Chapter 8

Conclusions, Recommendations and Limitations

Radical innovations have the potential to create and revolutionize markets and demand. They are discontinuous technological innovations which have high switching costs and uncertainties linked to their adoption. Factors affecting adoption of innovations gain extra weightage in case of radically innovative products. These factors generally relate to the political, geographic, social, technological and marketing environments. In addition to these, the characteristics of the potential market segment also have an impact on the adoption of innovations. These factors act at the global level and determine the adoption of the technology by a particular country. At local and national level these factors influence the speed of its diffusion of innovation. This study has focused upon GM crop innovations with special emphasis on GM cotton. The study reveals the importance of marketing strategy as a key driver for adoption and diffusion of innovations.

A conceptual model was formulated to depict the factors affecting adoption and diffusion of the technology. These factors pertaining to the external environment were grouped into the characteristics of the target market, external environmental variables and other publics or stakeholders which have an important bearing on the adoption and diffusion of innovations. The need for building up all these factors into the marketing strategy for innovations was emphasized. To highlight this point further, some of the case studies on innovative products were discussed. The products studied were- ART (Assisted Reproductive Technologies) industry in India, cosmetic surgery and GM crops. Out of these the case of GM crops was discussed in detail. In order to arrive at the factors affecting GM crops adoption, survey of literature was carried out. These factors were then analyzed through primary and secondary data survey. Primary data survey was conducted in three cotton producing states across the northern zone of the country. It was implemented through fully structured questionnaire and covered a period of three months. It tested/yielded a number of factors that pertain to the demographics, psychographic, economic characteristics of the target market customers and looked into the perception of the market towards the marketing strategy elements adopted to promote Bt cotton in
those areas. Secondary data survey was carried out through various research articles, websites and newspapers and a major data sources-ISAAA Briefs 1991-2011 and Cotton Corporation of India-Reports were harnessed. To arrive at the impact of environmental factors affecting the spread and adoption of GM cotton (especially Bt cotton) in India, secondary survey was carried out. It involved zonal analysis for the spread of cotton since the launch of Bt technology in the country. The marketing factors affecting the spread were studied through tracing the Product Life Cycle (PLC) of the technology in the country.

Study concluded that there are a number of variables like legal, political, social, economic, technological and geographic which pertain to the environment in which the GM cotton technology was introduced. But in all of these factors, the impact of legal and political environment seems to be the most significant.

Primary survey revealed the importance of marketing strategy elements-product, price, place and promotion in determining the adoption of the technology in the country. Further, it pinpointed the effect of performance related variables like overall low costs of cultivation, the expectation of higher yield and low requirement of pesticides as the major motivators in adoption of Bt cotton. It also emphasized upon Word of Mouth, Agricultural area development officers and the Company Representatives in spreading awareness and initiating the trial for the technology. It highlighted the role of channel partners (dealers of seeds, fertilizers and pesticides etc) in providing loans for the cultivation.

The conclusions from the study are detailed as-

1. Legal and political environment is not only the first interface of an innovation but a major driving or resisting force in its adoption. Though the advent of the technology is generally affected by the private players, its sustenance, growth, acceptance and diffusion is a product of continuous interactions between the private players and the government. Government can resolve the uncertainty regarding the innovation and its consequences which assumes importance and pose hurdles in its adoption diffusion process.
2. Social environment exerts pressure on the adoption of innovations. It may positively propel the innovation through social networks and opinion leadership or hinder it through protest and demonstrations. Further, the reactions generated by radical innovations turn adverse due to the presence of multiple stakeholders. Hence it is required to satisfy the stakeholder and publics involved and to address their concerns confidently.

3. Economic environment of a country determines the adoption of a radical innovation. The royalty charged by the technology developer needs to be decided according to the economic status of that particular country where it intends to enter. Price points are also decided on the basis of market affordability.

4. Marketing and technological environments too help in deciding whether a country will adopt an innovation or not. The increase in the number of companies, varieties and features of the innovative products help to increase the customer’s confidence and improves its performance at the national level. The greater advancements in technology help in development of markets which further facilitates the adoption and diffusion of the technology.

5. Geographic environment generally impacts the agricultural innovations. It acts at the local level and determines the final outcome of the technology. Performance of the technology is affected by this environmental variable and helps in generating a positive or negative sentiment about it.

6. The major factors at the adopter level which have an impact on the innovation adoption are his demographic, psychographic and economic characteristics.

Marketing strategy can facilitate the adoption of innovation by building upon the factors which affect it. Marketing strategy elements need to be adapted according to the laws of countries, economic conditions of its potential adopters, geographic conditions of local areas inside the nations and the extent of competition generated by the market. This study analyzes how the hurdles have been overcome in various countries especially in India by designing marketing strategy around these factors.
Marketing strategy serves to educate the market about the new technology before they themselves render a judgment or intention to buy or not buy it. This is important because radical innovations are complex products possessing attributes with which market is unfamiliar. Hence there is a severity of learning requirement in case of radical innovations. The market, which consists of all the stakeholders, lacks knowledge to evaluate and make judgments regarding these products. This gap is fulfilled by the promotional strategy for innovations.

Marketing strategy needs to be supported by the performance of the product because it is the Word of mouth which emerges out as the most important source for spreading awareness and generating trial by the potential market. Positive word of mouth can only be generated if the innovation confirms to the adopter’s expectations. Moreover, by creating and promoting the differential advantage generated by the technology, marketing strategy can boost this word of mouth.

Marketing strategy is a must for the proliferation of the technology also. The developer of the technology should make it convenient for the other players to enter into the market keeping the profit margins and his sunk costs in the mind. It will help to increase the rate of adoption of the technology because as the number of players increases there is a greater market development due to pooling of resources. This pushes the demand in the market and aids in developing customized features and varieties of the product. The competition also helps in reducing overall cost of the market and the price of the product for the customer. This helps in better adoption and penetration of the technology amongst the masses. In this study, the high price of Bt cotton was seen as a major reason for its non adoption. However, the newer technological modifications helped in making the technology more acceptable to the masses in terms of lower price and customized features.

In short, all the elements of marketing strategy-product, price, place and promotion must act cohesively to spell success in the marketplace. The study also pointed towards the concerns made by the farmers regarding its high price and low availability. Hence the
marketing strategy elements should be customized to provide-value for money, time and space utility for the customers.

**Limitations of the study-**

Primary survey was a single handed effort on the part of researcher and was carried out as a part of Ph.D. program. Due to these reasons it faced the paucity of resources and time. Hence the study was confined to the few villages across northern cotton producing zone of the country and the sample size was relatively small as compared to the entire population.

A major problem was of no response or lack of response by the respondents which limited the information availability and presented a constraint for using sophisticated statistical techniques. Moreover, despite the fact that results are based on statistical analysis, the possibility of personal bias may not be ruled out completely.

Secondary data were obtained from the best available sources but the authenticity of the data could not be cross checked.

However, to the best of my knowledge, this is the first comprehensive study made on adoption, diffusion and marketing of Bt cotton in Indian context. This study can be further improved through analysis on wider sample and use of sophisticated statistical techniques to achieve robust results. Moreover, the analysis of company specific factors that affect the marketing strategy of innovations can further enrich the study. It is planned to carry this study to the next level in the near future.