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Study of Environmental Reporting Practices in Selected Sugar Companies in India

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Abstract

In today's era, we see that our climate is changing, maybe due to various factors like ecological imbalance, environmental pollution and many more, which has given thought of sustainability in business. As a result, many companies have started with sustainability concept. Not only philosophy but performance as well as reporting & disclosure are important for the same and to increase reputation in the market. Corporate sustainability reporting is an emerging discipline, which includes much information to be disclosed by companies. This paper is trying to evaluate and compare the scope and quality of the current practice in sustainability reporting in sugar companies with the main objective to leverage power of information. For the evaluation, a set of different parameters had been developed and were embedded into a scoring system. There are mainly five broad categories namely, Management Approach & Reliability, Reporting Guidelines, Environmental, Social, Governance, which can be combined and named as MRESG. Looking to the conclusion, the company which has scored highest is the best company not only in sustainability reporting but also for investment from investor's point of view.

The increasing attention of companies to sustainability reporting globally has been reported . Companies need appropriate systems to measure and control their own behavior in order to assess whether they are responding to stakeholder concerns in an effective way and to communicate the results achieved.

Keywords: Sustainability reporting, Management Approach & reliability, reporting guidelines, Environmental, social, Governance

Introduction

Environmental reporting refers to the disclosure of information related to the environmental performance of an organization or industry. It involves the quantification and communication of various environmental parameters and their impact on the environment. Environmental reporting plays a crucial role in promoting transparency, accountability, and sustainable practices in industries[1].

Environmental reporting has become an increasingly important aspect for Indian industries as they strive to achieve sustainable development and meet regulatory requirements. In recent years, there has been a growing awareness of the impact of industrial activities on the environment, leading to a push for greater transparency and accountability in reporting practices[2]. Environmental reporting serves as a means for industries to communicate their environmental performance, initiatives, and impacts to stakeholders, including investors, regulators, and the wider community. Indian industries have made significant strides in implementing environmental reporting practices to address growing concerns about the environmental impact of industrial activities. One of the key parameters in environmental reporting is the measurement and reporting of greenhouse gas emissions[3]. This includes not only direct emissions from industrial processes but also indirect emissions from purchased electricity, heat, and steam. In addition to greenhouse gas emissions, Indian industries are also focusing on reporting their water usage, waste management practices, and efforts to reduce air pollutants. This comprehensive approach to environmental reporting allows stakeholders to gain a clear understanding of the industry's environmental footprint and the steps being taken to mitigate it. Furthermore,

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environmental reporting in Indian industries also encompasses the disclosure of environmental risks and opportunities, demonstrating a commitment to identifying and addressing potential environmental challenges[4]. By providing detailed and transparent information, industries can improve their credibility and demonstrate their commitment to sustainable and responsible business practices.

As the Indian economy continues to grow and industrialize, there is a greater need for comprehensive environmental reporting parameters to ensure that industries are operating in an environmentally responsible manner. This not only involves reporting on emissions, waste management, and resource conservation, but also on the implementation of environmental management systems and adherence to environmental regulations[5].

Sugar Industries in India

Sugar Industries in India have been a significant contributor to the country's economy, but they also have a substantial impact on the environment[6]. Therefore, it is essential for the sugar industry to adopt comprehensive environmental reporting parameters to track and communicate their environmental performance accurately. One of the critical aspects of environmental reporting for the sugar industry is the measurement and disclosure of water usage. The sugar manufacturing process is water-intensive, and reporting on water consumption, as well as initiatives to reduce water usage and improve water management practices, is crucial for stakeholders to understand the industry's impact on water resources. Additionally, the sugar industry needs to focus on reporting their waste management practices, especially considering the organic waste generated during the production process[7]. It is essential for industry to transparently communicate their efforts to minimize waste generation, promote recycling and reuse, and properly dispose of unavoidable waste to mitigate their environmental impact.

Furthermore, as a high-energy consuming industry, the sugar sector needs to report on their energy usage and initiatives to reduce energy consumption and transition towards renewable energy sources. This includes the measurement and disclosure of greenhouse gas emissions resulting from energy consumption, both directly from production processes and indirectly from purchased electricity. Reporting on the steps taken to reduce emissions, increase energy efficiency, and transition to renewable energy sources will be crucial in showcasing the industry's commitment to environmental sustainability[8].

In addition to these parameters, the sugar industry should also consider reporting on their land usage, biodiversity conservation efforts, and initiatives to minimize the use of agrochemicals and pesticides. These aspects are particularly significant considering the agricultural nature of the industry and its reliance on land and natural resources[9]. Transparent reporting on these parameters will provide stakeholders with a comprehensive understanding of the industry's environmental impact and its efforts towards sustainable and responsible practices.

Legislation on Environmental Reporting in India

India has implemented various laws and regulations pertaining to environmental reporting to monitor and manage environmental impact. Some key legislation related to environmental reporting in India includes:

The Environment Protection Act, 1986: This act serves as a framework for environmental protection and lays down the foundation for various regulations and policies related to environmental reporting.

The Water (Prevention and Control of Pollution) Act, 1974: This legislation aims to prevent and control water pollution. It requires industries to obtain consent for water and discharge standards, which involves regular reporting of water usage and discharge data.

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The Air (Prevention and Control of Pollution) Act, 1981: This act addresses air pollution concerns and mandates industries to comply with emission standards. Reporting on air emissions and compliance is a crucial aspect under this law.

The Environment Impact Assessment (EIA) Notification, 2006: The EIA Notification mandates environmental clearance for various development projects. It requires project proponents to submit detailed project reports including environmental impact assessments and mitigation measures.[10]

The National Green Tribunal (NGT) Act, 2010: The NGT deals with cases related to environmental protection and conservation of forests and other natural resources. It often requires extensive reporting and documentation during legal proceedings.

Corporate Social Responsibility (CSR) Rules under the Companies Act, 2013: While not directly focused on environmental reporting, companies meeting certain thresholds are required to spend a portion of their profits on CSR activities, which often include environmental initiatives. Reporting on CSR activities, including environmental efforts, is mandatory for eligible companies.

State Pollution Control Boards (SPCBs) Regulations: Each state in India has its own Pollution Control Board, which enforces environmental regulations at the state level. These boards often require regular reporting from industries and other entities regarding their environmental compliance.

The Plastic Waste Management Rules, 2016: These rules regulate the manufacture, usage, import, and recycling of plastic materials. Reporting requirements related to plastic waste management are included to ensure compliance.

These laws and regulations are regularly updated and amended to address emerging environmental concerns and align with international agreements and commitments. It's essential for businesses and industries to stay updated with the latest requirements and ensure compliance with environmental reporting mandates.

Type of information included in Environmental reporting:

Environmental reporting in Indian sugar industries typically includes various types of information related to the environmental impact of their operations. This reporting is often done to comply with regulations, demonstrate corporate social responsibility, and enhance transparency with stakeholders. Some common types of information included in environmental reporting for Indian sugar industries are:

Emissions: Reporting on emissions of greenhouse gases (GHGs) such as carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O) from various processes including combustion of fossil fuels, waste management, and agricultural activities.[11]

Water Usage: Information on water withdrawal from local water sources, water consumption in production processes, and measures taken for water conservation and wastewater treatment. This may include details on water recycling and reuse efforts.

Waste Generation and Management: Data on the types and quantities of waste generated during sugar production processes, such as bagasse, molasses, and wastewater sludge. Reporting also includes information on waste management practices, recycling efforts, and waste disposal methods.

Energy Consumption: Reporting on energy consumption across different stages of sugar production, including electricity, heat, and steam usage. This may also include efforts to improve energy efficiency and increase the use of renewable energy sources.[12]

Biodiversity Impact: Information on the impact of sugar production activities on local biodiversity, including land use changes, deforestation, and habitat destruction. Reporting may also include initiatives to protect and restore biodiversity, such as reforestation programs and habitat conservation efforts.

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Chemical Usage: Details on the types and quantities of chemicals used in sugar production processes, such as fertilizers, pesticides, and herbicides. Reporting may also include efforts to minimize chemical usage through sustainable agricultural practices and integrated pest management.

Compliance with Regulations: Reporting on compliance with environmental regulations set by the Indian government and other relevant authorities. This includes adherence to pollution control norms, water quality standards, and waste management regulations.

Environmental Management Systems (EMS): Information on the implementation of environmental management systems such as ISO 14001, including policies, procedures, and performance indicators related to environmental sustainability.

Environmental Impact Assessments (EIAs): Reporting on the findings of environmental impact assessments conducted for new projects or expansions, including potential environmental risks and mitigation measures.[13]

Stakeholder Engagement: Information on engagement with local communities, NGOs, government agencies, and other stakeholders on environmental issues related to sugar production. This may include dialogue sessions, community outreach programs, and collaborative initiatives to address environmental concerns.

Air Quality Monitoring: Information on air quality monitoring efforts to assess the impact of sugar production activities on local air quality. This may include measurements of particulate matter (PM), sulfur dioxide (SO2), nitrogen oxides (NOx), and other air pollutants emitted from combustion processes and other sources.

Carbon Footprint: Reporting on the carbon footprint of sugar production operations, including direct emissions from on-site activities and indirect emissions associated with purchased electricity and other energy sources. This may involve the calculation of carbon dioxide equivalents (CO2e) and efforts to reduce carbon emissions through mitigation strategies and carbon offset projects.[14]

Land Use and Soil Management: Information on land use patterns associated with sugar cultivation, including the conversion of agricultural land for sugarcane cultivation and its impact on soil health and fertility. Reporting may also include measures to promote sustainable land management practices, such as crop rotation, soil conservation, and organic farming techniques.

Sustainable Sourcing Practices: Reporting on efforts to promote sustainable sourcing of raw materials, such as sugarcane, including adherence to ethical sourcing standards, certification schemes (e.g., Fair Trade, Bonsucro), and support for smallholder farmers. This may also include initiatives to address social and environmental issues in the supply chain, such as land tenure rights, labor practices, and community development.

Environmental Investments and Innovations: Information on investments in environmental technologies, infrastructure upgrades, and research and development initiatives aimed at reducing the environmental footprint of sugar production operations. This may include investments in cleaner production technologies, waste-to-energy projects, and innovations in water conservation and reuse.

Environmental Performance Indicators: Reporting on key performance indicators (KPIs) related to environmental sustainability, energy intensity, water usage efficiency, waste recycling rates, and emissions intensity per unit of production. This allows stakeholders to track progress over time and compare performance against industry benchmarks and targets.

Environmental Education and Training: Information on environmental education and training programs for employees, contractors, and suppliers to raise awareness about environmental issues and promote

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sustainable practices. This may include training sessions on environmental management, pollution prevention, and compliance with environmental regulations.

By including these additional points in environmental reporting, Indian sugar industries can provide a more comprehensive overview of their environmental performance and demonstrate their commitment to sustainable development and corporate responsibility.

Research Methodology:

The aim of this study was to conduct a comprehensive assessment and comparative analysis of the breadth and Caliber of environmental reporting practices within the sugar industry. To accomplish this, a sophisticated framework comprising diverse parameters was devised and integrated into a robust scoring methodology. It is crucial to emphasize that this analysis abstained from directly appraising the environmental reporting efficacy of individual sugar companies. Instead, it focused on scrutinizing the data provided in their respective annual reports for the fiscal year 2022-23.

Objective of Research:

The objectives of this study on environmental reporting parameters in India are:

1. To analyse the current practices of environmental reporting among selected Indian sugar companies.
2. To compare the environmental reporting practices of selected companies.

Sample Size & Sources of Data:

For the analysis of reporting sample size is 5 leading sugar companies for the year 2022-23. Data has been collected from the company's Annual reports from the year 2022-23.

Data Analysis & Interpretation:

The following parameters have been considered for the comparison of sugar companies. Based on various environmental reports for different sectors, I have selected parameters for environmental reporting in sugar companies as given below.

1. The rating scale has been developed to get an overall picture of environmental reporting practices in sugar industries. The score has been assigned (0-2) to the following parameters.

- "0" If company does not provide any information, "1" if company provides partial information, "2" if company provide complete information in the annual report.

2. As all the parameters carry different importance in their nature, it is again weighted with the factor 0.5, 1 & 2.

- "0.5 If parameter has less impact, "1" if parameters have medium importance whereas "2" have high importance for reporting.

3. For the total score (TS) within one category, the score of each indicator was multiplied with the weight of the indicator and summed up to get the total score. Therefore, each company can score a maximum of 74 points.

The following are the parameters for the environmental reporting in each company for the year 2022-23

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1. Environmental Policy
2. Environmental Pollution
3. Environmental Compliance
4. Environmental Disclosure
5. Environmental Expenditure

Table.1 shows a score system in each parameter

S.N.	Parameters		Score (0-2)	Weight factor	Total Score (score*weight)
1.	Environmental Policy	Energy Efficiency Policy	2	1	2
		Green Building Policy	2	1	2
		Waste Reduction Policy	2	1	2
		Carbon Footprint Policy	2	1	2
		Biodiversity Policy	2	1	2
		Zero Burning Policy	2	1	2
		Green Plantation Policy	2	1	2
		Zero Liquid Discharge Policy	2	1	2
2.	Environmental Pollution Details	Air Pollution	2	2	4
		Water Pollution	2	2	4
		GHG Emission	2	1	2
		Soil Pollution	2	1	2
		Noise Pollution	2	1	2
		Ozone Substance	2	0.5	1
3.	Environmental Compliance	Air Pollution Type & weight	2	1	2
		Air Pollution Ozone Depleting Substance	2	0.5	1
		Reduction in Green House Gas	2	1	2
		Air Contaminant & Measures taken for control	2	1	2
		Total water withdrawal from source	2	1	2
		Ground Water Protection measures	2	1	2
		Treatment of greenhouse gas	2	1	2
4.	Environmental Disclosure	Legal Proceeding for Environment	2	1	2
		Energy Minimization	2	2	4
		Land Water use Minimization	2	1	2

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		Description of Impact on Biodiversity	2	1	2
		Waste management	2	2	4
		Innovation management	2	1	2
		Environmental safety	2	1	2
5.	Environmental Expenditure	Description of Environmental Expenditure	2	2	4
		Amount Spent on Water Pollution Control	2	1	2
		Amount Spent on Air Pollution Control	2	1	2
		Amount Spent on Plantation	2	1	2
		Amount Spent on Environmentally Friendly Machine	2	1	2
Overall score					**74**

Analysis of Score

S.N.	Parameters		Total Score	Balrampur Chini Mill Limited		Bajaj Sugar Limited		Dhampur Sugar Limited		Dwarkesh Sugar Limited		Dalmia Bharat Limited	
				2021-22	2022-23	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23	2021-22	2022-23
1	Environmental Policy	Energy Efficiency Policy	2	2	2	2	2	2	2	2	2	2	2
		Green Building Policy	2	0	0	0	0	0	0	0	0	0	0
		Waste Reduction Policy	2	2	2	2	2	2	2	2	2	2	2
		Carbon Footprint Policy	2	2	2	2	2	2	2	2	2	2	2
		Biodiversity Policy	2	2	2	2	0	2	0	2	0	2	2
		Zero Burning Policy	2	0	0	0	0	0	0	0	0	0	0
		Green Plantation Policy	2	2	2	2	2	2	2	2	2	2	2
		Zero Liquid Discharge Policy	2	2	2	2	2	2	2	2	2	2	2
2	Environmental Pollution Details	Air Pollution	4	4	4	4	4	4	4	4	4	4	4
		Water Pollution	4	4	4	4	4	4	4	4	4	4	4
		GHG Emission	2	0	2	0	2	0	2	0	2	0	0
		Soil Pollution	2	0	0	0	0	0	0	0	0	0	0
		Noise Pollution	2	0	1	0	1	0	0	0	0	0	0
		Ozone Substance	1	0	0	0	0	0	0	0	0	0	0
3	Environmental Compliance	Air Pollution Type & weight	2	2	2	2	2	2	0	2	2	2	2
		Air Pollution Ozone Depleting Substance	1	0	0	0	0	0	0	0	0	0	0

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		Reduction in Green House Gas	2	0	0	0	2	0	2	0	2	0	0
		Air Contaminant & Measures taken for control	2	2	2	2	2	2	2	2	2	2	2
		Total water withdrawal from source	2	2	2	2	2	2	2	2	2	2	2
		Ground Water Protection measures	2	2	0	2	2	2	0	2	0	2	2
		Treatment of greenhouse gas	2	0	2	0	2	0	2	0	2	0	0
4	Environmental Disclosure	Legal Proceeding for Environment	2	2	2	2	2	2	2	2	2	2	2
		Energy Minimization	4	4	4	4	4	4	4	4	4	4	4
		Land Water use Minimization	2	2	2	2	2	2	2	2	2	2	2
		Description of Impact on Biodiversity	2	0	0	0	2	0	2	0	0	0	1
		Waste management	4	2	2	2	2	2	2	2	2	2	2
		Innovation management	2	2	2	2	1	2	2	2	2	2	2
		Environmental safety	2	2	2	0	2	2	2	2	2	2	2
5	Environmental Discharge & Initiatives	COD/BOD of Discharge Water	4	4	4	2	0	4	2	2	2	4	4
		TSS of Discharge Water	2	2	2	2	0	2	2	2	2	2	2
		Liquid Discharge	2	2	2	2	0	2	2	1	2	2	2
		Total Plantation	2	2	2	2	0	0	1	2	2	1	2
		Environmentally Friendly Machine	2	0	0	0	2	0	0	0	2	0	0
Overall score			**74**	**52**	**55**	**48**	**50**	**50**	**51**	**49**	**54**	**51**	**53**

The details of the total score out of 74 sugar companies for the two years are as follows. The analysis has been done with the help of MS EXCEL. Calculation for the same is given in table 2.

Sugar Companies	Years	
	2021-22	2022-23
Balrampur Chini Mill Limited	52	55
Bajaj Sugar Limited	48	50
Dhampur Sugar Limited	50	51
Dwarkesh Sugar Limited	49	54
Dalmia Bharat Sugar Limited	51	53

Table.2

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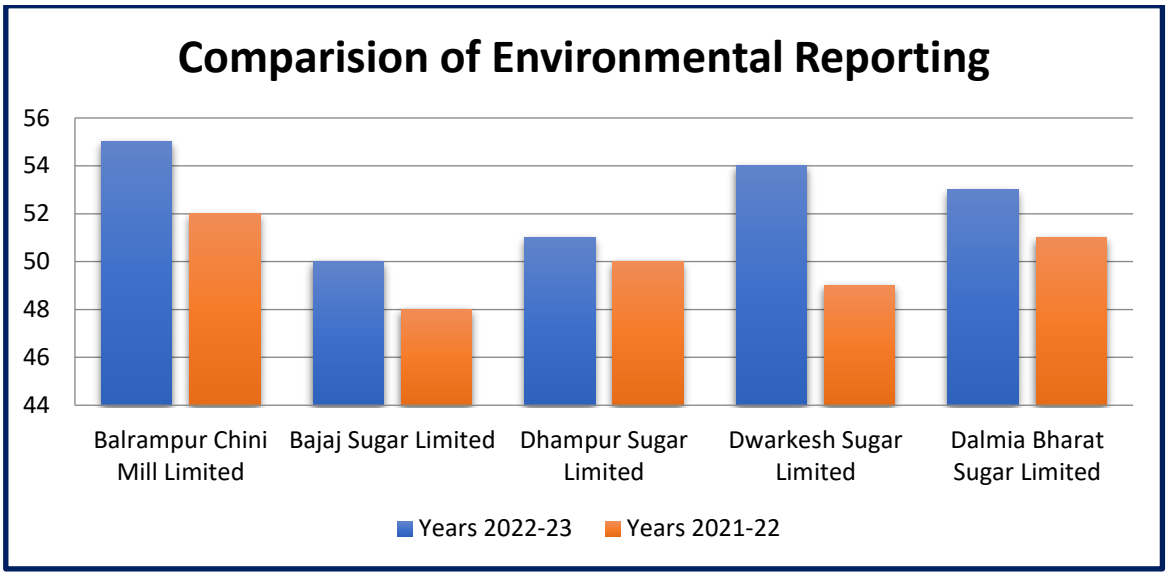

The chart shows the highest performance of environmental reporting score by Balrampur Chini Mill Limited with highest score of 55 in the year 2022-23 among all 5 companies. While Dalmia Bharat Sugar Limited is consistent in reporting for all 2 years and Dwarkesh Sugar Limited has improved very well during the last years. On the other hand, the other two companies are improving their reporting system. Many of the standards which are very important do not follow that. As well as all the companies fail to report links or references for further questions.

Conclusion:

Looking to above given analysis, all the companies are supporting environmental reporting may be little information need to be updated well in time, but above result gave us the first answer to the question that Indian companies are also ready to adopt environmental reporting approach in their work. And based on the scoring result we can say that investors can easily take decisions by looking at higher score companies among the sugar companies. As a part of the conclusion all these sugar companies have revised the method of reporting as well as all the companies are following maximum guidelines for reporting. But looking at the final conclusion among all five companies, Balrampur Chini Mill Limited is the lead company in terms of environmental reporting.

References

1. Aldy, J. E., Hrubovcak, J., & Vasavada, U. (1998). The role of technology in sustaining agriculture and the environment. In Ecological Economics (Vol. 26, Issue 1, p. 81). Elsevier BV. https://doi.org/10.1016/s0921-8009(97)00068-2
2. Chatterjee, B., & Mir, M. (2008). The current status of environmental reporting by Indian companies. In Managerial Auditing Journal (Vol. 23, Issue 6, p. 609). Emerald Publishing Limited. https://doi.org/10.1108/02686900810882138
3. El-Haggar, S. M. (2007). Sustainable Development and Environmental Reform. In Elsevier eBooks (p. 125). Elsevier BV. https://doi.org/10.1016/b978-012373623-9/50006-x

4. Ezhilarasi, G. (2019). An examination of environmental disclosures of most polluting companies in India. In International Journal of Accounting and Finance (Vol. 9, p. 111). https://doi.org/10.1504/ijaf.2019.10028443
5. Ghosh, M., Sarkar, D., Banerjee, P., & Ray, H. S. (2013). Energy Consumption in Indian Non-Ferrous Industries: Need for Bench Marking of Data. In International Journal of Metallurgical Engineering (Vol. 1, Issue 6, p. 108). https://doi.org/10.5923/j.ijmee.20120106.02
6. González, M. de la C., & Martínez, C. V. (2013). Evaluation of the environmental, social and governance information disclosed by Spanish listed companies. In Social Responsibility Journal (Vol. 9, Issue 2, p. 220). Emerald Publishing Limited. https://doi.org/10.1108/srj-08-2011-0065
7. Hamid, S. R., Cheong, C. B., Shamsuddin, A., Masrom, N. R., & Mazlan, N. A. B. (2021). Sustainable development practices in Services Sector: A case of the Palace Hotel from Malaysia. In Evergreen (Vol. 8, Issue 4, p. 693). Kyushu University. https://doi.org/10.5109/4742113
8. Jamous, N., & Müller, K. (2013). Environmental Performance Indicators. In Environmental science and engineering (p. 3). Springer Nature. https://doi.org/10.1007/978-3-642-32720-9_1
9. Jesus, K. R. E. de, Torquato, S. A., Machado, P. G., Zorzo, C. R. B., Cardoso, B. O., Leal, M. R. L. V., Picoli, M. C. A., Ramos, R. C., Dalmago, G. A., Capitani, D. H. D., Duft, D. G., Suárez, J. G., Pierozzi, I., Trevelin, L. C., & Moreira, D. A. (2019). Sustainability assessment of sugarcane production systems: SustenAgro Decision Support System. In Environmental Development (Vol. 32, p. 100444). Elsevier BV. https://doi.org/10.1016/j.envdev.2019.05.003
10. Kumar, S., Kumar, M., Anuradha, K., Kumar, A., & Singh, A. (2017). Effect of Sugar Mill Effluents on Ground Water Quality. In International Journal of Current Microbiology and Applied Sciences (Vol. 6, Issue 12, p. 169). Excellent Publishers. https://doi.org/10.20546/ijcmas.2017.612.022
11. Meutıa, I., Yaacob, Z., & Kartasari, S. F. (2021). Sustainability reporting: An overview of the recent development. In Accounting and Financial Control (Vol. 3, Issue 1, p. 23). Business Perspectives. https://doi.org/10.21511/afc.03(1).2020.03
12. Murty, M. N., Kumar, S., & Paul, M. (2005). Environmental regulation, productive efficiency and cost of pollution abatement: a case study of the sugar industry in India. In Journal of Environmental Management (Vol. 79, Issue 1, p. 1). Elsevier BV. https://doi.org/10.1016/j.jenvman.2005.04.030
13. Peck, P., & Sinding, K. (2003). Environmental and social disclosure and data richness in the mining industry. In Business Strategy and the Environment (Vol. 12, Issue 3, p. 131). Wiley. https://doi.org/10.1002/bse.358
14. Perrini, F., & Tencati, A. (2006). Sustainability and stakeholder management: the need for new corporate performance evaluation and reporting systems. In Business Strategy and the Environment (Vol. 15, Issue 5, p. 296). Wiley. https://doi.org/10.1002/bse.538