Chapter: XI

Summary and Scope for Future Work
11.1 Summary

At a time when the whole world is witnessing growth in almost every aspect of business, the Indian tea industry is facing the worst crisis ever. The price of tea has been falling over last few years. Indian market has been flooded with foreign tea that are available at a lower price. As a result the fund position throughout the industry has suffered a setback. Workers of many estates have not been paid their wages and other statutory dues for months; operations in some have stopped and some are virtually in a state of closure.

Presently, when the export of Indian tea has considerably come down and Indian market has been flooded with tea from other countries, the need of the hour for the Indian tea industry is to stress a lot on production of Quality tea for sustenance and growth. (Chapter I)

While searching for the root of the ultimate effect ‘Quality of made tea’, in this study eight factors (viz., Genetic Factors, Environmental Factors, Cultural Factors, Leaf treatment Factors, Factory Hygiene Factors, Maintenance Factors, Labour Factors, and Processing Factors) have been identified and their causal relationships analyzed. The management of a garden, by putting sincere effort can improve upon the controllable factors (viz., Cultural Factors, Leaf treatment Factors, Factory Hygiene Factors, Maintenance Factors, Labour Factors, and Processing Factors) and minimize the effects of uncontrollable factors (viz., Genetic Factors, Environmental Factors). (Chapter III and Chapter IV)

In order to find out the most potential areas of cost reduction in a tea garden, a PARETO Analysis has been done on expenditure aspects of a garden. The analysis reveals that combination of expenditures on the heads labour, welfare and energy contributes 89% of the total expenditures. The experimental analysis on the Energy sector has revealed that key process for optimization of energy consumption is the drying process and the loss of thermal energy is estimated to be very high (more than 66% of the total input thermal energy). What concerns more in gardens is the reluctance of the management to re-use the exhaust air from the drying process. (Chapter V)

The literature survey in association with opinion and Questionnaire survey reveals that the Tea Industry in Assam is a good candidate for initiation of TQM principles. The aspects that make Tea industry in Assam a good candidate for TQM
implementation are: the employees of tea gardens have got close association with the
garden, a major part of the garden employees (the labourers) can be motivated by
initiating welfare programs, the belief that ‘garden’s progress is their progress’, positive
attitude of both the managerial and labour force and above all the congenial atmosphere
of ‘to be better of’ prevails in the gardens. It has been deduced that a Tea Garden
(system) involving number of sectors (subsystems) and other components (machinery,
human resources, external components etc.) demands active participation of all the major
units of the garden to meet the quality needs. (Chapter II, Chapter VI).

In the process of finding out the factors affecting Quality of Tea, the Tea Garden
is considered as the ‘system’ and this system is segregated into seven different sub-
systems (sectors) (viz., Human Resource sector, Processing sector, Maintenance sector,
Management Sector, Energy sector, Field/Garden sector, Welfare sector) and the
causality of the factors is studied. The ‘Total Quality Management Indicator (TQMI)’
and ‘Performance Indicator (PI)’ of tea gardens developed are appraisal tools to ascertain
the degree of total quality culture prevailing in a tea garden. The TQMI and PI would
help the Tea Management in assessing the standing of a garden in terms of overall
quality. TQMI assessment is to be treated as the ‘starting point’ for continuous
improvement efforts by tea management. The computation also helps Tea Management
in finding the weak areas (sub-systems) of the garden needing more attention for
improvement (the SPIs will indicate these areas). TQMI and PI in subsequent uses after
initialization of Continuous Improvement Efforts (CI), would help the Estate
Management in assessing the degree of improvement achieved in SPIs/TQMI/PI. TQMI
and PI may prove to be very useful in comparing performance of gardens under the same
management for identifying the garden(s) and their sectors needing more attention.
(Chapter VII)

The TQMI and PI, while analyzed for a set of three gardens shows positive co-
relation with the price –realized in auction by the gardens. (Chapter VIII)

The “Tea Information System (TIS)”, incorporates the TQMI and PI assessment
software. This Information System has the applicability of using it as a knowledge-base
providing the information on Assam and Indian Tea Industry, various processes of tea
manufacturing, tea facts, different grades of tea, the information about the culture of tea
tribes of Assam, tea vocabulary, standards in tea, a well covered tea directory. (Chapter IX)

The Systems Dynamics (SD) causal model incorporating the factors affecting TQMI of a garden has revealed that maximum effort from management on adherence to quality standards must be made for sustenance of higher TQMI of a garden. (Chapter X)

11.2 Specific Conclusions

11.2.1 Hindrances for TQM Initiation for Improving Performance of Tea Gardens

Feedbacks from tea estates management reveal that the performance of a tea garden has been an issue of grave concern for the tea industry for some time now. SPIs of the sectors may show stagnation if improvement measures are not taken seriously. In recent times, the changing economic scenario, the rising costs of production and uncertainty in price realization have brought about the issue of improved sector performance under brighter focus.

As per the feedback from the gardens under study the hindrances for initiating and implementing TQM in gardens for improving ‘performance’ by introducing a system linking remuneration to productivity and other performance determinants like discipline, attendance and qualitative parameters, can be classified under three heads:

1. Structural Hindrance
   - The tea industry has set traditions and “Dasturs” (habitual behaviour). The categorization of garden’s work follows a trend set by the wage board’s recommendation and bilateral agreements reached over last couple of decades
   - Growth opportunities for the garden labour force are limited
   - Promotion to higher grades i.e., Sirdars and Supervisors are largely based on seniority in service
   - Tea Management is bound by agreements with the unions to maintain the labour strengths at a certain level
2. **Price Realization Hindrance**
   - Major part of the cost of production in the form of wages is determined by the Estate Regulation linking wages to inflation while prices of the end product of a Garden (i.e., made tea) is determined by the market forces of demand/supply and consumer preferences.

3. **Growth Hindrance**
   - As an effect of the previous two factors, it is neither possible for the estate management to introduce attractive rewards, nor to open up growth opportunities to motivate the work force outside the prevailing parameters.

11.2.2 Proposed Counter-Active Measures

To counter-act the effects of these hindrances accompanied by the fact of rise in cost of production and uncertainty in price realization; the options identified are:

- Optimal Utilization of Resources: Labour, Land, and Equipment
- Declare 'war against wastage'
- Elimination of unproductive work for optimal use of manpower and energy

All these alternatives are presented point-wise in different heads as follows:

**A. Field Operations**

**Land and Labour**

- Increase yield from land using right clone applying right manure at right time and in the right way
- Increase productivity of plucking by increasing plucking yield of workers per day through effective planning

**Requisites for Improved Plucking Practices**

- Use of improved Plucking Aids: More effective and mechanized
- Use of alternative mode of carrying the basket while plucking (carrying plucking baskets on shoulder slows down plucking)
• Enhanced inspection on plucking as some leaves are un-plucked due to over-reach by the plucker
• Use of proper size of baskets as there is a tendency to slow down plucking when baskets are near full
• Keep height of the plants within permissible limit (use of right pruning cycle)

**Planting Material**
• Stress on R & D activities and continuous look for that 'wonder clone' which is high yielding and suitable for Geo-physical conditions of Assam with excellent quality in Cuppage and Liquor
• Improvised Drainage System in water logged areas with proper outlet
• Proper attention to Soil physiology (assessment of deficiency in soil)
• Use of effective Pesticides with proper evaluated MRL (Maximum Residual Level)
• Uprooting and Re-planting are to be taken up with high quality and high yielding planting material with closer spacing
• Increasing the bush population to the desired standard

**Research and Development**
• Research and development of Mechanized Harvesters
• Research for improved pruning equipment to enable the worker to prune with ease with less use of human energy and better standard of pruning
• Tea is a perishable commodity – research on design and development of carriage system for green leaf transportation to the factory would ensure its quality
• Development of cattle repellent in field- to keep cattle trespass at bay
• Development of Cheap type of fencing to reduce cost in garden sector
• Research on tea drying to minimize energy consumption and optimal drying
War against Wastage

- 15 minutes delay in reporting by a worker means in a labour force consisting of 1000 workers results in a loss of 250 man hours: curb on absenteeism, stress on labour punctuality
- On an average a tea estate of Assam consists of at least 12% unproductive labour force due to age old practices on the estate and commitment to social obligation. Identifying and employing them in other productive work would minimize wastage in Human Resource Sector

Uproot and Rejuvenate the Aging Bushes in Time

- Keep proper calendar for rejuvenation and record of age of the bushes (Appendix IV-K). This would increase SPI of Garden Sector.

Improvement of Agricultural Practices

- Strict adherence to the standards of practices (Appendix IV) for Quality Tea at optimal cost.

Supervision of Work

- Enhanced effort on effective supervision in Garden and Processing sector would increase SPI for these two sectors

B. Manufacturing Operations

Improved Technology- Machinery

- Installation of Conveyors wherever applicable
- Use of Standard CTC Machines
- Use of Continuous Fermenting Machines
- Use of Fluidized Bed Dryers
- Use of Conveyors in Sorting System

On Line Process Control in Factories:

- Ensure on-line process control in terms of
  ➢ Manpower utilization
  ➢ Energy usage

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Batch Inspection Method: The only means of Quality control in most of the gardens is to find the fault, or correct the process after the damage has been done (Use of off-line quality control is essential)

Packing Material: Use of standard packing material prevents quality deterioration in transit.

C. Human Resource

Value-based Education

- Stress on value of life and not on 'just to read and write'
- Stress on health, hygiene and sanitation

Awareness amongst the labour force can be achieved through education and counseling. It should be stressed that the workers be educated on the aspect of value of life. Counseling on health, hygiene and sanitation are very vital for a fit and productive labour force

Reduction of Alcoholism

Most of the workers, even female workers, are habituated to taking alcoholic drinks in an uncontrollable manner. It is the main reason of absenteeism, and bad health of workers. Drive against alcohol addiction would help the tea management in increasing the labour productivity.

Eradication of Other Avocation

Many workers in the tea gardens also indulge in gambling, theft of green tea leaf or made tea, lottery, etc. NGOs or Social organizations may help the management in eradicating such evil practices by workers.

Improved Health Care and Medical Facilities

Most of the Tea Estates of Assam are complying with the statutory requirements for labour Welfare. In spite of all this the death rate, sick absenteeism etc. among the labour community are still very high. Health awareness drives from management would definitely enhance the SPI for the Welfare and Human Resource Sectors.
Improved Quality of Life

- Improvement in respect of Housing, Water supply, line sanitation, electricity, health care, labour clubs and playgrounds. (SPI for Welfare Sector has got direct bearing with these activities)

This aspect has a bearing on the geographical location of the garden. In Tea gardens in close proximity to towns and industrial belt, the workers, especially the males view a plucking job to be one without dignity and want to work only in factory or give “Badli” (Substitute) and look for alternative employment outside the estate.

Wages:– Daily Rated
In spite of the Plantation provisions of fringe benefits e.g., ration, free housing, firewood, tea, protective clothing, etc., workers only value the cash money received in hand and fail to attach importance to perquisites. They do not attach importance to the fringe benefits, as these are given practically free of cost. A change in the present wage system (daily rated) is essential. However, this is a very sensitive issue and needs careful approach in this direction.

Employment of Casual Labourers
No Garden can run without the Casual Workers for harvesting and factory work. Permanent Male Workers dislike Night Shift in Factory. In certain estates the permanent labour force goes slow on plucking to force the management to employ casual workers. Gardens must think to curb this phenomenon.

D. Motivational Imperatives
Modification of Incentive Scheme
- The present scheme of providing an additional 27 paise for each Kg of green leaf plucked over the standard pluck is ineffective.
• Implementing group incentive scheme where Sirdar/Supervisors get reward in cash or kind for the performance of his 'Chalan' (allotted job) suggested.

Include Fringe Benefits in Wage
Clubbing fringe benefits with wage would make the pay package attractive and appealing as workers are motivated only by the cash received in hand and they do not attach importance to the fringe benefit.

Promotion to Higher Grades
Should be linked to productivity and not merely on seniority

Counseling of Workers
Form Garden specific Quality Circles involving voluntary participation of Sirdards, garden and factory labourers (both permanent and casual), hospital employees, drivers, antigens, electricians, supervisors etc. The concept of participative management must be nurtured through these quality circles for better SPIs for Human Resource and Management Sectors.
Continuous on-job training programs for workers are essential to maintain an able work force.
Training programs on both job and human aspects for managers and supervisors are necessary.

Grouping of Performers: High/Low
Initially low performers and high performers should be grouped separately and rewarded on their performance suitably. Instill the spirit of competition among the groups so that the low performers would try to reach the level of the high performers and the high performers would always try to be ahead of the followers.
11.3 Scope for Future Work

The present work on TQM application in Tea Industry is limited to the Tea industry in Assam only for its homogeneity in regards to culture, topography and other environmental factors. The study aimed at finding the basis of TQM implementation in tea gardens of Assam. However, the study does not focus on procedural implementation of it.

The study has got the following scopes for extension:

1. While developing the model for quality of tea, the factors within the garden system have only been considered in this work. The factors beyond the garden like the distribution system of the tea dispatched from the garden, the auction related factors, the retail market factors etc. are treated as exogenous factors in this study. However, they do affect the demand for tea. The model for factors affecting quality of made tea can be extended beyond the garden to include these aspects.

2. On the aspect of wastes in tea plantation and processing, this study is limited to energy sector, peripheral analysis in processing sector (factory layout) and maintenance sector only. More detailed experimental analysis of wastes in all the sectors may be carried out separately.

3. The TQMI/PI model covers seven sectors within the Tea garden system. TQMI/PI model may be extended beyond the garden considering all the exogenous variables as described in (1) above.

4. The universal applicability of TQMI/PI model is possible only when there evolves a consensus on common scores and weightages agreed by all the companies having gardens in Assam. The study can be extended for evolution of this consensus for using the TQMI/PI model for inter-garden performance evaluation.

5. The SD causal model developed in this thesis is aggregative in nature. Development of the SD Flow Diagram and the mathematical model for policy simulation would make it more effective for long term policy planning.

6. This thesis deals with the identification of the factors contributing to quality of made tea at the garden level, identification of management controllable factors,
development of a measure for assessment of standing of a tea garden in terms of total quality culture, assess the applicability of TQM culture in tea industry. The development of procedural implementation schedule of TQM in a garden after assessment of TQMI and PI has not been covered in this study. There exits a scope to extend the study on this aspect.