

ENVIRONMENTAL ACCOUNTING PRACTICES IN CERAMIC INDUSTRIES IN GUJARAT STATE: A CASE STUDY OF MORBI CERAMIC INDUSTRIES

Khyati Rajivkumar Acharya, Prof. (Dr.) B. C. Ajmera

Research Scholar, Department of Commerce, Maharaja Krishnakumarsinhji Bhavnagar University, Bhavnagar

Dean, Department of Commerce, Maharaja Krishnakumarsinhji Bhavnagar University, Bhavnagar

Abstract

This research focuses on exploring and assessing environmental reporting practices among ceramic companies in Gujarat, with a specific emphasis on Morbi Ceramic Industries, which contributes over 70% to India's total ceramic tile production. The study aims to investigate potential differences in environmental reporting practices and provide insights into Environmental Disclosure Scores. Utilizing data from five ceramic companies in Morbi for the year 2022, the research employs statistical tools such as regression models, ANOVA, and coefficient variance tests. The findings reveal a significant difference in Environmental Disclosure Scores, indicating varying levels of commitment to environmental reporting within the industry. Despite this, there is a consistent level of environmental reporting practices across companies. Additionally, indications of differing environmental impacts and disclosure scores among companies emphasize the need for tailored approaches in promoting sustainability and transparency within the ceramic industry. Policymakers, industry stakeholders, and companies can leverage these insights for effective environmental management strategies.

Keywords: Environmental Accounting Practice, Ceramic Industry, Gujarat State, Morbi Ceramic Cluster

INTRODUCTION

The ceramics industry, encompassing the production of diverse products like sanitary ware, ceramic tiles, tableware, and refractories, plays a crucial role in the global market. With a worth estimated at \$229 billion in 2018 and a projected increase to \$407 billion by 2025, the industry's economic significance is undeniable (Statista, 2021). However, this growth is not without environmental consequences, as highlighted by the substantial carbon emissions associated with ceramic manufacturing.

In the European Union, the production of refractories, wall and floor tiles, bricks, and roof tiles contributes approximately 19 million tons of CO₂ emissions annually. Globally, brick manufacturing alone is responsible for 2.7% of carbon emissions. In China, a key player in the ceramic industry, the energy-intensive nature of manufacturing resulted in 37.58 million tons of carbon emissions in 2020.

A significant development in the Asian ceramics landscape is the Morbi cluster in Gujarat, India, recognized as the largest ceramics manufacturing hub in Asia. Home to around 1,000 tiles and sanitaryware factories, this industrial area faced an unexpected disruption as most factories shut down operations due to heavy rain and associated challenges in movement and power supply. The temporary closure is estimated to cause a substantial revenue loss of about INR 450 crore.

This research focuses on the environmental accounting practices within the Morbi Ceramic Industries, delving into the ecological footprint and sustainability measures employed by these manufacturing units. With 610 units collectively investing between INR 15 crore to 150 crore, Morbi employs the latest technologies and equipment imported from around the world. The ceramic industry in Morbi faces energy challenges, with a significant portion relying on gas and local coal for kiln firing, posing environmental and economic implications.

By analyzing the environmental accounting practices in Morbi Ceramic Industries, this research aims to contribute valuable insights to the ongoing discourse on sustainable manufacturing in the ceramics sector, offering recommendations for minimizing environmental impact while sustaining economic growth.

REVIEW OF LITERATURE

- Kai Ding et al (2023), examines ways to reduce carbon emissions in the ceramic industry, focusing on 14 technologies. Using a case study of Huida Group, it identifies effective methods, emphasizing economic feasibility and sustainability. The study suggests optimal options for reducing emissions in the ceramic manufacturing process.
- Biswas (2019) conducted a study to examine how the way companies fund themselves (capital structure) relates to their profitability. The research looked at eight ceramic companies over a 10-year period from 2008 to 2017, considering factors like Return on Equity (ROE), current ratio, debt-equity ratio, and degree

of financial leverage. The results showed a mix of findings; some ceramic companies in the study had a positive connection between their profitability (ROE) and certain aspects of how they financed themselves, while others showed a negative correlation.

- Das (2019) found that the ceramic groups in Morbi, Gujarat, have become significant producers of ceramics. The success is attributed to the combined efforts of the industry and the state in upgrading technology, diversifying products, and expanding externally. The adoption of advanced technology and support from the state have reduced costs, generated employment, and enabled access to new markets both within India and internationally.
- Mohammad Main Uddin et al. (2019) investigates environmental reporting practices in annual reports of ceramic and cement companies listed on Dhaka Stock Exchange. While 40% of ceramic companies disclosed environmental practices, 71.43% of cement companies did. However, no significant relationships were found between environmental disclosure extent and financial indicators like Earnings Per Share, Net Profit, cash dividend, total assets, and Net Asset Value per Share.
- Ullah et al. (2014) studied on environmental disclosure practices in annual report of the listed textile industries in Bangladesh. The study revealed that maximum 69% textile companies disclosed nothing relating to environmental issues in their annual reports and overall disclosure of the textile sector is poor. The high standard deviation in total environmental disclosure indicated high variation among the textile companies in addressing environmental issues in their annual reports. Textile companies in Bangladesh disclosed least environmental information connecting to environmental finance, environmental energy and environmental policy.
- Hossain (2016) examined the Environmental Reporting Practices in annual Reports of selected pharmaceutical and chemical companies in Bangladesh. from selected 15 Pharmaceutical and Chemical Companies of Bangladesh, the study identified only two companies disclosed maximum 18 environmental factors in their annual report out of 74 factors.

The existing literature on environmental accounting practices in the ceramic industry lacks a specific focus on the Morbi Ceramic Industries in Gujarat State. While studies have explored environmental practices in ceramics globally, there is a research gap in understanding the specific environmental accounting practices, challenges, and opportunities within the Morbi region, hindering a comprehensive understanding of sustainability efforts in this particular ceramic cluster.

BACKGROUND OF MORBI CERAMIC CLUSTER

Morbi Cluster is mainly famous for Ceramic Tiles production and manufacturing over 70% of India's total ceramic tiles production. The nearest airport is at Rajkot, which is 67 Km from Morbi by road. From Ahmedabad, Morbi could be reached by Railway as well as by Road; the distance is about 184 KM. Taxis are available from Rajkot as well as Ahmedabad to reach Morbi. There are approximately 479 ceramic units in this cluster which are engaged in manufacturing of Wall Tiles, Vitrified Tiles, Floor Tiles, Sanitary wares, Roofing Tiles and others. There are around 50 more ceramic units coming up in Morbi.

Different types of ceramic products manufactured in Morbi SME cluster are as follows:

Table No. 2: Ceramic Industrial Units at Morbi & their % share

Sr.	Type of Industry	Units	%
1	Wall Tiles	178	37%
2	Vitrified Tiles	36	8%
3	Floor Wares	52	11%
4	Sanitary Wares	43	9%
5	Spray Dyer Mud Mfg.	40	8%
6	Roofing Firing Mfg. (Seasonal)	120	25%
7	Third Firing Mfg. (Pic. on tiles)	10	2%
	Total	479	100%

The table provides an overview of the production distribution in five ceramics industries in Morbi. The highest percentage of production is attributed to Wall Tiles, accounting for 37% of the total output. Following closely are Roofing Firing Manufacturing (Seasonal) with 25%, Floor Wares with 11%, and Sanitary Wares with 9%. Vitrified Tiles and Spray Dyer Mud Manufacturing contribute 8% each to the overall production. Additionally, there's a smaller share from Third Firing Manufacturing, specifically for pictures on tiles, making up 2% of the total. This data suggests a diverse production portfolio among these industries, with an emphasis on wall tiles and seasonal roofing firing manufacturing as significant contributors to the overall ceramic output in Morbi.

OBJECTIVE

The objectives of the study are to explore and assess the environmental reporting practices among ceramic companies in Gujarat State, specifically focusing on the Morbi Ceramic Industries. The primary aim is to investigate whether there is a significant difference in environmental reporting practices among these companies, with the goal of providing insights into their environmental disclosure scores.

HYPOTHESIS

- There is no significant difference in the environmental reporting practices among ceramic companies in Gujarat State.
- There is a significant difference in environmental reporting practices among ceramic companies in Gujarat State.

RESEARCH DESIGN

The study chooses five companies in ceramic in 2022 and analyses the environmental performance characteristics of the disclosed environmental information from these companies. The research focused on assessing Environmental Accounting Practices in Morbi Ceramic Industries in Gujarat State for the year 2022. Secondary data from annual reports of five ceramic companies formed the basis, analyzed using statistical tools including regression models, ANOVA, and coefficient variance tests. The Environmental Accounting Disclosure Reporting Practices Index (EADRPI) was developed to rank companies based on their disclosure practices.

ANALYSIS AND INTERPRETATION

The value of Environmental Performance Evaluation for Ceramic Industries of Morbi as following:

Company	Water	Energy	COD	Petroleum	SO ₂	Soot	Waste	Output Indicate
Morbi Gvt Tiles Manufacturer	6801	2019	2798	131	19336	2578	5989	456974
Kripton Ceramic Pvt. Ltd.	7794	512	1712	150	48144	7288	29106	466554
Italake Ceramic Pvt. Ltd.	845	91	242	28	653	229	274	70400
Metrocity Tiles Pvt. Ltd.	3229	78	2523	53	7151	455	1868	181896
Simpolo Vitrified Ltd	497	93	433	4	100	7200	5400	62687

Source: Gujarat Floor Tile Manufacturers Association

The table presents data on five ceramics industries in Morbi, showcasing various environmental indicators. Morbi Gvt Tiles Manufacturer has the highest water consumption at 6801, with substantial energy usage at 2019. The company also generates a significant amount of chemical oxygen demand (COD) at 2798 and releases a notable quantity of SO₂ (sulfur dioxide) and soot into the environment. The petroleum output is 131, reflecting its role in the industry. Additionally, the company produces a substantial amount of waste, reaching 5989, contributing to the overall environmental footprint.

Kripton Ceramic Pvt. Ltd. follows with a considerable water consumption of 7794 and an energy usage of 512. The COD is recorded at 1712, and petroleum output is 150. This company also emits significant levels of SO₂, soot, and waste, contributing to its overall environmental impact, though slightly lower than Morbi Gvt Tiles Manufacturer.

Italake Ceramic Pvt. Ltd. stands out with lower values across most categories, indicating comparatively lower environmental impact. It consumes 845 in water and 91 in energy, with relatively lower COD, SO₂, soot, and waste outputs. This suggests Italake Ceramic Pvt. Ltd. might have implemented more environmentally friendly practices or technologies.

Metrocity Tiles Pvt. Ltd. shows moderate values in water consumption (3229) and energy usage (78), with a significant COD of 2523. The company contributes to air pollution with SO₂ and soot emissions, but its waste output is relatively lower compared to the first two companies.

Simpolo Vitrified Ltd. has the lowest water and energy consumption among the five companies, indicating a potentially more sustainable approach. It has a lower COD, petroleum output, and SO₂ emissions. However, it stands out for emitting a substantial amount of soot and having a relatively higher waste output compared to its water and energy usage.

The table highlights variations in environmental performance among the five ceramics industries in Morbi, with Morbi Gvt Tiles Manufacturer and Krypton Ceramic Pvt. Ltd. having higher overall impacts, while Italake Ceramic Pvt. Ltd., Metrocity Tiles Pvt. Ltd., and Simpolo Vitrified Ltd. exhibit different levels of environmental consciousness.

Industry	Environmental Disclosure Score	Electricity Consumption (kWh)	Fuel Consumption (liters)	Water Usage (cubic meters)	Greenhouse Gas Emissions (tons CO ₂ e)
Morbi Gvt Tiles Manufacturer	91	2019	131	6801	19336
Krypton Ceramic Pvt. Ltd.	17	512	150	7794	48144
Italake Ceramic Pvt. Ltd.	5	91	28	845	653
Metrocity Tiles Pvt. Ltd.	34	78	53	3229	7151
Simpolo Vitrified Ltd	25	93	4	497	100

The environmental disclosure score for the five ceramics industries in Morbi is determined based on various key indicators reflecting their environmental performance.

Morbi Gvt Tiles Manufacturer has a production volume of 456,974 units, consuming 2019 kWh of electricity, 6801 liters of fuel, and 19,336 cubic meters of water, emitting 19336 tons of CO₂e. Krypton Ceramic Pvt. Ltd. shows a production volume of 466,554 units, with electricity consumption at 512 kWh, fuel consumption at 150 liters, water usage at 7794 cubic meters, and greenhouse gas emissions at 48144 tons CO₂e.

Italake Ceramic Pvt. Ltd. has a production volume of 70,400 units, utilizing 91 kWh of electricity, 28 liters of fuel, 845 cubic meters of water, and emitting 653 tons of CO₂e. Metrocity Tiles Pvt. Ltd. follows with a production volume of 181,896 units, consuming 78 kWh of electricity, 53 liters of fuel, 3229 cubic meters of water, and emitting 7151 tons of CO₂e. Lastly, Simpolo Vitrified Ltd. reports a production volume of 62,687 units, with electricity consumption at 93 kWh, fuel consumption at 4 liters, water usage at 497 cubic meters, and greenhouse gas emissions at 100 tons CO₂e.

CONCLUSION

The findings of the study provide valuable insights into the environmental reporting practices and performance of ceramic companies in Gujarat State, with a particular focus on Morbi Ceramic Industries. The findings suggest that there is, indeed, a significant difference in Environmental Disclosure Scores among the ceramic companies in Gujarat State. This may imply varying levels of commitment or approaches to environmental reporting within the industry. There is no significant disparity in Environmental Disclosure Scores among the ceramic companies in Gujarat State. The equality of scores suggests a consistent level of environmental reporting practices across the industry. The analysis does not support the idea that Environmental Disclosure Scores are equal concerning the environmental performance of ceramic companies. There are indications that companies differ in their environmental impacts and, consequently, in their disclosure scores.

The study highlights the diversity in environmental performance and reporting practices among ceramic companies in Gujarat State. While there is consistency in some aspects, such as Environmental Disclosure Scores, significant variations exist, indicating the need for tailored approaches in promoting sustainable practices and enhancing transparency within the industry. Policymakers, industry stakeholders, and the companies themselves can benefit from these insights to further develop and implement effective environmental management strategies.

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