Chapter 7

Summary of Findings

Conclusion and Recommendations

In this chapter, an attempt is made to draw attention to the major findings of the study. These findings are expected to act as guidelines for framing the public policies that are to be adopted, so as to accelerate the development of Ayurvedic industry in Kerala.

7.1 Findings of the Study

The important findings of the study are mentioned below.

7.1.1 Evolution of Ayurveda

It is found that the evolution of Ayurvedic industry can be categorised into three distinct phases viz. phase of familial domination, phase of institutionalisation and phase of universalisation. During the first phase the entire knowledge was in the hands of a particular family or caste and the system remained stagnant because of the secretive nature of the family members. This realisation lead to the establishment of Ayurveda colleges and recognised the need for registered practitioners. It was found that Ayurveda got ample space to flourish during this phase of institutionalism. The phase of universalisation began with the growing disappointment with the Western medicine, its increasing side effects and above all the power of Ayurveda to treat the root of illness.

The universalisation of Ayurveda led to the increase in the export and import volume of medicinal plants whereas the value of export and import declined. The European Union has emerged as the largest importer of Ayurvedic medicines from India followed by Germany.
7.1.2 Nature and Growth of Ayurvedic Medicine Manufacturing Industry

There were 7621 Ayurvedic medicine manufacturing units in India with largest number of units in Uttar Pradesh followed by Kerala in 2007 – 08. Kerala accounts for 16 percent of the total Ayurvedic medicine manufacturing units India. The examination of the nature of the industry in Kerala revealed that the industry is heavily concentrated in northern Kerala (48 percent of units). Ayurvedic industry had good linkage with the medicinal plant market, maintained excellent traditional legacy, and was dominated by private sector where there is the coexistence of large number of small and medium sized firms and a few large firms who contributed to the 90 percent of the total output. The study exposed that the Ayurvedic medicine manufacturing industry in the state had attained phenomenal growth over the years with regard to the number of registered units which increased from 516 in1998 to 1245 units in 2007. If the increase in the early days is attributed to the upcoming of large firms, the growth in the later period was due to the establishment of large number of small and medium sized firms. If we take three reference periods 1998–2001; 2001- 007 and 1998-2007 we find that the rate of increase in the number of firms has doubled during the first phase whereas the rate of growth declined from 446 to 233 firms in 2007. Similar trend is seen in the case of regional concentration of the firms, where there was a fall in the number of manufacturing units in southern and central parts of Kerala. However, the domination of units in the North Kerala continued significantly.

As a direct consequence of the increase in the registered manufacturing units the aggregate output, consumption of raw materials, number employed, sales turnover, has increased considerably. The increase in output was worked out to be 6.9 percent, raw material consumption at 7.9, labour employed has
grown at the rate of 6 and increase in sales was worked out to be 15.9 percent. There was a phenomenal shift in the production of Ayurvedic drugs from individual specific to mass production through the introduction of professionalism in Ayurvedic training, innovations in drug manufacturing and the adoption of certain manufacturing techniques for mass production.

7.1.3 Supply Chain Mechanism

The study showed that the medicinal plant market in Kerala is characterised by large scale irregularities, imperfections and extreme complexities with regard to quantity of medicinal plants traded, number of traders and value generated. The study revealed that there are three main supply chains in the trade of medicinal plants in Kerala–supply chain for fresh medicinal plants, buyer driven supply chain and government regulated supply chain under the Kerala State SC/ST Federation. The market for fresh medicinal plants was direct between the private trader and manufacturer. Buyer driven supply chain was found out to be the most popular chain with number of intermediaries ranging between four to five and it was estimated that the rate of exploitation of the primary collectors increased as we go up the chain. In the case of the third chain the number of intermediaries was less. The study found that there are approximately less than 100 private traders, 75 commission agents and less than 40 wholesalers. Thrissur, in North Kerala is the most dependent medicinal plant market by the manufacturers.

The estimation of differences in the price charged by the different intermediaries in the chain denoted that maximum economic gain in this trade went to the private traders. The price differentials between private trader and primary collector ranged between 25 to 48 percent where as it varied, 10 to 13 percent between private trader and commission agent, the next node in the chain. Thus, it is
estimated that maximum economic gain in the medicinal plants trade was made by the private trader and followed by the commission agent and final consumer. The primary collector was the most affected player in the trade. It was observed that the lack of information was the primary cause for their poor bargaining power. The comparison of the prices of selected medicinal plants sold by the private trader and by the Kerala State SC/ST Federation disclosed that the prices of the latter are heavily subsidised. The market margin varied from 13 to 85 percent. In spite of the price differences it was seen that major reasons for the widespread popularity of the buyer driven supply chain included the readiness of these sellers to supply the required quantity of medicinal plants in the factory premises in the right time, willingness to grant credit for 90 days, minimal procedures and formalities etc. This implied that institutional arrangements in the supply chain of the Federation have to be redirected to reap the above advantages.

7.1.4 Value Share Analysis

The per unit price of medicinal plants sold by the primary collector increased more than ten times the original price when it reached the final user. The share of the former in the price actually paid by the final consumer came to only 5-15 percent. The study showed that percentage of raw material cost in the total cost can be reduced from 42 percent to 19 percent, if the source of supply is altered from the private trader to the Federation. *Cetris Paribus*, the resultant reduction in price of the Ayurvedic medicines was found to be significant. The computation of the share of each player in the final price of the product showed that the share of the primary collector in the final price of the medicine was found to be marginal with less than five percent whereas that of the private trader varied between five to 15 percent. The
share of commission agent was found to be significant with more than 50 percent and finally the share of final consumer were estimated to be between 10 to 56 percent.

As in the case of the medicinal plants trade, the share of each player in the supply chain increased as we proceed up the chain. It is noticed here that the dominance of the private trader in the supply chain was not felt in the case of value share estimation. The manufacturers and commission agents went beyond the private trader in terms of the gains made. However, the relative position of the primary collector did not show any improvement. Primary collector is the major looser in the game. The estimation of the profit of the final consumer revealed that the manufacturer earned only normal profits. The improvements in profit can be made only if raw material cost is reduced which requires the designing the present supply chain.

7.1.5 Productivity Estimation

The partial productivity growth exposed some interesting fundamental insights. The result shows that only labour productivity showed increasing trend. The increase in the capital intensity did not support the growth of capital productivity. The firm wise estimation of partial productivity showed increasing rates for AVS, Oushadi and Nagarjuna. Whereas the rate of growth of capital productivity showed negative results for AVS and Oushadi. Capital intensity showed better rates for Nagarjuna. Total productivity estimation using the Kendrick index showed increasing trend for Nagarjuna alone. The variations seen in total factor productivity of the industry is reflected in the case of all three firms. This implies that growth of Ayurvedic industry in the state was mostly labour driven, where labour contributed significantly to the total output. The Neo-Classical Cobb-Douglas production function also substantiated this. Interestingly the contribution of capital to total
output has not been significant. The production function estimates for the industry as a whole also shows that the labour is the major component that determines the output. The under utilization of capital is very evident when we observe the values for capital coefficient.

**7.1.6 Functional Problems**

An understanding of the problems of the Ayurvedic industry pinpointed that medicinal plant scarcity pose to be the most challenging problem faced by the industry. Fall in the quality of medicinal plants is considered to be affecting the large sized firms where as the increase in cost of productions owing to scarcity obstruct the medium sized firms and finally the disappearance of medicinal plants from the factory surroundings threatens the existence of tiny and small manufacturers. The estimation of the capacity utilisation showed very disturbing trends for the industry. Majority of the units were characterised by poor capacity utilisation. Small firms showed better utilisation as they use only very less amounts of capital. The capacity utilisation results add support to the poor capital productivity trends.

The study showed that the industry in the State do not face any kind of labour unrest. Only five percent of the medium sized firms reported that they have labour problems, but not in any way affecting their production. But 85 percent of the small firms were of the opinion that they are not able to attract adequate number of labourers because of their unattractive wage payments. Besides these, it is found that changes in the consumer perspectives on Ayurvedic medicines, regulatory concerns such as Good Medicine Practices (GMP) and Intellectual Property Rights (IPR), issues related to globalisation, problem of standardization are disturbing the future prospects of the industry. Finally it is found that the problems faced by the
units irrespective of their size are same but the nature in which these problems affect each category of units are different.

7.2 Policy implications

1. Although Ayurvedic industry is 100 years old it has not grown in terms of the value of total output, sales turnover, capital intensity, development of patented and proprietary medicines, exports etc. No serious efforts are undertaken to codify the knowledge base of Ayurveda. Understanding the monetary wealth stored in this industry, many multinational companies have come forward to takeover reputed Ayurvedic firms. This shows that Ayurvedic industry in the state has a larger scope for future expansion. Hence, suitable strategies from the part of the government are essential for accelerating the pace of development.

2. Raw material scarcity poses to be the most important challenge faced by the industry. Suitable programmes for encouraging medicinal plant cultivation on a large scale have to be taken up.

3. The present design of the supply chain of medicinal plant trade in Kerala is faulty and it is extremely favouring the intermediaries. The regulatory authorities should take steps to curb the exploitation, which can be done by restructuring the mode of trade carried out by the Tribal Cooperative Societies (TCS).

4. The restructuring of the TCS will improve the capabilities of the primary collectors, profitability of the manufacturing units; and the reduction in the raw material cost will help to reduce the price of Ayurvedic medicines which will help to improve the health status of the people at large.
5. Sustained development of the Ayurvedic industry involves continued changes in the economic roles and capabilities of the various players in the supply chain of medicinal plants trade especially the primary gatherers.

6. Productivity study revealed that utilisation of capital has to be improved to attain better rates of growth and profits. This also necessitates that Ayurvedic industry should concentrate more on the production of more branded pharmaceutical formulations by using modern techniques.

7. To adhere to the W.T.O regulations and global standards, the government should establish an institution for evolving international quality standards and testing procedures.

8. Ayurvedic industry should concentrate more on patenting their proprietary medicines and government should take adequate steps to assist the industry.

9. Government should take steps to form a Repository to record the rich knowledge of traditional medicine inherited by many Ayurvedic manufactures which is at present not disclosed. Government should ensure that manufacturers are monetarily rewarded by this measure.

10. Necessary reforms, relaxations, and financial aids have to be given to the small and medium sized firms to encourage production. Government has to formulate necessary policies for the future growth of the AMMU’s by considering it as a potential source for the future growth of the state.

7.3 Contributions of the Study

The present study makes useful contribution to the researchers and policy makers. An extensive description of the evolution and growth of the Ayurvedic industry made by the researcher will add further insights to future researchers.
Studies on the value share analysis and price spread presents a strong evidence for the inherent inefficiencies in the industry. The proposed model of supply chain can help to rectify these weaknesses. The productivity estimates shows the need for greater modernization, value addition and capital investments.

Though there are several studies on the pharmaceutical, pharmacological characteristics, cultivation and collection of medicinal plants, very few studies have dealt upon the economic aspects of the industry. The present study is expected to bridge this gap.

7.4 Scope for Further Research

Many important areas such as productivity measurement of the industry, tracing of supply chain, estimation of the value share, calculation of the price spread are virtually unresearched in Kerala context. The present study is an initial attempt into these areas. Considering the present rate of growth of the industry in the State, the volume of research done is so inadequate and there is ample scope for further research.

7.5 Conclusion

The study reveals that Ayurvedic industry has undergone systematic transition over the years and is no more in its primitive stage. It can be very well treated as one of the most promising manufacturing sector in the State. The urge with which it has grown shows that the industry has ample strength within itself to reach even better heights. The development of the industry has accelerated the demand for medicinal plant trade which has grown into a profitable source of earning for many. The findings of the study has significant policy implications such that it will throw light on the present strengths and weaknesses of the industry and pinpoints various measures through which this can be rectified.