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EVALUATING THE ESG ACTIVITIES OF SELECT TEA PROCESSING AND MANUFACTURING COMPANIES IN INDIA:SPECIFICITY ANALYSIS

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ABSTRACT :

Business Responsibility and Sustainability Reporting (BRSR) is a mandatory requirement for the top 1,000 listed companies in India as per the guidance of SEBI. BRSR aims to bring transparency and foster responsible and sustainable business practices. The BRSR is meant to provide a comprehensive coverage of Environment, Social and Governance (ESG) aspects of sustainability in corporate activities with non-financial information. The factual representation of ESG in the report serves as the authenticated evidence of corporate performance in achieving overall sustainability. The Central Pollution Control Board of India classifies industrial sectors into four categories Red, Orange, Green and White ranging from High to Low Polluting Industries, to drive their activities towards sustainability. Therefore, the study aims to develop a visualization model to assess the quality of ESG activities undertaken by select low-polluting companies in India based on the published BRSR, it focuses on a hierarchical structure of ESG-related terms to assess qualitative data.

Accordingly, the sample consists of companies from low-polluting sectors, which are selected purposively. The companies in the Tea processing and manufacturing sector is notified as low- polluting and were included in the study. The NSE-listed companies representing five low-polluting sectors, with the highest market capitalization as of the last day of September 2023, were selected purposively, totalling 5 companies. The study covers a period of 2022 -2023. The secondary data were collected from the BRSR of the companies.

The content analysis was carried out with data mining tools such, as Word Embedding, Word Clustering Methods, Multinomial Naive Bayes Classification, and Relation Extraction Model, ESG scores of the select companies were obtained through the CRISIL database. The data mining tools were used to categorize the E, S and G- related activities. Quantity and specificity scores were used to understand the companies' current performance for ESG activities and the future performance measured through the score obtained from the CRISIL database. The results reveal the contribution of the low-polluting segment in various ESG measures to ensure sustainability.

Keywords: Business Responsibility and Sustainability Reporting, Low polluting companies, ESGscore analysis, Content Analysis and Visualization Model

Introduction :

Companies with healthier ESG performance enjoy enhanced public perception andreputations, which may make it simpler to recruit and retain staff and increase customer loyalty. In order to fight climate change, the environmental side places focus on corporate practices that do not overexploit environmental resources for future generations. The relationship between ESG disclosure and performance needs to be considered because stakeholders, regulators, investors, researchers, and policy makers are likely to be aware of the ESG practices. The term "environmental, social, and corporate governance" (ESG) describes the three key elements that help businesses expand sustainably. Businesses release corporate social responsibility (BRSR) reports that contain data on ESG initiatives, both qualitative and quantitative. The results are often given as a single score or rating. The companies' inability to provide comprehensive and quantitative ESG data and their difficulty in locating comparable benchmarks for the vast majority of small and medium-sized businesses that dominate the Baltic investment market. (Zumente & Bistrova, 2021).While the methodology used in third-party evaluations of a company's ESG performance vary, the categories included and the weights given to each aspect make disclosure scores an objective way to gauge the amount of information enterprises disclose.The ESG reporting contains both quantitative and qualitative information. Quantitative information is presented in numerical form and qualitative information is the initiatives and strategies to improve ESG performance. The quantitative data facilitates objective assessment. The qualitative ESG data has certain limitations. Since no uniformity in the format insisted, manual analysis of ESG report of companies becomes a tedious process and suchmanual analysis tends to be subjective.

Text mining deals specifically with unstructured text data which is a component of data- mining. It includes the extraction of valuable information from unstructured text data using natural language processing (NLP) techniques.

Text mining is the non-trivial extraction of hidden, previously unknown, and potentially useful information from large amount of textual data‘‘. In text analysis, data mining techniques such as association and link analysis, visualisation, and predictive analytics are used for information extraction and retrieval. The main objective is to apply natural language processing (NLP) techniques to convert text, which is unstructured data, into structured data for analysis.

Review of literature

Sustainability is so important; businesses should share their environmental, social, and governance (ESG) goals. While extrinsic evaluations are helpful in emphasizing particular facets of embedded success, Stakeholder demands for building data are drastically shifting, with a higher focus being placed on performance on environmental, social, and governance (ESG) key performance indicators (KPIs) in addition to traditional financial returns. These stakeholders include investors, governments, renters, and end users. (Sridharan & Maddern.,2022) important ESG values for countries advancing toward the Fourth Industrial Revolution, which will ultimately contribute to global cooperation and sustainable development(Yoon et al., 2023). A lot of attention has been paid in academics and industry to the concepts of CSR (corporate social responsibility), ESG (environmental, social, governance), and corporate citizenship as the social and environmental obligations of firms have been emphasized by many stakeholders(Park et al., 2023) Organisation and summarization of the textual data were accomplished through the Topic Modelling technique (Lupi et al., 2023)To increase the comparability of ESG reporting, a hybrid methodology based on current ESG standards and reports is used to extract simpler, ex post, and dynamic taxonomies(Jiang et al., 2023). Reports quantitatively by using natural language processing techniques to tell the differences between "good" and "not good" integrated reports(Nakagawa et al., 2020).

Labelling models through extensive language model fine-tuning that was previously trained on financial materials (Kannan & Seki 2023). Businesses' sustainability practices as an intangible asset and their effect on their financial success. It also presents a toolbox for indexing businesses' sustainability metrics (Ning et al., 2021). Dual utility makes a substantial contribution to both scholarly research and public discourse by bridging the gap between theoretical study and practical applications, as well as by fostering a more nuanced and educated understanding of the subject matter (Shi Bowen.,2023).

Research Design and Methodology

Sampling Design

The population of the study covers in total, 621 in companies rated by NSE as top disclosure on ESG activities. The Ministry of Environment, Forests, and Climate Change (MoEFCC) has created standards for classifying industrial sectors based on the pollution index, which is a function of the resources consumed and the emissions (air pollution), effluents (water pollution), and hazardous wastes produced (Press information Bureau, 2016).The industrial sector were classified into Red, Orange, Green and white categories for progressive environment management. Based on such a classification the study considered low polluting (White), companies ESG activities to understand the difference if any, in the intensity of ESG activities. Accordingly, five companies with highest market capitalization under Tea processing and blending companies which is classified in white category, to represent low polluting industries were selected. Thus, the financial sample consisting TATA Consumer Products Ltd, CCL Products India Ltd, Rossell India Ltd, Jayshree Tea and Industries Ltd

and Warren Tea Ltd under low polluting category, the study period conducted is the financial year 2022-2023.ESG score have been taken from the CRISIL.

Developing a Visualization Model

The Phases involved in developing the model are Pre-processing of Data, Word Clustering, Word Structuring and Visualisation of Data. This section details each phase.

Phase I: Pre-processing of Data

Initially, the Business Responsibility and Sustainability Report of the chosen companies from the Iron and Steel sector and Electricals and Electronics sector for the Financial Year 2022–2023. Data were gathered from the websites of the corresponding companies and which were converted into text files.

Phase II: Word Clustering

Using the NLP In order to identify activities associated with E, S, and G independently, the extracted words were divided into four sets of embedded word vectors (Wang et al., 2019), denoted by the labels "E," "S," "G," and "Other." There was no clear connection between the words "Other" and ESG operations. As a result, the tea processing and manufacturing sector generated 1265 E- related words, 1150 S-related words, and 2437 G-related words. Table I shows examples of translated results.

WORD CLASSIFICATION

Group	*Example of Words*	Low Polluting
Environmental	GHG emissions, Waste management, Resource use, green products and biodiversity, Energy use, Water management	1265
Social	Employee and worker management, Communities, Stakeholder management, product quality,	1150
Governance	Board composition and functioning, Board and director independence, Board functioning, Management track record,transparency & Shareholder rights	2437

Source: Computed data

Phase III: Word Structuring

To aid in interpretation, a hierarchical word structure was developed based on the prevalence and divergence of terms in a model. Greater hierarchical words are frequently used and convey broad ideas or subjects. Lower hierarchical words are less common and convey particular concerns or measures [17][18]. The figure's lines connect words with minimal divergence that are highly connected [19][20]. We have an instinctive understanding of each word's placement. For instance, "water pollution" falls under the "Environment" topic and includes the more specific topics of "Discharge" and "Effluent" and "Hazardous" etc.,

The following is the concrete process for defining word structure. We define ‖v‖ as the vector norm of vector v and vk as the embedding vector for word k (k = 1,..., K). For the purpose of simplicity, we have left off the suffixes that indicate E, S, and G in the following expressions, but we have specified the structures for terms that are connected to E, S, and G. First, based on how often a word appeared in the reports, we ordered the words in descending order. But the first word (k = 1) is fixed to either "environment", "society‖ or "governance‖. The divergence di,j between a word embedding vector vi and vj was then computed. Divergence di,j is defined as

$$d_{i,} = (1 - \cos(v_i, v_j))2$$

Where the cosine relationship between vi and vj is indicated by cos(vi, vj). Cos (vi, vj) has a value between −1 and 1, while di,j has a value between 0 and 4. Therefore, terms I and J have the same (opposite) meaning if divergence decreases (increases). Although this definition of the divergence lacks a theoretical basis and is heuristic, we find that it produces findings that are relatively straightforward. Finally, a word frequency has been derived to structure the words (Table 1).

Phase IV: Visualisation of Data

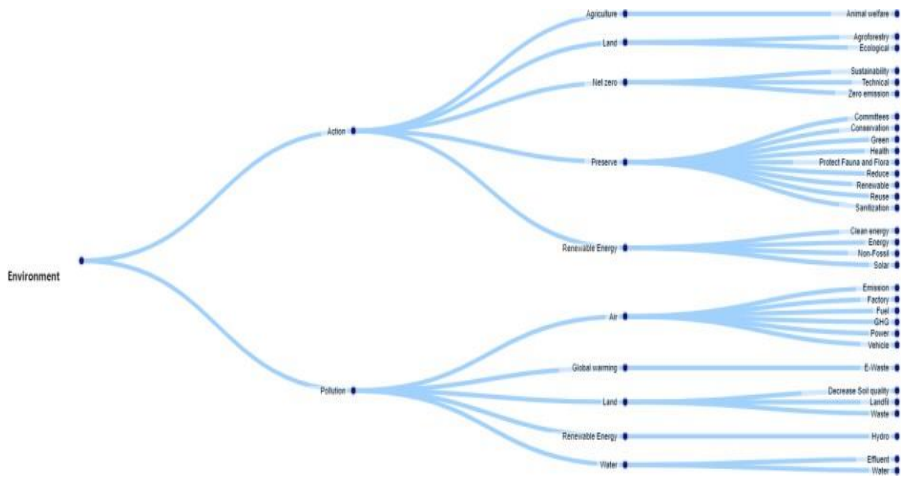
The derived words for environment", "society‖ and "governance‖ for polluting and non- polluting sectors were visualised separately. For example, the results under _environment' of polluting category were grouped as _Pollution' and _Action' according to the activities done by the firms and rooted towards the action verbs used in their sustainability report.

Results and Discussion

Visualisation Model for Environment Activities of Select Low Polluting Companies Environmental responsibility is a moral obligation that business have to preserve natural resources, minimise pollution, while lowering other forms damages to the environment. Business wants to fulfil their corporate environmental responsibility obligation must create a comprehensive plan that incorporates a range of sustainability.

A. Visualisation Model for Environment Activities of Select Tea ProcessingCompanies Environmental pollution caused by less polluting firms mainly affects air, land and water and activity causing global warming all causes of concern for air pollution through emission by factories with burning fuel, execution power and vehicles. The land is affected due to a decrease in soil quality land fill and waste generation.

Fig.2 Visualisation Model for Environment Activities of select Tea processing companies



The corporate action focused on the preservation of flora and fauna, conservation activities promoting greening processes healthy environment, sanitation, reduction and reuse of water, increased investment in renewable energy, use of clean energy, non-fossil fuel and solar. Maintaining ecology by afforestation. Mismatch remedial action taken by the companies against pollution emitted. Air pollution is a major concern in industries. Instead of addressing the issues directly different actions were taken to compensate the damage caused to the environment.

Visualisation Model for Social activities of select Tea processing companies

Community development is the force area, under social performance of companies particularly establishing care centres, charity, building infrastructure, incorporating social agenda in the mission of the company, community participation upliftment of poor, poverty eradication and welfare, The health dimension is given importance by facilitating ambulance, food and nutrition. The qualitative programmes conducted for community development are in line with the improvement of economic conditions, entrepreneurship and skill training and medical camps.

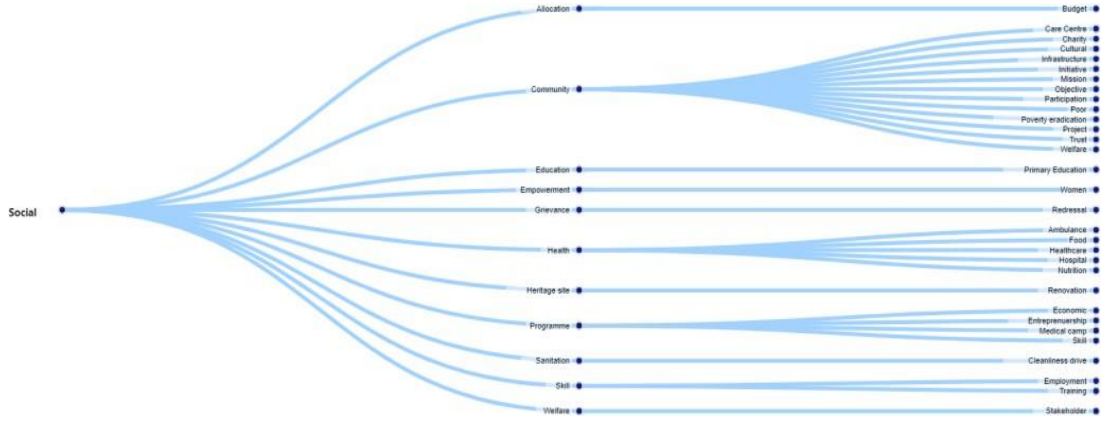


Fig. 4 Visualisation Model for social activities of *select* Tea processing companies s

Visualisation Model for Governance Activities of select Tea processing companies

The companies are effectively administrated through various boards and committees. The statutory laws, rules and regulations while appointing the executives, non-independent directors and members. Effective accountability and communication practices are well-placed and interactive with investors and stakeholder regulation. The employees are well communicated. The governance system has proper policies for fixing remuneration, solving grievances and disciplining action unethical practices of employees. The companies are transparent by disclaiming their periodic reports by adopting statutory compliance.

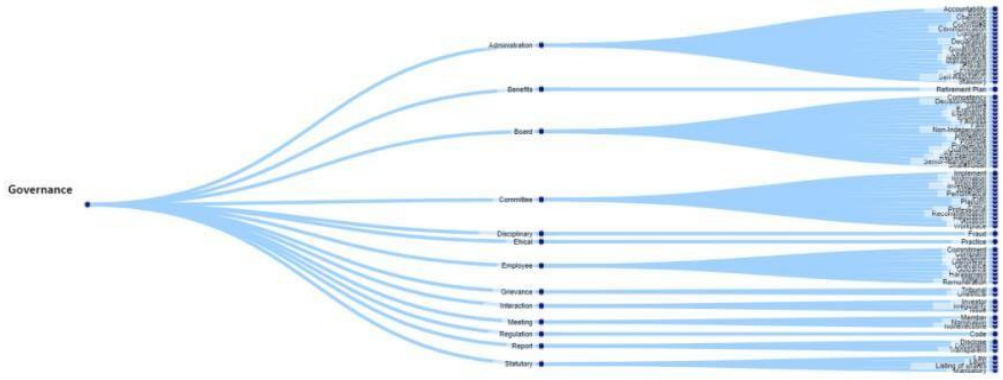


Fig.6 Visualisation Model for Governance Activities of *select* Tea processing companies

The companies are adopting a good governance system and management is accountable for the activities of the companies. They have well constituted committees and they are responsible for the stakeholders. The reporting system of the companies is transparent and discloses the required information to the community. The companies also have a proper legal environment to settle various disputes. Hence governance aspects low polluting companies are on a similar line. companies have put in place a good governance system consistent with the aim of their respective businesses.

Scores to Evaluate Qualitative Information

Since scoring establishes a baseline for comparison, it is crucial for assessing ESG initiatives. As a result, a method was constructed for qualitatively rating ESG actions and further, analysed the correlations between qualitative scoring and ESG quantitative performance since there is a belief that companies that actively participate in ESG provide a greater ESG performance.

D1. Scores to Evaluate Qualitative Information

Businesses that engage in a lot of ESG activity probably have a lot of words on ESG in their Integrated Annual Reports. As a result, the quantity of ESG activities can be estimated by the number of words relating to ESG. Additionally, companies that focus on enhancing ESG performance are likely to use specific terms in their reports. Verbal specificity can therefore serve as a proxy for the quality of ESG activities to define the scores for quantity and specificity. Although, for the reason of

clarity, the suffixes were deleted when calculating scores for E, S, and G. The quantity score $s_{i,t}^{qnt}$ is the logarithm of $n_{k,,t,}$ which is the frequency of occurrence of the term 'k' in the report of firm

_i'issued in year _t'. For the purpose of preventing antilogarithms from being zero, add 1 to $n_{k,,t,}$.

$$s_{i,t}^{qnt} = \sum_{k=1}^{k} \ln(f(n_{k,i,t,} + 1)$$

The specificity score $s^{spc}_{i,t}$ is the average of the report's deviation from the top term such as"environment," "social," or "governance". $1_{n_{k,,t} \geq 1}$denotes the indicator function, which returns one

if the frequency of occurrence is greater than or equal to one and zero otherwise.

Table II Specificity Score of select Tea processing companies

ESG elements	Specificity Score
Environmental	-0.07396**
Social	-0.080763**
Governance	-0.03887**

Source: Computed data

Table II represents the Specificity score and presents the use of specific words in the sustainability report to indicate the various actions pursued by companies on ESG dimension and intensity. The specific efforts are significant to improve the score on E, S and G. To compute the specificity score key parameters included in the CRISIL's methodology were considered. Accordingly, the specificity scores were computed for all the companies. The total proportion of the truly negative elements is answered through a specificity score. The true negative elements in the BRSR of select companies show the environmental element at 7.3 per cent, the Social element at 8 percent and the Governance element at 3.8 per cent.

Conclusion :

ESG has grown in importance as an investment consideration in recent years. The qualitative data on ESG activities that are revealed in integrated annual report reports were examined in this study. A text mining technique was created to visualize ESG activities in the word structures of ESG-related terms because the difficulties of manual analysis limit the practical applications of qualitative information. Furthermore, a score has been put out to assess the qualitative data pertaining to ESG initiatives. The investigation found that low polluting firms have disclosed qualitative information in their sustainability reports, which have been revealed in the study through quantity and specificity scores. Element wise tea processing and manufacturing companies have given significant importance to social activities, since CSR is mandatory. The Governance for sustainability is being ensured through board meetings conducted for their purposes and constituting the board, employee welfare, dissemination of information to stakeholder and reporting transparency in operation.

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