CHAPTER - X

REMARKS

10.1 SUMMARY

Chapter-I gives a compact and precise introduction of the work done in the thesis focusing on purpose and methodology of this study. It explains the concept of market segmentation in general and its utility in strategic marketing decisions. It delves much more deeply into segmentation strategies and turning segmentation into profit. The marketers' quest for revenue-generating objective differentiation of market and thereby solidify customer loyalty has become a top priority for today's utilities. The winners in the emerging competitive marketplace must begin thinking of their customers in segmented market niches that can be penetrated using target marketing methods. The utility of mathematical programming models to optimally match the competition and products with the demographics of target market segments. It then highlights the significance of decision systems approach and market segmentation strategy in application of marketing philosophies and techniques. The proposed mathematical programming techniques for solving "multi-criteria decision system" with multiple, conflicting and non-commensurable objectives has been discussed in brief. The research methodology has been presented along with a brief description of the study area and dairy industry in India as well as in Keonjhar district of Orissa.

Chapter-II provides a brief and compact overview of market segmentation in general. This gives a close look to the basic concept of market segmentation and also covers requirements for operationally meaningful market segmentation and various basis of segmentation has been described with the reference to different authors. The basis of segmentation covered are demographic, geographic and behavioural. Also, a brief review and quantitative techniques used in market segmentation have been well presented in chapter-III. This gives an insight in quantitative modelling techniques to real life problems. It helps to arouse interest among the decision makers. It has been observed that a wide range of mathematical modelling techniques has already been applied in the market segmentation analysis. At the same time, it throws light on the future applicability of those techniques into the market segmentation area. Chapter-IV depicts brief a review of mathematical programming techniques. This chapter reviews about various mathematical programming problems, their mathematical properties, the development and implementation of algorithms to solve the problem, and various applications of the algorithms to real world problems.

Five market segmentation decision system models along with five algorithms for solving the problems have been well discussed in Chapter-V, VI, VII, VIII and IX. These five market segmentation decision systems are based on
marketing problems such as marketing channels, advertising budget allocation, package design, pricing and retail outlet location. The algorithms applied to these market segmentation problems are efficient in tackling multi-criteria decision systems with multiple, conflicting, non-commensurable criteria. Modelling for market segmentation decision system-I starts with “marketing channels” as described in Chapter-V. The model selects the optimum level of marketing channels to cater dairy products to target market segments based on types of level of marketing channels, geographic segments, dairy products, seasonal variation, income level, household size and usage rate segments. The objectives of model are profit maximisation, cost minimisation and customer goodwill maximisation. And the model have various system constraints, viz., budget constraint, preferential constraint, competitors constraint, area constraint, exclusive channel level market segment constraint, channel level limitation constraint, brand share constraint, return on investment constraint, stock turn-over constraint and minimum selectivity constraint. The algorithm used to solve the problem is based on an fuzzy multi-objective programming technique with interactive procedure and min operator. And, the result found are well suited to the market segment selection to specific marketing channel levels.

Chapter-VI describes the market segmentation decision system-II based on advertising budget allocation. The study is to allocate optimally of local advertising budget over different geographic market segments and media vehicles in a given time period. The objectives are of maximum profit, minimum cost and maximum exposure with various system constraints. The system constraints are budget constraint, non-overlapping constraint, preferential constraint, competitors constraint, geographic constraint and minimum selectivity constraint. An algorithm of fuzzy multi-objective de-novo technique based on interactive manner with min and additive aggregation operators has been applied. The result found to be interesting and applicable to dairy product advertising budget allocation to local geographic segments and to media vehicles.

Chapter-VII discusses the market segmentation decision system-III based on package design. The study is to determine which package design will be the best sales tool for dairy product in particular market segment. The objectives are of maximum profit, minimisation of cost and maximisation of sales appeal with various system constraints. The system constraints are budget constraint, package design constraint, preferential constraint, minimum selectivity and competitive advantage constraint, area constraint, package design non-compatibility constraint and market share constraint. An algorithm of interactive fuzzy multi-objective programming technique with additive operator has been implemented. From this research, we are able to identify the current package design in demand and to target specific market segments for improvement in the dairy products packaging design. And this also helps to
increase dairy product appeal and its image among current and potential customers.

Chapter-VIII introduces the market segmentation decision system-IV based on pricing decision. This research is designed to illustrate the determination of appropriate price of the dairy products to the different market segments. The objective are of maximum market share and minimum price variation with various system constraints. The system constraints are market share constraint, price restriction based on marketing channel, price restriction due to demand supply trade-off, variable pricing constraint, geographic restriction, product quality restrictions and ethical constraint. A fuzzy multi-objective programming technique with additive aggregation operator has been utilised for the purpose. From this research, prices of the dairy product to the different market segments has been determined.

Chapter-IX discusses the market segmentation decision system-V based on retail outlet location decision. The study is to determine which retail outlet location site to be best sales centre for dairy product in the particular market segment. The objectives are of maximum profit, minimum cost and maximum customer satisfaction with various system constraints. The system constraints are budget constraint, exclusive retail outlet for market segment constraint, retail outlet limitation constraint, geographic constraint, market share constraint, minimum selectivity and competitive advantage constraint, customer satisfaction level constraint and revenue generating constraint. A fuzzy multi-objective programming tool utilising piecewise linear membership function and a “min” aggregation operator has been employed for solving the problem. The new retail outlet location site which is most critical decision factor to any marketing manager can be solved by this technique.

Hence, this dissertation has presented some market segmentation decision systems based on certain marketing problems such as marketing channels selection, advertising budget allocation, package design selection, pricing determination and retail outlet location decision.

10.2 SCOPE FOR FURTHER RESEARCH

This dissertation is primarily based on the application of multi-objective decision systems to marketing problems. The five decision systems which has been discussed so far has two components viz., (i) implementation of the concept of market segmentation to marketing management problem ; (ii) utilisation of multi-objective decision making tools for modelling such problems, so, that those can be solved by using the present day computers. In this work five generalised multi-objective marketing decision systems have been developed taking into consideration the entire Keonjhar district whereas implementation of these models are done based on case study for a part of the district. The results obtained from the case study reveals the fact that the
generalised models can also be implemented for getting the desired solutions. Hence, the crux of the thesis depends on two important techniques viz., market segmentation and multi-criteria decision systems.

The multi-objective decision systems which have been developed in the thesis are solved by employing the concept of fuzzy mathematical programming. These decision systems have two components viz., set of objectives and set of constraints. But this work can be extended to such a form where the objectives are replaced by goals having priority structures and suitable weights attached to various goals in each priority level. More user-friendly decision support systems can also be developed taking these models in the model base of the system. Even rule based expert systems have a greater scope for implementing such systems as the whole systems can be decomposed into various rules. Hence, unstructured decision making can also be incorporated in the decision environment where the judgement of the decision maker takes priority over structured decision making.

As, this work involves the application of multi-objective decision-making as well as multi-objective system design approaches to segmentation techniques in general and to various marketing problem in dairy management in particular, several other applications can be successfully done in the similar manner. Though, non-linearity of the membership functions for the objectives have been considered through piecewise membership functions, non-linear objective functions can also be taken as the extension of the work. At the sametime, various application of multi-stage dynamic programming can also be considered.

All these problems discussed in the thesis are basically precise objective functions and fuzzy logic approach has been utilised to constraint the satisfaction function of the DM either linearly or non-linearly. But, it might so happen that some of the objectives may involve stochastic as well fuzzy parameters. This may also happen in case of constraints. In that case, the criterion may be may be termed as either stochastic criteria or fuzzy criteria. Appropriate algorithms should be utilised for tackling such type of decision systems which are quite obvious in the real life cases.

On the whole, the complexity of the decision-making process in marketing management area can be handled through various fuzzy mathematical programming techniques quite efficiently. The rigidity of the modelling approach for the real life cases can be minimised through the application of fuzzy logic which has found it’s way in all-most all the areas of human knowledge. Hence, marketing management area can never remain as an exception and more analytical and application-based studies can be brought to it’s domain for efficient marketing decision-making process.