

CHAPTER 6: CONCLUSIONS, FINDINGS, RECOMMENDATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Among many renowned names used for Sri Lanka from the past ‘the Pearl in the Indian Ocean’ is very popular among the global nations. Most of such names were implying this heavenly country is a splendid, superior one. It is full of many natural resources which can be easily used in achieving the development of the country. The potential to grow almost any type of a plant within the natural conditions is one of the most vital aspects. If this agricultural sector contributes to the economy it will become a vital gift of nature. This kind of an impact is substantial and not privileged by most of the countries. Cinnamon plant has given this contribution from many centuries back for Sri Lanka. Therefore the importance of this study is maximized in improving the industrial technological aspects. Because the ultimate objective of this study is to convert Sri Lanka to a better country through obtaining the competitive edge in the Cinnamon industry.



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Concerning this aspect the first section of this chapter discusses the conclusions derived from the outcomes of the quantitative and qualitative analysis followed by the findings in detail. The next section details the policy recommendations to uplift the Cinnamon industry to a positive growth in a consistent manner. At last the direction for future research is discussed to support for future researchers in the related category.

6.1 Conclusions

Cinnamon industry in Sri Lanka is currently not performing to its maximum potential level. But the industry has a strong belief if the appropriate measures are under taken effectively, the industry could be carried towards a profitable venture with the minimum effort. It becomes a reasonable aspect, since the industry is native to Sri Lanka. Therefore simultaneous development of both the products and processes are crucial with the support of modern technological applications.

This research study revealed that there is a positive thinking and good hopes with regard to the industry growth potential. But the poor operational implementations become a real cause in many issues. In summarizing the research study it could be explored and drawn the following conclusions:

- The quantitative analysis revealed that the entire industry is in a positive perception and believes that the technological applications and marketing strategies are very much important aspects of the industry
- In the qualitative analysis, it was explained the importance of the application of operational aspects which could be generalized to the industry in increasing the Cinnamon yield. Further it explores the gravity of some key areas which give a high impact to the industry growth (e.g. Price sensitiveness of the export market under comparative conditions)
- The outcome of the statistical Factor analysis revealed most of the variables explained the contributors of the industry. Therefore it is a necessity to get the support in an appropriate manner in overcoming these focused industrial issues.
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- Correlations of the constructs *Technology Competency* and *Market Orientation* are significant for the variables defined as per the conceptual model. It indicates that there is a common understanding of the issues interrelated among each sector within the industry.
- The observations further emphasize, there are some related sectors that are comparatively performing well in the export market (The product range which incorporated Cinnamon as a raw material for many essential industries). If these products (Specially Cinnamon bark oil) could be manufactured while overcoming basic issues then it will be a great influence to perform more effectively in the export market.

6.2 Findings

Focused group discussions, direct interviews and indirect discussions were held with the stakeholders of the industry. But more concern was given to the value chain players in the Cinnamon industry. There were many important aspects found out regarding the entire activities of the industry. But the major important findings were discussed as follows:

- ❖ The final market price of the Cinnamon Quills is decided by the existing buyers at most of the time. Because these few buyers had developed high bargaining power over the situation and well organized to match the situation.

Since price is the major factor directly affecting the progress the current situation is discouraging them to stay in the industry. Because the low margins they receive will not be enough even for carrying out the next cycle of harvesting. Therefore it hinders the sustainable development of the industry as planned.

- ❖ These quills have a standard length (106.7 cm), weight (45kg) in order to facilitate the exporting process by being packed inside of a container. But these standards were also imposed by the importers to support their own processing activities in the next step of value addition which is not exposed to us. The importers therefore dislike the products being diversified by our value chain players since it becomes a problem for their existence.

- ❖ In the plantation sector one major issue is that most of the trees/ bushes are very old. Some are even more than few centuries years old. So it needs to be replanted with the assistance from the necessary institutes and incorporate the newly developed species of Cinnamon which provide increased yield.

- ❖ Most of the planters are fed up with the industry and keep away from the plantation. They do not pay their fullest concentration/ contribution due to the attitudes and/or poor opinions of the industry. This negative perception needs to

be changed immediately and convert the thinking pattern to a positive direction through motivating them.

- ❖ The supportive activities such as providing fertilizers at reasonable price, providing necessary irrigation arrangements, providing high tech processing centers to get a high quality product, consult the planters and related value chain players...etc. should be concerned and provide them as required.

- ❖ Traditionally Cinnamon is cultivated as a mono-crop in large holdings. At present about 90% of Cinnamon holdings are cultivating as a mono-crop .There is a possibility to carry out the intercropping cultivating method with Coconut for Cinnamon plantation and improve the revenue. About 10% of the holdings have Coconut as an intercrop, and in areas such as Ratnapura and Kalutara it was found cultivated with other types of perennial crops as well. Therefore most of the small and medium planters don't practice or not willing to practice this method as an alternative mechanism in the field. The reason is these planters were not fully educated on implementation of the intercropping cultivation methods and also it doesn't seem to suit the market need at their individual levels too. But most importantly it will improve the productivity of the land.

- ❖ Cinnamon processing steps concerns most of the traditional applications and practices which lead to deteriorate the quality and on the other hand increasing the cost. Especially the peeling process is taken place in a traditional manner with the involvement of intense labour resource. This process needs to be changed by incorporating the new technology. Although there are some new technological applications introduced and incorporated in the field, their viability needs to be evaluated for practical applicability, since most of the users dislike using some of them.

- ❖ Cinnamon leaf oil processing incorporates leaves that were left out after using for the distillation process. It is a productive firing material for the industry but the environmental pollution is at a very high level (Figure 6.1). Neighbours'

complaints have increased over this pollution problem and it needs a quick solution.



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Figure 6.1 : Environmental Pollution at Leaf Oil Stills

- ❖ There is a gap between the Research institutes & relevant authorities and planters & processing sector due to the lack of communication and confidence. This is mainly because of the poor understanding between those two parties.

Further some of the proposed research findings which are unsuitable and has become hard to implement in practice lead to develop the distrust towards them. As such the industry needs the assistance from research institutes in a high level with proper practical applications.

- ❖ It needs to have a continuous assessment for any technological application from time to time. It will help to maintain or upgrade the standard with the satisfactory improvements. This has not taken place for some applications on a regular basis and therefore the process efficiency has come down. The tools & equipment

associated with the processing process has not been upgraded since many years back.



Figure 6.2 : Set of Hand Tools used for Cinnamon Processing

- ❖ One important factor is the necessity of giving the correct status, recognition and prestige to the industry related employees. This social factor plays a major role in all levels not only to keep the current employees but also to get new generation involvement in the industry. This lack of recognition at the lower level will create scarcity of labour in the long run and there won't be any development. Some organizations have considered this aspect and have produced some Tele-dramas focusing on improving the recognition and changing the attitude within the society (Specially GP de Silva (Pvt.) Ltd.).

Although up to 35-50% of the sales revenue of finished products is paid as wages which is an above average rate compared with the market conditions, due to the social attitudes the younger generations of peelers don't not readily involve in the industry.

- ❖ Current product portfolio should be improved by incorporating more technological applications. In the mean time manufacturing of more value added products also should be focused to suit niche markets exist in local and global context. This is primarily a marketing issue faced by the industry since there is no any strategy to exploit new markets and even the customer needs. This is indeed a necessity if the industry wants to perform high and earn more returns.

- ❖ Cinnamon promotion activities are not incorporating Cinnamon brand development activities which affect positioning of Sri Lankan products in the global market. This will give resistance not only to cater up-end market segment but also to generate revenue from the high markups.

The government very recently launched ‘*Ceylon Cinnamon*’ brand promotion activities but it needs to be speed up and broaden.

- ❖ Lack of awareness creation activities and poor involvement in trade promotions to identify new market segments is another crucial aspect for the development of the industry (i.e.: more International trade fairs and advertising campaigns to promote True Cinnamon).

- ❖ Finding peeling labour with high skill is very difficult and on the other hand they demand very highly. This job was traditionally done by a special group of people and now that trend has been changed and social groups which are not traditional peelers are also carrying out the same. At times the skilled peelers scarcity seems to be a limiting factor in increasing Cinnamon production.



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- ❖ Cinnamon leaving the farm gate includes a high amount of moisture. That is the reason why all traders have to dry the product and grade them as necessary. This indicates that while the Cinnamon being transported along the trade channel, due to the presence of moisture it starts to deteriorate the quality. That type of quality degradation could not be improved to satisfactory level even after drying at the latter stages. Almost 40% of the volume will have to be degraded as low quality products even after reprocessing. Such low quality products are exported sometimes at lower price and the balance will be sent to the local markets directly. Therefore this will result in a loss of export volume and a loss of foreign exchange income. That estimated loss will be about Rs 70 million per year.

- ❖ Even after drying to about 30% of the volume, exporters get only 60% of the avail volume as Grade 1 Product. When we analyze the trade channel it is

obvious that a large amount of volume gets dried at each point along the channel. As much as 83% of the volume of Cinnamon bark products are dried and treated with Sulfur at the wholesale level. Therefore a considerable proportion of Cinnamon bark products in the local markets are in inferior quality.

- ❖ Lack of basic economic infrastructure, high production cost, shortage of skilled labor and low labor productivity and lack of rural credit mechanisms were identified as main problems encountered by the growers. Further their future prospects through institutional interventions in Cinnamon production are at very low level.
- ❖ The local merchants purchase the major portion of the leaf oil directly from distillers and most of the distilleries are single owned, homemade, low efficient, outdated and need modification. Facilities also available in distilling sheds need modifications to abide with quality requirements.
- ❖ Low price and market fluctuation are the major problems faced by the distillers. The amount of leaves available for processing (average 415 bundles/ month) is decreasing due to seasonal supply, labour shortage, utilization of leaves as mulching material in plantations...etc.
- ❖ Unlike the leaf oil market, the bark oil market remains in few hands of exporters, who have the direct linkage with the foreign buyers. They generally keep their technology as a secret weapon even without disclosing to the employees. They are satisfied with the quality levels of the product being supplied to the market as per the cost effectiveness, appropriateness of the technology, oil quality and easiness of handling.
- ❖ Machineries and equipment so far developed for Cinnamon processing is proved to be an appropriate approach to break down the social stigmas associated with Cinnamon peeling. It will help to convert Cinnamon processing in to a flow line operation while attracting more people to combat the labour shortage and expenses incurred on labour. By deskilling these tasks by mechanization and

automation it will help to design flow line production process enabling much greater productivity.

- ❖ High quality Cinnamon receives a premium price in the market. Although the peelers are paid on income share basis, they tend to make medium grade quills more. Because the quantity of fine grade quills a peeler can produce within a day is less. This will lead to less production volumes of high quality Cinnamon.
- ❖ Currently Peeling and post harvest operations are carried out under poor hygienic and working condition. They will not meet the Euregap, HACCP, Food Safety, Health & Safety and Phyto sanitary standards. Only very few companies have received the GMP standard and they are relatively performing well.



Figure 6.3 : GMP certified Company Employees a.) at work b.) the Uniform

- ❖ Although grown in Sri Lanka for centuries there has been a little improvement in productivity in peeling technologies as well as the distillation process. Therefore there has been no improvement in harvesting, post harvesting and leaf distillation technologies over the years.

ITI has introduced improved versions of distilleries already but however those are still to be popularized among the Cinnamon industry.

6.3 Recommendations

This section focuses the views provided by the industry professionals, findings of the research and already avail literature to propose policies and strategies in promoting the Cinnamon industry to gain the edge. Therefore following recommendations and polices were suggested in almost the same logical order to implement:

- Since there is no clear understanding of direct and indirect customers, the level of demand, the supply and the usages of these separate products...etc. which are very vital factors of the entire industry, it is the most important aspect to design and conduct an accurate and effective market survey for the entire industry. Up to date such a survey has not been carried out for the target markets. Further finding out the purposes they incorporate Cinnamon is a challenge and it is of great importance.

At the same time these market research and development activities should be done in a continuous manner from time to time. This will become very essential not only to identify new market segments with product diversification opportunities but also to keep moving the volumes in a profitable manner with the competition.

It is also very important to communicate with the customers and obtain the feedback for further development of the products. These structured market feedback mechanisms will help not only to develop the existing market & identify new market segments but also to implement strategically controlled measures through proper monitoring and evaluation systems to take the industry into the right direction.

- Developing a strategic plan for the entire Cinnamon industry is very vital at the next level. The entire stakeholders should be gathered together and their responsibilities and the expected supports should be clearly defined and the short term and long term objectives, targets, visions and missions should be clearly identified. Then it should be communicated to each party in the entire industry

and a proper action plan on individual basis should be prepared and submitted with clear deadlines and milestones.

- *Direct seeding in the field method* and *Seed bed/Cinnamon ball method* are two of the methods incorporated by the farmers popularly. But these methods are not recommended. Seeds are sown after filling the hole with top soil in the first method and due to high competition between seedlings it was observed a poor rate of establishment. In the latter method, raised beds of about 1 m breadth and convenient length are prepared to facilitate good drainage. Planting holes of about 4 cm in diameter and 4 – 8 cm in depth are prepared at 10 x 20 cm spacing using a peg. After filling these holes with some fine structured soil and 7 – 10 seeds they are covered with a layer of soil and may be watered daily if necessary. Artificial shade is provided until plants are about 12 cm tall and the removal of the shade is also done gradually.

Therefore the *Raising seedlings in poly bags method* should be followed and recommended for every plantation. In this method polythene bags of 12.5 cm x 20 cm size and thickness of 250 gauges with a potting mixture composed of equal parts of top soil and well decomposed cow dung used to raise seedlings. At least 8 seeds per bag is sown and thinning out is done if necessary to keep 5 to 10 seedlings per bag. Field planting is done after 3 months.

- The harvesting of the Cinnamon should be carried out within the proper time period to achieve benefits in two folds. They are the quality of the tree is saved for the long run and higher quantities of the bark yield are available.

When there are no flowers and fruits in the tree the harvesting process should be carried out. The tree stems should look like as shown with watery surface:



Figure 6.4 : The Cinnamon Stem with Watery Surface : Suitable for Peeling Process

- Educating and training the peelers will help to make them understand the importance of making quills of finer grades. Therefore the training of new peelers is too important to make a good quality product.

Alternatively, product diversification without depending only on quill form of Cinnamon as well as the attempts in mechanization of peeling under process improvement help to revitalize and safeguard the Cinnamon industry. In this endeavor new market opportunities and strategies have to be developed for product diversification.

Comparing with the other facts and costly peeling process with labour-intensive nature for quills preparation becomes the most acute problem in the Cinnamon Industry. Hence the said mechanization of the peeling process is very important in order to safe guard the Cinnamon industry in the future.

- The environmental pollution taken place at leaf oil stills should be analyzed and the corrective measures should be suggested as necessary. Proper standards should be introduced for such situations after carefully analyzing the process involved. The contents should be analyzed and subsequently the economic aspects of using the Cinnamon leaves as the firewood material should be evaluated and compared with the other purposes (e.g.: as organic manure for plants).

- The most critical issue giving limitation for the entire industry is the shortage of high quality Cinnamon to fulfill the export volume. Therefore necessary measures should be implemented to improve the Cinnamon cultivation, since there is a good opportunity to cultivate in the Northern & Eastern parts of the country as well. The potential lands for Cinnamon cultivation should be explored and promoting measures could be easily incorporated according to the current level.
- The cultivation has to make use of bio technology to cultivate short term high quality breeds to generate more income to the planter with improved productivity aspects. Therefore more concern on developing the research centers to improve the R&D activities should be focused with intended long term and short term targets to align with the industry strategic vision.

The necessary infrastructure and other required facilities should be provided through proper mechanism for the cultivators as per their individual requirements. This will motivate more people to get involved with Cinnamon planting. Thereby the technology aspects could be extended to areas such as water irrigation systems, manufacture of high yield Cinnamon fertilizers and novel methods to implement intra crop which will enhance the productivity...etc.

- Since the majority of planters are small holders (more than 80%) it is essential to have a subsidy schemes (E.g.: Fertilizer subsidy) and other necessary supports (arrange systems to collect Cinnamon harvest and/or quills to a regional hub at a good price) to take the daily operation smoothly.
- At the same time it is very vital to pre plan for the unexpected crisis situations which may arise due to natural hazards like Cinnamon diseases, market variations in the export market, the natural disasters like Tsunamis...etc. Therefore there should be some pre arranged relief mechanisms to assist. These supporting activities could be arranged through the relevant Cinnamon industry related authorities at regional levels.

- Identifying the right technology applications well suited for Sri Lankan environment and convincing the value chain players for the purpose of motivating them to achieve high productivity are very essential. Relevant Cinnamon related authorities should be given the responsibility to create such awareness coupled with the penetration mechanisms. These activities should be introduced to build the good relationships and improve the thrust among the industry players as necessary. These types of ongoing arrangements help to build the confidence among the entire industry enabling the whole industry to proceed towards a common objective.

- Manufacturing of value added products and diversification strategies to suit the global customer base are the timely requirements. In order to achieve this there should be a good understanding and strong relationship among the entire value chain players (as discussed above) and in this case especially it should be targeted and aligned the all three sectors plantation, processing & marketing to obtain the competitive edge.



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Therefore it is a very important aspect to form the clusters among the different sectors and take improvement strategies within the group in meeting the industry objectives. Through this clustering approach the entire sector will be benefited and the collectivism of the members within the same category will enable them to explore many new avenues to develop and reach a more common and sovereign situation.

Especially the Cinnamon oil distillers don't have a proper formal association or above highlighted clusters for the market promotional and expansion strategies to sustain within the economies of scale limits of the industry. Therefore strengthening of distiller associations and clusters have a positive move towards empowering them in marketing and sharing the knowledge towards sustainable development.

- At the same time government should speed up the promotion of the *Ceylon Cinnamon* or *True Cinnamon* brand name globally to identify new market requirements and policy strategies which have to align with industry volume growth. Although there are few quality standards available, it will be a necessity to form a Ceylon standard aligning with the existing ones since this product is native to Sri Lanka. Because it provides a sense of royalty and ownership to Sri Lankan soils in the minds of customers due to the historical value related to Sri Lanka.

The balancing duty structures to protect the industry in all directions and to penetrate the new global markets through viable agreements/ joint ventures/ foreign collaborations are other valuable aspects of immense consideration for the development.

- It should be focused the differentiation strategy to position the Cinnamon products as necessary. There is a high need to uplift the industry standards to a top level to gain the due respect (i.e.; similar to Tea sector/ Apparel sector...etc.). This recognition could be done through generating high markups by penetrating new upend market segments and by looking at the industry through new dimensions like promoting products with green concept and eco friendly environment...etc. However it is the recognition and perception that needs to drive forward from the community for the purpose of protecting the entire industry.
- Own capital is the main source of finance in the Cinnamon industry. They don't have enough capital to invest in more diversified areas, research and development activities or any other quality upgrading systems and mechanisms. Therefore it is needed to establish certain mechanisms to provide credit and other required facilities for the expansion and improvement of the technology to develop the entire industry.

- A technology shift for the modification of traditional plants for bark oil distillation is very essential. There are occasional moves for the extraction with Super Critical Carbon dioxide (CO₂ Extracts) for quality markets. These CO₂ extracted Cinnamon products seem to have higher demands from the developed countries. (PGI Exports Limited has a one pilot plant which can produce about 25 kg/month. This rate of production is far below to meet the required demand. The cost of a similar type of commercial plant is estimated to be around US\$ 1.2 mln). Therefore such plants could be targeted to install through proper technology transfer mechanisms.

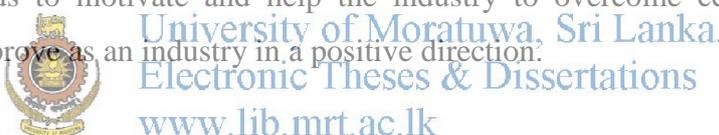
- There is an information gap for the distillers on avail technology as well as the market information. Most of the processors get the information from private and foreign companies or from ITI. Establish sources of information to provide required information through electronic media for this important sector to arm with latest trends and demands.

Non availability of the expertise in the field of essential oil fractionation, expensive technology, and hidden markets are the barriers encountered in the bark oil trade. The incorporation of the modern technology, research in to the specific areas, training of personals giving foreign exposure and international collaborations are the strategies to overcome these barriers and develop the bark oil sector as needed.

6.4 Direction for Future Research

The way this research was conducted helped a lot to achieve the objectives in a more logical manner. But there are many ways with more opportunities to carry out these research activities in many directions. It gives an empirical and theoretical significance for academic purposes and for the entire industry to cause direct impacts for the economy of Sri Lanka. Directions of the future research could be carried out to find empirical and theoretical aspects as follows:

6.4.1 Empirical direction

- This research has practical difficulties and limitations of getting validity of certain data especially related to the data collected on qualitative aspects. In that respect it is a necessity to stay for a considerable time period in relevant sectors to evaluate and measure the validity of these findings. That is an important area to be studied and allowed to make the right industry decisions based on the valid findings. This will automatically convert the entire study more towards qualitative aspects and the constructs associated in this research should be directly measured through their individual level of performances.
 - The other important research that could be carried out simultaneously is identifying the practical solutions for the operational issues. It may be practical, since the research study had been done while in the actual operations. Those solutions have a greater validity not because of its practicability but it also leads to motivate and help the industry to overcome certain issues and to improve as an industry in a positive direction.
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- Since the technology is one of the influential criteria to gain the competitive edge, there is the potential for a research to be conducted on how the technology impact could affect marketing trends in other plantation sectors in Sri Lanka. i.e.: Since Sri Lanka has the strength of producing best quality Cinnamon and other spice products research could focus in to those sectors as well. Therefore it will contribute very much to the Sri Lankan economy.
 - Finding solutions for the environmental pollution caused by the stills is of great importance. Therefore it is a better research area to find out suitable practical solutions for this boiling process. Since the Cinnamon leaves used for the distillation process would be a better solution with some improvements for the firing material.

- Also at high level it could be suggested to perform the research on finding out the ingredients of the cola soft drinks. Then it could be extended towards famous cola drinks like Coca Cola, Pepsi...etc. drinks. If it is found that there is a considerable amount of Cinnamon is included, then that is where it opens up many other opportunities.

6.4.2 Theoretical direction

- Identifying the relationship between the Cinnamon industry with the technology competency & market orientation is very beneficial. Because the possibility of testing hypothesis which had been built as a proposition from the variables will help to analyze many different behaviours under various conditions. This will also provide confidence level of the research sample and prove the significance of the relationship with the industry. Therefore it will greatly help to simulate situations very effectively and plan necessary decisions depending on the various situations.



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- One research objective might be to identify the level in which the technology stands in Sri Lankan Cinnamon industry. It could be done mostly through qualitative findings due to certain limitations. Therefore studying the prevailing technological aspects in another country will help to benchmark the production processes as required. Identifying the relationship of the technology standards of the two countries could be done through the quantitative methods, since the results of qualitative finding propositions are weak. This gives a greater impact to identify Sri Lankan comparative technology stand with respect to Cinnamon industry and to take relevant measures to gain the competitive edge in the export market.