SUMMARY AND CONCLUSIONS
Chapter 6

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Seed is the most important input in increasing productivity in agriculture. Inputs such as fertiliser, water, etc., help to realise the potential imbibed in seed. Recognising the need for a vibrant seed industry in order to augment agricultural production the Government of India initiated various policy measures over the years. Due to these initiatives seed production increased manifold in the last four decades. There are many public, private and co-operative seed companies operating in the country. However, seed production was consistently below requirements in most of the crops including such important cereal crops such as wheat and paddy. The compound growth rate was negative for many crops in the past ten years indicating production is not heading towards matching requirements. Therefore, seed production needs to be accelerated in order to meet the requirements. However, there are many problems faced by the seed companies in increasing production, one of which is how to induce more farmers to adopt seed production activity and sustain their interest.
Seed companies in India cannot own large tracts of land due to land ceiling legislation. Therefore, they have to rely on individual farmers for producing seeds for them. The company supplies the foundation seed to the farmer, their officials make periodic visit to his field to ensure that he follows the recommended practices. The seed companies offer higher price for seed crop compared to commercial crop to induce farmers to take up seed production. However, cost of production is higher than that of commercial crop further seed production is prone to higher risk. As cost of cultivation is higher, failure of seed crop would mean heavy loss to the farmers. Therefore, the price offered to the farmers should be sufficiently high to offset the cost and risk associated with the activity and still leaves him more profits than had he cultivated other crops.

The question then emerges, is profitability of an activity alone enough to induce farmers to take up the activity? Are there other factors such as personal, social, etc., which also play an important role in explaining adoption behaviour of farmers? Although the economic profitability of a practice is a powerful incentive, it does not solely determine the decision of a farmer to adopt or reject a practice.
The study was undertaken to understand the factors that make some farmers to adopt seed production activity and others not. The study was conducted in Idar taluka, Sabarkantha district, of Gujarat. Castor seed, one of the important hybrid seeds produced under certified seed programme in the state, was taken up to study the adoption behaviour of the farmers with regard to seed production activity.

Farmers in the selected area were growing a wide variety of crops. Castor seed was cultivated between August and February, apart from castor commercial crop the competing crops for the same land for that duration were cotton, tur and a combination of maize and wheat. Adoption of any economic activity not only depends on the profitability of the activity but also on the opportunity cost of the resources, that is, the relative profitability of the alternative use of the resources. Hence, the cost and returns of castor seed was compared with not only castor commercial crop but also with cotton, tur and the combination of maize and wheat.

Labour requirement for castor seed was 46.15 per cent higher than castor commercial cultivation. Operations like weeding,
application of fertiliser and farm yard manure; and harvesting and threshing were done more intensively in seed production and hence additional labour was used in these activities. Further, activities like rouging and grading are done for seed production alone and they require more labour to be used.

With regard to material inputs, foundation seed used in seed production was costlier than the seed used for commercial crop. Further, more fertiliser was used for seed crop than commercial crop. They contribute to higher cost of cultivation. Seed produced had to go through various tests before it was certified, the farmer had to pay certification charges to the certification authority for the seed crop. Transport cost was higher in seed compared to commercial crop as it was the farmer’s responsibility to deliver the seed at the processing plant of the company whereas commercial crop may be disposed off in the village or nearby town.

Additional labour, inputs, certification charges and transport cost contributed to the higher cost of cultivation of castor seed crop compared to castor commercial crop. Cost of cultivation of castor seed was 35.36 per cent higher than
the castor commercial crop. Among the competing crops the cost of cultivation was highest for cotton. Wheat and maize together accounted for 35.99 per cent higher cost of cultivation than castor seed cultivation.

The yield of castor seed crop was lower compared to castor commercial crop. The yield of castor seed was 2.4 quintals per acre whereas it was 9 quintals for commercial crop. Around forty per cent of flowers were removed as offtypes which was the major reason for the lower yield of the seed crop.

The lower yield in castor was offset by the price. Castor seed price was three and half times higher to castor commercial crop. The price of castor seed per quintal was Rs 3800 whereas it was Rs 1050 per quintal in case of castor commercial crop.

Castor seed cultivation was 49.64 per cent more profitable to castor commercial crop. 44.26 per cent more profitable to cotton and 73.28 per cent to tur. When compared with the combination of wheat and maize castor seed was 7.5 per cent more profitable.
Though castor seed is profitable its production is risky. The coefficient of variation for yield of castor seed was 46.79 per cent where as it ranged from 14-16.9 per cent for other competing crops.

Though seed production is profitable only few farmers took up the activity. What are the factors that make some adopters and others non-adopters of the activity? A multivariate probit model was formulated to examine the factors that influence the adoption behaviour of the farmer.

Farm size, percentage of area irrigated to total area owned, family size, education of household head, secondary occupation, social status were the factors believed to influence the adoption behaviour of the farmers. The model classified 89 per cent of cases correctly.

All the variables except the social status had a positive sign. The loglikelihood ratio test was significant at 1 per cent level indicating that the variables taken together explain the adoption behaviour of the farmers. It was found an average farmer with the characteristics found in the model had a 90.48 per cent chance or probability of adopting the seed production activity.
Irrigation and education of household head were found to have a close relationship with adoption behaviour. A hundred per cent irrigated area was found to increase the probability of adoption of the activity by 22 per cent. An improvement in the literacy level of the farmers by two years increased the adoption by 6 per cent. If both irrigation and educational level were improved simultaneously the probability of adoption goes as high as 96 per cent.

Among the adopted farmers the yield of seed was found to vary considerably. Farm size, size of the family, experience of the farmer, education of the household head, secondary occupation and number of irrigation for the crop were believed to influence the yield of the seed crop. An ordinary least square method was used to find the influence of these factors on yield. All the variables had expected positive sign.

Number of irrigation given to the seed crop, experience of the farmer in seed production activity, the educational level of the household head and the size of the family were the variables that significantly affected yield.
Policy Implications

Seed production is consistently below requirements in most of the major crops in the country. Hence, there is an urgent need to augment production. One way of doing this is to encourage more farmers to take up the activity.

Irrigation and educational level of the household head significantly affected adoption. Improving irrigation facilities is important. In areas where there is no assured irrigation like canals, dams etc., farmers must be encouraged to invest in wells and tubewells. Though credit is available through institutional sources few farmers could afford that. Therefore, concessional interest rate, easy repayment schedule etc. need to be introduced to encourage more farmers to invest in irrigation facilities. Wherever feasible public investment must be made in major and minor irrigation projects by the government. An assured irrigation would induce more farmers to adopt the activity.

Education level of the household head is another important factor that affected adoption. The overall literacy level of the farmers must be improved to ensure more farmers adopt seed production. Improving formal education is long term policy, to encourage farmers in the short run informal
education must be extended may be through National Literacy Mission of the Government of India. Further, other ways of learning about seed production such as more contact by extension workers with farmers would be a better alternative to improve adoption of the activity by the farmers.

Improving irrigation and education level are long term strategy to improve adoption of seed production by the farmers thereby increasing production. However, in the short run seed production has to be increased with existing farmers. The yield of seed crop was significantly affected by number of irrigation, experience of the farmers in the seed activity and family size. Therefore, company/corporation officials should identify and approach such farmers who have good irrigation facilities, have sufficient experience in seed production and have family labour while organising production. When more such farmers take up seed production the overall production could be improved to some extent in the short term. Further, it helps the seed companies to better utilise their manpower in supervising production as sufficient quantity of seed can be produced with less number of farmers which would help to bring down administrative cost for the companies.