

Chapter 8

Conclusion and Recommendations

The findings and the analyses of the study revealed that the productivity of contract farmers were higher than ex-contract and non-contract farmers. Although, the direct cost of production of contract farmers was 6% and 9% higher than ex-contract and non-contract farmers but, the gross margin was 19.5% higher than ex-contract and non-contract farmers. The returns to land from contract farmers were also 67.7% higher than ex-contract and 63% higher than the non-contract farmers. It was also found that the average auction yard price of ware potato was 3.86% more than the average farm-gate price of seed potato. The percentage of quality seed produced by contract farmers was higher than the ex-contract and non-contract farmers.

The study also revealed that the farmers were restricted by the cash and carry system to join the contract seed production program. There was indication on possibilities to form grower's group which will help in better management for collection and delivery of contract farming seed system.

8.1 Conclusion

The study revealed that seed is one of the most important and cost efficient means to sustainable increase in agricultural production. Reliable supply of good quality seed is crucial to potato production. No aspect of growing potatoes is more important than the selection of best possible planting material. It is highly probable that the low average yield of potato ($11.470 \text{ mt ha}^{-1}$) in Bhutan compared to the South Asian regional yields with similar agro-ecological zones can be attributed to the use of poor quality seeds and poor technical practices.

Bhutan has a serviceable formal seed system in place even though majority of the potato growers depend on the informal system. From the analysis, one of the main shortcomings of the current system is the serious gap in communication within the

seed potato system. Coordination among the key players in production and marketing are particularly problematic which raise the questions of future performance of the system.

The advancement of seed technology, particularly the tissue culture techniques, coupled with government subsidies has created enormous opportunities for farmers to produce disease free seeds. However, the adoption rate of certified seed potato and farmers growing potato for seed purposes has remained very low. It is due to inadequate technical information dissemination, limited access to supply of basic seeds and reliable seed potato market information. Availability of technical and market information will guide the growers and traders in making sound decisions pertaining to their production and marketing decisions. A range of institutional and organizational impediments has impaired the ability to significantly improve the quality and the adoption rate of quality seed potato. Thus, majority of the seed used is sought from the informal seed system.

Out of nine SPGGs started by the BNPP to take up quality seed potato production and marketing, only 5 are currently functional and their continuation as groups and financial sustainability is a concern. Poor management, coordination and cooperation among key players, inadequate finance and logistical problems have contributed to the failure of the formal seed programs to increase production and supply quality seed to the potato growers.

There is high potential for improving the seed potato production and distribution system. More so because potato readily fits into the cereal based cropping system in high altitude of the country. There are also high opportunities for increasing seed potatoes both for domestic and export market (West Bengal and Assam). One of the advantages of the Bhutanese seed potato over the Indian seeds could be the low rate of seed degeneration. In addition the seed potatoes produced in Bhutan (temperate region) are relatively free from diseases and less susceptible to infection.

Through promotion of seed potato technology, seed potato production could be enhanced. Seed potato system growth will be limited unless the linkages between the key players are strengthened, and services provided by the support sectors are streamlined with clear roles and mandates.

It is evident from the study that contract potato seed production operated by DSC has a definite advantage in terms of enhancing potato production. The approaches of contracting seed potato production initiated by BNPP in early 80s have left behind great impact in the field.

There are clear indications of scopes to make contract seed potato production program sustainable. The increasing demand for quality seed, lack of adequate resources with DSC, expanded market and increased area appropriately provides opportunity for contract production system. To ease the pressure on seed potato, contract seed production system could be used as a way of providing easier access to credit, input, information and technology and product markets for the small-scale farming. With the emphasis on production and marketing as a means to improve rural livelihood, contract seed production systems can be mainstreamed within the sectoral development strategies. Contract farming might also be seen as a way or as a part of rural development. It is revealed that use of DSC seed will help in increasing potato production; however seed tuber price could be a limitation for farmer to recycle their seed stock in shorter intervals. Farmers are adequately aware of the crop production guidelines, crop standards and roughing.

It is also apparent that contract seed production generates higher economic benefits compared to non-contract farmers. The assured market, subsidized transport and reliable price are one of the vital incentives for contract seed growers.

Although it appears advantageous for farmers to participate in contract seed production program, it is beyond doubt that there exist many problems that is hampering rapid development of potato.

8.2 Recommendations to improve the seed potato system

1. It is inevitable that the problems impounding the development of seed production sector should be solved. If some of critical problems such as input supply, credit, price fixation and crop predation by wild animal are adequately addressed, seed potato production in Bhutan can be increased by many folds.
2. Prices for the certified seed potato grown by the contract seed growers should be based on the market price and cost of production. The price must be higher for the quality seed and can be fixed as per the experience of earlier year. The price should be fixed and announced in advance rather than fixing on the average auction yard price.
3. DSC should form the Contract Seed Growers into groups rather than dealing at the individual level thereby spreading the scarce resource thinly over space and time.
4. It is also vital to increase awareness among the farmers that contract seed production program is a mutually beneficial venture to both DSC and the farmers. The involvement of Agricultural Extension network and Kuensel – the National Newspaper, BBS – Bhutan Broadcasting service will rapidly increase the awareness of the program.
5. Research (or study) on contract farming should continue as it is a continually evolving process, any findings will help in improving the system.
6. DSC should work towards improving the accessibility and the quality of all categories of seeds through regular monitoring of seed crop, provision of technical support and increasing the number of Contract Seed Growers.
7. Seed Potato Grower Groups (SPGGs) in the eastern Bhutan should work together with DSC and function as Contract Seed Grower Groups (CSGGs).

8. Train the BAFRA seed inspectors and extension officers in seed potato production guidelines, standards, and certification process to enhance the quality of seed potato.
9. DSC must draw formal contracts with the Contract Seed Growers Group (CSGGs), which will address the needs of both the parties and lessens future complications and uncertainties.
10. For successful implementation of contract farming, coordination, collaboration, and organized operation among the stakeholders need to be improved.
11. There should be a relevant and an efficient legal framework and a system established to ensure proper implementation of contract farming.
12. For the long-term success of contract seed production, relevant agencies should ensure long-term commitment.

8.3 Suggested further research issues

Potato remains the single most important commodity produced and marketed by high altitude farmers in Bhutan and therefore it receives high importance in research and development programs of the Ministry of Agriculture. Since, the Bhutan Potato Development Program (BPDP) has started its activities from 2004. The BPDP can look into the issues which are of paramount importance for the development of seed sector. The main issues which deserve future research attention are:

1. Cooperative farming
2. Credit system
3. Marketing (auction system, export market)