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Adoption Factors for Sustainability Certifications in Tea Estates of Eastern India

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Abstract: Sustainability certifications are widely being adopted in tea estates across India. This study was aimed to identify the motivating factors which significantly affect the decision of tea estates of eastern regions of India to opt for various sustainability certifications. A questionnaire survey for74 certified tea estates and 54 non-certified recognized tea estates from Darjeeling and Dooars areas of West Bengal and Upper, Lower and Cachar areas of Assam in India was conducted. Principal Component Analysis and Independent sample T-Test for means for the Adopters and Non-Adopters of certification were done to understand which factors are significantly affecting the decision to opt for the certifications. The findings showed that management commitment and market, regulatory & social dynamics are the most substantial factor which affects decision of adoption of sustainability certifications. Perceived benefits for sustainability certifications didn't qualify as an adoption factor of sustainability certifications for tea estates in eastern regions of India.

Keywords — Adoption Factors, Drivers, Sustainability Certifications, Tea

I. INTRODUCTION

Tea had been a part of Chinese culture for many centuries but it was around 206 – 220 AD that widespread use of tea was popularized by the Chinese Han Dynasty. It was the silk caravans that travelled from China to Europe brought in tea to India, as per the common belief. However the Camellia sinensis is also native to India, and grew in the wild long before its true worth was realized. Tea leaves was a part of diet sometimes, though mostly it was used for its medicinal properties by the natives in India. Tea has transformed into what's now famous as chai, often taken in brewed form or a flavourful black tea sweetened with sugar and milk along with spices like cardamom and ginger.

II. EFFECT OF TEA CULTIVATION

Earlier research has opined that there is major impact on the environment as well as the society with tea cultivation. The impact on environment is severe with mono-cropping and loss of diversity. Similarly the impact on society is also critical since tea estates are labour intensive and mostly rely on age-old traditions of cultivation and manufacturing practices with the workers and their families residing within the tea estates and affected by the decisions of the management with respect to labour welfare.

The total area under tea cultivation is still growing. Hence, in order to make enough land available for tea cultivation, vast areas are being annexed and that entails deforestation, which has numerous negative effects on ecosystems. The most hazardous environmental impact of tea production is the alteration of habitat which can culminate in loss of biodiversity. With the elimination of trees results in the concurrent reduction of organic matter content in the soil and the subsequent hampering of the soil's water-holding capacity and increases soil erosion. In order to achieve higher productivity, estates are kept weed free by weeding and applying scrapers. Manual weeding using scrapers resulted in severe soil loss of about 30 cm of topsoil per hectare by erosion.

Thus, apart from soil erosion, the water table is lowered, with consequent harmful effects on the moisture status of the surface layers of soil. Decades of studies formulated the application of inorganic fertilizers for gearing up productivity. However, due to the poor organic status of the soil and deterioration of water-holding capacity, infiltration is retarded, with consequential runoff problems. The recurring use of nitrogenous fertilizers causes the release of other elements from bound sites and leaching out into rivers and other water bodies, rendering them absolutely irreconcilable with biodiversity. Decreasing soil pH and frequent application of weedicides have taken a toll on earthworms, which keep the soil in fine tilth.

III. SUSTAINABLE DEVELOPMENT & TEA ESTATE

Sustainability is about meeting basic human needs and wants. Most definitions stress that sustainability requires taking decisions that recognize the connections between actions and effects in the environment, economy and society. The term was used by the Brundtland Commission which coined what has become the most often-quoted

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definition of sustainable development as development that "meets the needs of the present without compromising the ability of future generations to meet their own needs."

Despite India's historical success with the tea industry, in recent years, the industry has faced serious competition in the international and national market which has lead to the present crisis. In the market, the rising competition at domestic as well as international front has deepened the crisis of tea industry of India. Tea prices in India are being driven down by factors as below:

1. Decline in demand for Indian tea in the global market
2. Defects in auction system
3. Poor price realization
4. Defective market structure
5. Increase in cost of production
6. High rate of absenteeism of skilled workforce

The only solution to address these problems is to adopt the concepts of sustainable agricultural practices. These practices not only address the significant impacts on environment and society but also address the business risks associated with tea cultivation and sales. The practices are aimed to make the tea estates more competitive in the changing markets with changing consumer demands.

IV. Sustainability Certifications in Tea Estates of Eastern India

Sustainability Certifications acts as tools for the Tea Estates to adopt the concepts of sustainable agriculture management system and to understand that the adoption is maintained continually. It is a validation that the practices adopted in tea cultivation is in line with the requirements set in various sustainable agricultural standards. That tea estates have not only established the requirements on ground but are also implementing, documenting and maintaining the same with a focus for continual improvement of farming practices. It is a result of the management's conscious decision to highlight the achievements of the tea estate with respect to adoption of the sustainable farming practices.

There is no compulsory standard for sustainable farming practices world over. Widely agreed upon standard or sustainable agricultural practice are not available. SAI, IFOAM, FLO, SAN have some voluntary sustainable standards and labels at the global level. In India, a well formulated standard in this regard is still wanting.

However, recently the Tea Board of India has developed India Tea Sustainability Program in the name and style of Trustea and has motivated registered tea estates in India to adopt the same. The most popular sustainability certifications adopted in tea estates in eastern regions of India are Rainforest Alliance, Fairtrade, Organic Standards like NOP, NPOP, JAS, COR, USDA as well as ISO 22000:2005 (Food Safety Management Systems) and also membership of Ethical Tea Partnership (ETP).

V. Need For The Study

The need for this study is envisaged since there is limited information and research work associated with adoption of sustainability certifications in Tea Estates. The aim of this study is to identify the major adoption factors or drivers for obtaining Sustainability Certifications in tea estates located in the eastern regions of India.

VI. Literature Review

With the limitation of credible research in sustainability certifications for tea estates in India, the focus of the literature review was on various system certifications for industries and it's adoption factors and benefits.

Darnall [4] found that non-environmental considerations such as maintaining a competitive advantage, enhancing public relations, meeting customer demands, and reduction in overall costs seemed to outshine more in a company's decision to seek certification.

Gbedemah [5], indicated that early adopters of sustainability standards tend to be larger, greener and less driven by regulatory, competitive or media pressures. They believed that the organizations have the interest and resources to pursue new environmental initiatives. Yin & Schmeidler [6] highlighted that economics and institutional pressures also play a significant role in determining adoption of environmental management system.

Dladla [8] opined that for the Small and Medium Scale Enterprise (SME) sector improving regulatory compliance is the most prominent driver for adoption of certification. However, there are sector specific differences with other drivers. On the other hand, motivations for adopting environmental certification are comparable, and reducing environmental impacts is a dominant factor. There are no sector related differences on the actions for environmental management system implementation, instead training and raising awareness for staff was emphasized. There are also signs of a possible correlation between the drivers and motivations, and the actions taken by SMEs. Finally, there are signs for positive correlation between the benefits and the reasons for adoption.

Erlandsson [9] concluded the corporate implications of strong media pressure and the role of interdisciplinary competence. Coelho [10] highlighted the benefits of adopting certification include reduced risk, lower insurance premiums, cost savings, regaining new and old customers, and a broad competitive advantage. He also highlighted that certification would help the firm to address the entire legal, commercial and other challenges related to the environment.

Yakhou & Dorweiler [11] concludes that there is a need for integration of an environmental policy with business policy, and adequate emphasis should be given in developing a multi-discipline team so as to support a top-level strategy and to achieve the benefits from directing a company in an environmentally sound manner.

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Arif [12] identified that the major business drivers for adoption of environmental certification is acting consistently with corporate policy, societal responsibility and better corporate image. Companies realized the associated benefits for adoption to environmental certification as improved working environment, significant cost savings, decrease in environmental impacts, reduced complaints from regulatory authorities and pressure groups as well as higher staff morale.

Senarath and Athauda [16] have identified the adoption factors by Sri Lankan Tea Industries for Fairtrade Certification and have concluded that adopting of Fairtrade standard in the corporate tea sector is significantly determined by attitude, working experience of the estate manager, revenue of the estate and number of employees in the estate. Some of the standards like no child labour and forced labour, non-discrimination, freedom of association, environmental friendly farming practices and safe working conditions can be observed in most of the estates.

Maina [18] states that the rainforest alliance certification supported governance and public policy by upholding compliance to national laws, regulations, good agricultural practices, best practices, efficiency, transparency and accountability in the tea sector. Policy makers should mainstream relevant voluntary sustainable agricultural standards and certification as part of good regulatory practice and good public governance.

Zialon and Zialani [19] have identified the adoption factors of implementation of an environmental management standard in Malaysian manufacturing companies. The study indicates that the most influential factors are motivation, followed by role of top management, market orientation, and organizational culture. The study also revealed that perceived benefit factor does not play a significant role in determining adoption.

Zutshi and Sohal [21] highlights the four main categories for adopting environmental certification are the market (mainly the external forces directly impacting the competitiveness of the companies), social (which includes pressure from various groups, the public and the community at large), financial (this broadly encompasses pressure from the financial institutions and insurance companies, not forgetting the fines and legal liabilities resulting from non-compliance) and regulatory (pressure from the guidelines and regulations at both national/international levels to continue working of the organizations).

VII. METHODOLOGY

Based on literature review and personal experience of the researcher obtained through interviews with various stakeholders in the tea industries, twenty five (25) variables were identified which were put to test to understand whether they act as driving factors for adoption of sustainability certifications. Quantitative research method using questionnaire survey was deployed. The target respondents for the questionnaire were Senior Management of Tea Estates who has direct control in decision making about adoption of sustainable certifications. The lists of tea estates were obtained from the Directory of Tea Board of India 2007.

The questionnaire was circulated electronically to almost 300 Tea Estates located in Darjeeling, Upper Assam, Lower Assam, Dooars and Cachar areas of eastern India.

The questionnaire consists of two parts: 1) Demographic background of the Tea Estate; 2) Response on various driving forces for adoption. Before the actual survey were conducted, the questionnaires were pre-tested and reviewed for structure, readability, ambiguity and completeness, and the survey instrument was refined in light of comments from the respondents.

The respondents were asked to rate the answer of each question on a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree) to what extent the statement fits the situation in their organization. Cronbach's Alpha was calculated for the questions to test the reliability of the questionnaire and value obtained was more than 0.7 which confirmed that the questionnaire is fit to be used for data collection.

The twenty five (25) variables which were tested are given as follows:

Table 1: Variables affecting adoption of Sustainable Certifications

Sl.	Id.	Variables
1	T1	Goal setting by senior management
2	T2	Resource support by senior management
3	T3	Periodic reviews for implementation by senior management
4	T4	Importance for certification vis-à-vis cost reduction
5	T5	Employee motivation by senior management
6	B1	Demand by customers
7	B2	Improved corporate image of the tea estate
8	B3	Improved waste management practices
9	B4	Improvement in pest management practices
10	B5	Savings in regulatory costs
11	B6	Overall profitability
12	B7	Improved customer relationship
13	B8	Penetration to newer customers
14	M1	Increased competitiveness
15	M2	High return on investments
16	L1	Demand by regulatory authorities
17	L2	Willingness to learn sustainable agricultural practices
18	L3	Reduced regulatory inspections

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Sl.	Id.	Variables
19	L4	Increased awareness about regulatory requirements
20	L5	Voluntary identification of regulatory violations
21	O1	Involvement and enthusiasm of employees
22	O2	Prior adoption of quality & food safety management systems
23	O3	Employee satisfaction
24	O4	Community satisfaction
25	O5	Existing organizational development programs of the tea estate

VIII. RESULTS & CONCLUSION

A total of 128 responses were obtained, out of which 74 responses were obtained from Tea Estates who have adopted any sustainability certifications and 54 responses were obtained from non-adopters. Descriptive Statistics revealed the following information about the adopters of sustainability certifications.

Most of the adopters for sustainability certifications who responded to this survey operated both in Domestic and in Export Markets (57%) which may signify that they faced stronger market demand for adoption of sustainable agricultural practices. The same is depicted in Figure No. 1.

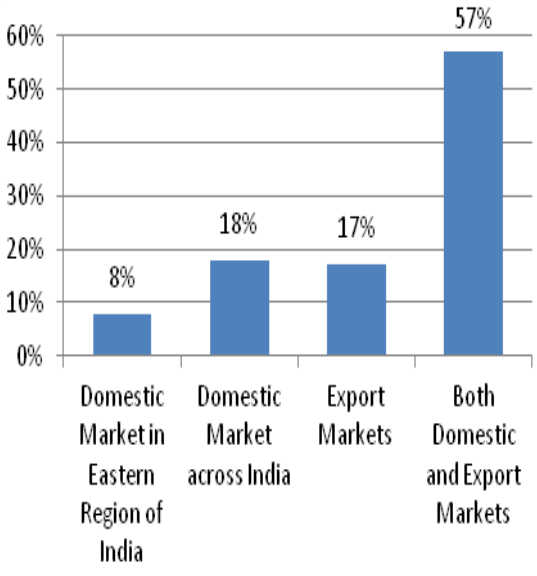

Figure 1: Types of Markets Catered by Adopters

Majority of the adopters who responded are from Darjeeling area (32%) and Upper Assam area (33%) and least is from Cachar area (6%). Same is depicted in Figure No. 2

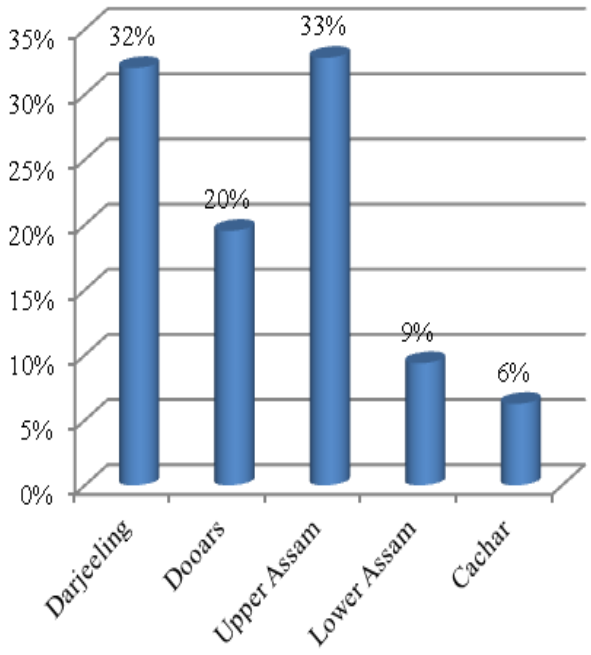

Figure 2: Percentage of Adopters from different regions

Majority of the adopters who responded manufacturers different types of teas i.e. Orthodox, CTC, Green and Specialty Teas. This is depicted in Figure No. 3.

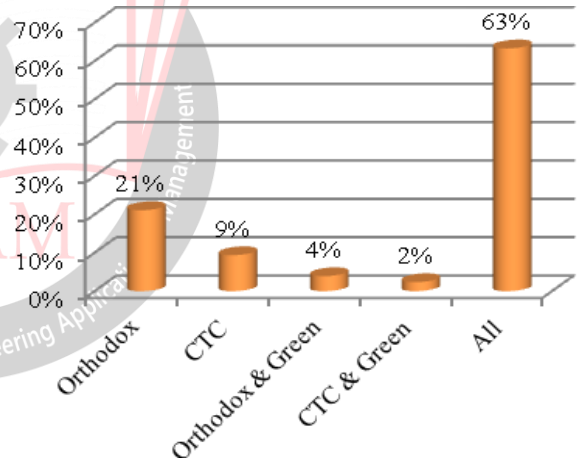

Figure No. 03: Percentage wise distribution of type of tea manufactured by Adopters

Post data collection, statistical analysis of the data was done by using open source software package named PSPP. In order to identify the most probable factors that would affect the decision of adoption of certification, Factor Analysis was conducted using PSPP Software.

Total twenty five (25) variables were subjected to the principal component analysis with varimax rotations and three (03) factors were achieved with the variance information of 93.8%. The rotated component matrix describing the number of statements with factor loadings in each factor is mentioned in Table 5.1. The factor scores were also shown for each three (03) factors obtained from principal component analysis.

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Table No. 2 – Rotated Factor Scores

Variable	1	2	3
T1	-0.68	0.67	0.72
T2	-0.76	0.31	1.16
T3	-0.75	0.37	1.06
T4	-0.79	0.30	1.14
T5	-0.66	0.32	1.19
B1	1.09	-0.14	-0.66
B2	1.10	-0.13	-0.70
B3	-0.10	0.87	0.14
B4	-0.20	0.91	0.27
B5	0.59	0.36	-0.19
B6	0.81	-0.17	-0.37
B7	1.37	0.20	-0.39
B8	0.89	-0.21	-0.38
M1	-0.29	0.46	0.76
M2	0.03	0.74	0.10
L1	1.04	-0.03	-0.25
L2	0.44	0.21	-0.21
L3	0.86	-0.38	-0.41
L4	0.97	-0.21	-0.35
L5	1.16	0.01	-0.41
O1	0.43	0.90	0.31
O2	1.19	0.07	-0.22
O3	1.08	0.00	-0.38
O4	1.00	-0.20	-0.44
O5	1.09	0.03	-0.36

Based on the factor analysis, three (03) factors were summated and they are renamed as given in Table No. 3. Only the most probable variables having a factor loading above 0.7 was retained.

Table No. 3 – Driving Factors selected for Testing

Sl.	Factor Name	Variables
1.	Management Commitment	T1, T2, T3, T4, T5 and M1
2.	Market, Regulatory & Social Dynamics	B1, B2, B6, B7, B8, L1, L3, L4, L5, O2, O3, O4 and O5
3.	Perceived Benefits	B3, B4, B5, M2, L2 and O1

Based on Table No. 3, the following null hypotheses were formulated:

H1: There exists no significant relationship between Management Commitment and successful adoption of Sustainability Certifications in the tea estates of eastern regions of India.

H2: There exists no significant relationship between Market, Regulatory & Social Dynamics and successful adoption of Sustainability Certifications in the tea estates of eastern regions of India.

H3: There exists no significant relationship between Perceived Benefits and successful adoption of Sustainability Certifications in the tea estates of eastern regions of India.

Independent sample t-tests were conducted to test the hypotheses. For H1, the t-test results are given in Table No. 4

Table No. 4: 't-test' between Adopter and non Adopter Tea Estates for Management Commitment

	"t-test" value	p-value	Status	Mean	Std. Dev
T1	6.64	0.000	Adopter	4.93	0.25
			Non-Adopter	3.65	1.64
T2	9.02	0.000	Adopter	4.91	0.29
			Non-Adopter	3.09	1.70
T3	8.78	0.000	Adopter	4.92	0.27
			Non-Adopter	3.22	1.63
T4	9.20	0.000	Adopter	4.93	0.25
			Non-Adopter	3.09	1.70
T5	8.26	0.000	Adopter	4.78	0.41
			Non-Adopter	3.09	1.70
M1	4.91	0.000	Adopter	4.31	0.47
			Non-Adopter	3.50	1.31

Since for the above variables under the factor Management Commitment shows a low p-value (<0.05) at 95% confidence limit hence the null hypothesis is rejected. This means that there exists a significant relationship between Management Commitment and successful adoption of Sustainability Certifications in the tea estates of eastern regions of India.

For H2, the t-test results are given in Table No. 5

Table No. 5: 't-test' between Adopter and non Adopter Tea Estates for Market, Regulatory & Social Dynamics

	"t-test" value	p-Value	Status	Mean	Std. Dev
B1	-17.19	0.000	Adopter	1.12	0.33
			Non Adopter	3.35	1.05
B2	-17.47	0.000	Adopter	1.11	0.31
			Non Adopter	3.41	1.07
B6	-11.79	0.000	Adopter	1.36	0.48
			Non Adopter	2.76	0.85
B7	-19.72	0.000	Adopter	1.77	0.80
			Non Adopter	4.35	0.62
B8	-12.18	0.000	Adopter	1.43	0.50
			Non Adopter	2.96	0.91
L1	-13.53	0.000	Adopter	1.84	0.72
			Non Adopter	3.56	0.69
L3	-12.1	0.000	Adopter	1.09	0.29
			Non Adopter	2.69	1.08
L4	-13.27	0.000	Adopter	1.42	0.50

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	"t-test" value	p-Value	Status	Mean	Std. Dev
			Non Adopter	3.09	0.92
L5	-15.36	0.000	Adopter	1.78	0.73
			Non Adopter	3.83	0.77
O2	-15.65	0.000	Adopter	1.96	0.80
			Non Adopter	4.00	0.61
O3	-17.7	0.000	Adopter	1.59	0.59
			Non Adopter	3.61	0.68
O4	-12.65	0.000	Adopter	1.51	0.50
			Non Adopter	3.26	1.03
O5	-14.45	0.000	Adopter	1.84	0.74
			Non Adopter	3.72	0.71

Since for the above variables under the factor Market, Regulatory and Social Dynamics shows a low p-value (<0.05) hence the null hypothesis is rejected. This means that there exists a significant relationship between Market, Regulatory & Social Dynamics and successful adoption of Sustainability Certifications in the tea estates of eastern regions of India.

For H3, the t-test results are given in Table No. 6.

Table No. 6: 't-test' between Adopter and non Adopter Tea Estates for Perceived Benefits

	"t-test" value	p-value	Status	Mean	Std. Dev
B3	-1.05	0.296	Adopter	4.12	0.33
			Non Adopter	4.3	1.38
B4	0.22	0.830	Adopter	4.09	0.29
			Non Adopter	4.06	1.52
M2	-2.01	0.066	Adopter	4.19	0.39
			Non Adopter	4.48	1.16
O1	-5.38	0.076	Adopter	1.96	0.65
			Non Adopter	2.96	1.41

Since for the above variables under the factor Perceived Benefits shows a high p-value (>0.05) hence the null hypothesis is accepted. This means that there exists no significant relationship between Perceived Benefits for Certification and successful adoption of Sustainability Certifications in the tea estates of eastern regions of India.

Thus from the above study we can conclude that Management Commitment and Market, Regulatory & Social Dynamics acts as major drivers or adoption factors for sustainability certifications. Perceived Benefits is found not to be a significant adoption factor in Tea Estates in eastern regions of India since both adopters and non-adopters are of the same opinion about this factor. This is in contradiction that this factor would affect the decision to opt for certification. The findings are in line with the adoption factors for environmental management systems as per Zutshi and Sohal [21]. It also corroborate the findings of Zialon and Zialani [19] that perceived benefit of certification is not a significantly contributing factor which affects decision to opt for sustainability certification.

IX. LIMITATIONS OF THE STUDY

The facts discussed in this study would be based entirely on the responses to the questionnaire therefore, ascertaining the genuineness of the responses was identified as the limitation of the study. The responses were limited only to the tea estates located in Eastern part of India, primarily West Bengal and Assam and hence one of the limitation may be that the responses mayn't be homogeneous for the entire country and the tea community as a whole.

The number of responses obtained was approximately five (05) times of the total variables tested for and this may affect results obtained by the statistical tools used in this study.

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