firms as they felt risky about them as there was no role of any government agencies in contract practices. All the three surveyed firms worked independently without any government involvement as the implementation of Punjab Contract Farming Act, 2013 is still pending. Thus, the study indicates some critical issues in the direct contract farming implementation that need immediate attention of policy makers. The major suggestions to facilitate agrarian transformation in the presence of the contract farming system are outlined as under:

1. **Inclusion of small and marginal farmers in contracts**

The contract crop acreage restriction per farmer by the MNC restricted the participation of marginal, small and even semi-medium farmers. The biasedness in favour of medium and large farmers will perpetuate the practice of reverse tenancy in state, where contract farmers leased-in land from marginal and small farmers. For the long term perspective in terms of intervention in agricultural markets, the inclusion of small and marginal farmers cannot be ignored in contract practice as around 34 per cent of the farmers in Punjab and 84 per cent in India belonged to this category. The small farmers have tremendous potential to achieve higher returns from the cultivation of vegetables (Birthal *et al*., 2007a). The participation of small and marginal farmers can be ensured by encouraging farmers groups as was the case in Thailand, where potato growers have contract groups, which also deal with MNC on behalf of its members (Singh, 2005b). It will also reduce the transaction costs of the contracting firms in dealing with too many small farmers. The participation of the small farmers can also be ensured by imposing a pre-condition with the involvement of government agency to include certain proportion of small and marginal farmers in contract.

2. **Intervention of public agencies**

All the three contracting firms provided their own package of practices in order to get the crops of desired quality. The companies were involved in promotion of pre-selected crops rather than the overall rural development. The intervention of public agencies such as agriculture departments and extension departments of universities can strengthen the existing system of growing only few crops under contract by promoting other vegetable crops that also remain in demand. The farmers did not feel much confident in working with private companies due to lack of trust. The involvement of the public agencies will not only help to build the confidence with the private companies, but development of the agri-business firms can also be stimulated.

3. Bringing transparency and modifications in existing contracts

I. Transparent price fixation mechanism for the contracted crops

Undoubtedly, contracting firms have specified prices in contracts, but in actual practice, farmers pointed out that prices paid by the company are low with respect to grade of the produce supplied to the company and input costs of the contracted crops. Thus, a transparent pricing structure must be evolved and mentioned in the contract so that the farmers do not feel cheated by the company.

II. Specification of pesticide and weedicide usage in contracts

The two firms, RSL and Paras Spices Pvt. Ltd. do not recommend any weedicide for contracted crops, which are new for the farmers. They are also not aware of any weedicide. As a result, manual weeding cost in sugarbeet and chicory is quite high (₹ 6592/acre and ₹ 7420/acre respectively). Similarly, PepsiCo provides incentive for the chemical kit purchased from Bayer, which points that the company promotes sale of other agri-input company rather than enhancing farmers' welfare. Many a times, chemicals in the kit also remain un-used. Thus, the contracting companies should specify quality and quantity of the pesticides and weedicides to be used in contracted crops in contract agreement with the farmers. It can bring down cost of the production of the contracted crops and result in increase in net returns of the farmers.

III. Registration of contracts

All the three firms had unregistered contract agreement with the farmers. In case of any dispute, farmers do not have any option to take any action against the firm. RSL delayed payments of some of the farmers for more than 2-3 months during 2014-15 season and as a result, many farmers walk out of the contract for next season. Moreover, the company do not specify in its agreement regarding the payment of the produce. Such malpractices can be reduced if the firms are registered with some government agency such as marketing committee.

IV. Covering weather insurance

Two domestic contracting firms do not mention anything about the crop loss in the event of bad weather conditions, while the MNC has specifically written in its contract that in case of any weather related contingency, the firm is not at all responsible for the crop. Thus, the firms are not willing to share production risk of the farmers. The coverage of such insurance in the contract will facilitate the farmers' participation and will also help to build a long term linkage with the contracting firms.

4. Increasing competition among agri-business firms

RSL and Paras Spices Pvt. Ltd. worked with the farmers only in the vicinity of their company's location due to perishable nature of crops and high transaction costs. The quality of sugarbeet and chicory deteriorates within 24 hours thus; its delivery is not possible in such a short time span from far away regions. Ultimately, they exclude the farmers of other districts from the contract farming. But, there is also need for such firms in other districts of the state to promote region specific crops to bring the desired level of diversification. It will also increase the bargaining power of the farmers while selling the produce as the competition among firms will increase.

5. Diversification through sustainability of farming sector

The results of the study reveal that the existing agri-business firms promote only *rabi* contract crops. There is also a need of some agri-business firms, which also promote production and procurement of *kharif* crops so that the diversification away from paddy crop becomes possible. No doubt, the Punjab Contract Farming Act, 2013 brings 108 crops under its purview but the international experience shows that contract farming does not seems to be successful in basic field crops. However, to make contract farming successful, the selection of crops for cultivation under contract required pragmatic approach as the less perishable crops seems to be unprofitable for the contracting firms (World Bank, 2003).

9.12 Scope for Future Research

Due to paucity of time and financial constraints, some issues remain uninvestigated in this study. Some areas of research under contract farming, which can be explored in future, are outlined as under:

- The environmental impact of these new contract crops on groundwater and soil fertility needs to be explored over a period of time.
- It also needs to be explored whether contracting firms play any role in reducing indebtedness among farmers or not?
- The study explores that contract farming has increased employment opportunities for the labourers, but whether their working conditions have improved due to more work opportunities or not, needs to be explored.