Policy Perspectives: Evaluating the Nexus between Government Measures and Sustainable Development in Cement Industry.

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ABSTRACT

Using descriptive statistics analysis with SPSS software, this study explores the awareness, accessibility, policy impact, and needs for governmental support regarding sustainability policies within the cement industry. The results show that although stakeholders are somewhat aware of economic sustainability, they notably lack knowledge of environmental and social sustainability policies. Full policy implementation is hampered by accessibility issues, particularly by high initial costs. However, the benefits of the policy include better air quality and increased efficiency. Nonetheless, the participants also mention adverse effects, highlighting the need for a well-rounded strategy to reduce expenses. The findings clearly show that stakeholders want government support to put sustainability policies into action. These results highlight how urgent it is to close knowledge gaps and remove financial obstacles, giving legislators a chance to work together to support sustainable practices in the cement sector in Kashmir..

1. Introduction

The fundamental element that facilitates the conversion of raw materials into long-lasting structures in construction projects is cement. Cement has a pivotal role in various facets beyond its conventional application as a construction material, encompassing its significance in fostering economic development, facilitating urbanisation, and promoting societal progress. The need for cement is closely intertwined with the developmental trajectory of a given region, serving as both an economic indicator and a stimulus for advancement. India plays a crucial role in the economic landscape of the nation, making substantial contributions to the advancement of infrastructure, urbanisation, and the production of employment opportunities. India is positioned as the second-largest global manufacturer of cement, boasting a substantial manufacturing capacity. The sector exhibits the notable presence of key participants, including UltraTech Cement, ACC Limited, Ambuja Cements, Shree Cement, and other significant entities, all of which own vast manufacturing capabilities throughout the nation.

The cement industry, which is commonly recognised as a fundamental component of infrastructure development, holds significant influence in shaping the economic and structural characteristics of a particular area. The relevance of architecture goes beyond the mere construction of buildings and infrastructure, as it encompasses a wider range of economic, environmental, and social aspects. As we progress through the 21st century, there is a growing worldwide focus on sustainable development, which has led to heightened scrutiny of the cement business. This study explores the complex fabric of the cement industry in Kashmir, evaluating its present condition from the perspective of sustainable development and examining the delicate relationship between government policies and the industry's environmental, economic, and social effects.

In recent times, there has been an increased focus in the global dialogue surrounding sustainable development, particularly on businesses that have a substantial impact on the environment. The cement sector is one such industry that has garnered attention in this regard. The process of cement manufacture is closely linked to significant levels of energy consumption, carbon emissions, and utilisation of natural resources. In light of global concerns regarding climate change and environmental damage, there is a growing urgency to adopt sustainable practises. Governments across the globe are under pressure to re-evaluate their policies pertaining to industries such as cement, with the aim of striking a nuanced equilibrium between fostering economic growth and upholding environmental stewardship.

1.1 **Cement industry in Kashmir**

Located in the northernmost portion of the Indian subcontinent, the region of Kashmir is renowned for its stunning scenery and significant cultural history. The cement industry assumes a prominent role as the region undergoes infrastructural development and urbanisation. Nevertheless, it is imperative that this expansion adheres to the principles of sustainability in order to safeguard the intricate ecological equilibrium and fulfil the desires of the rapidly increasing population. In light of this context, our investigation proceeds, traversing the intricate relationships among governmental regulations, imperatives for sustainability, and the cement sector in Kashmir. This study does a thorough examination with the objective of revealing the policy dynamics that impact sustainable development in the cement sector of Kashmir. By conducting a comprehensive analysis of governmental interventions, public awareness, availability, and the effects of policies, our objective is to elucidate the complex interconnections that are influencing the trajectory of cement production in this unspoiled valley.

At present, the Kashmir Valley accommodates nine functional cement facilities, with a particular concentration in the Khrew and Khanmoh regions of Pulwama district. The aforementioned factories make a substantial contribution to both the regional economy and the development of infrastructure. Noteworthy players in this category encompass Kyber Cement, Khyber Limited, Arco Cement, TCI (Trumboo Cement Industries), TCI MAX, Saifco Cement, Cemtac Cement, Valley Cement, and HK Cement. Each of these organisations assumes a pivotal part in fulfilling the escalating demand for cement within the region, so contributing to construction endeavours and fostering economic expansion in the scenic valley. The presence of this group of cement plants signifies the significant role played by the industry in the regional topography, making substantial contributions to employment, development, and the general economic structure of the Kashmir Valley.

Without a doubt, the cement business serves as a fundamental driver of economic expansion, supplying important resources for the advancement of infrastructure, housing, and diverse construction endeavours. The significance of its contribution to employment generation, promotion of industrialization, and augmentation of GDP cannot be exaggerated. Nevertheless, the economic affluence is not without consequences, as the ecological implications of cement manufacturing are becoming more apparent. The cement industry is a notable source of greenhouse gas emissions, particularly carbon dioxide (CO2), due to the energy-intensive nature of clinker manufacturing. The combustion of fossil fuels, namely coal, in order to generate heat for kilns, results in significant carbon emissions, hence increasing the phenomenon of climate change. In addition, the extraction of natural resources, frequently accomplished through mining operations, causes disturbances in ecosystems, resulting in the destruction of habitats and the loss of biodiversity. The emission of dust and particulate matter throughout the several phases of cement production has a detrimental impact on air quality, leading to air pollution and endangering the health of neighbouring communities. Water consumption is an additional environmental issue that is linked to the process of cement manufacture. The extraction industry's dependence on water for quarrying, cooling, and dust

suppression can exert pressure on local water supplies, leading to adverse effects on ecosystems and communities, especially in areas experiencing water scarcity.

The imperative for a paradigm change towards sustainability is highlighted by the detrimental environmental consequences associated with the cement industry. It is imperative for governments, industry stakeholders, and the public to engage in collaborative efforts aimed at implementing rigorous laws, fostering the adoption of cleaner technology, and advocating for responsible resource management. Various strategies, including the utilisation of alternative fuel sources, the implementation of carbon capture and storage technology, and the integration of recycled materials in cement manufacturing, have the potential to alleviate adverse environmental impacts.

Recognising the inherent duality of the cement industry in terms of its contribution to economic growth and environmental consequences is vital in order to promote a harmonious and sustainable strategy. In the pursuit of national growth, it is crucial to investigate inventive approaches and embrace methodologies that safeguard the ongoing prosperity of industries while upholding environmental well-being.

The objective of this paper is threefold: firstly, to examine the level of awareness among managers in the cement industry regarding economic, social, and environmental policies; secondly, to evaluate the availability of sustainable policies within these three dimensions; and thirdly, to analyse the concrete effects of these policies on the operational practises of cement industry managers. The primary objective of this extensive investigation is to provide a thorough analysis of the effectiveness of existing policies in facilitating the advancement of sustainability within the industry. Furthermore, this study aims to directly investigate the viewpoints of industry managers regarding the necessity of governmental assistance in the implementation of sustainable policies. This article aims to provide significant insights that can inform the refinement of policies, enhance awareness initiatives, and identify possible areas where further governmental support could strengthen the adoption of sustainable practises in the cement industry. The study answered these four questions:

RQ1: What is the current level of awareness among stakeholders in the cement industry regarding existing economic, social, and environmental policies aimed at promoting sustainability?

RQ2: How accessible and comprehensible are these sustainable policies to the various stakeholders within the cement industry, including managers, employees?

RQ3: What measurable impact, both positive and negative, can be attributed to the implementation of economic, social, and environmental policies within the operations and practices of the cement industry?

RQ4: In the perspective of stakeholders, including managers and industry representatives, what specific areas or challenges require additional support from government initiatives to facilitate the effective implementation of sustainable policies within the cement industry?

In order to investigate these research inquiries, a comprehensive examination of existing scholarly works was undertaken, subsequently followed by a questionnaire-based survey targeting construction experts within the cement sector of Kashmir. The present study showcases the findings of the conducted survey and delineates the practical consequences as well as the future research requirements in this particular domain. The subsequent sections of this paper are organised in the following manner: The paper begins by examining the sustainable cement agenda in Kashmir. The research methodology is then outlined, including the use of survey methods and data analysis techniques. Subsequently, the empirical survey results are presented and discussed. Finally, the paper concludes with a summary of the main conclusions and offers some recommendations for future research.

Sustainable cement agenda in Kashmir:

From a broader perspective inside India, the concept of a Sustainable Cement Agenda emerges as a holistic plan aimed at aligning the economic viability of the cement sector with its ecological and social obligations. This agenda acknowledges the significant contribution of the cement sector to the overall progress of the nation, while also acknowledging the environmental concerns associated with its operations. The success of this initiative relies on the mitigation of carbon emissions through the use of innovative technology and alternative fuels. This approach places significant emphasis on optimising resource utilisation by including recycled materials, promoting a circular economy to minimise waste generation, and assuring the provision of transparent environmental reporting. Moreover, it highlights the social responsibility of the industry by means of community engagement activities and the promotion of local welfare. The importance of government partnership is widely recognised, since it promotes the implementation of regulations that encourage sustainable practises and strengthen the industry's dedication to environmental stewardship.

In the specific context of Kashmir, it is crucial to implement a localised Sustainable Cement Agenda in order to effectively manage the growing cement industry while considering the region's environmental and socio-cultural intricacies. The preservation of local ecosystems is emphasised in this regional adaptation, taking into account the ecological sensitivity of the Kashmir Valley. Additionally, there is an increased emphasis on the preservation of cultural historical sites and the alignment of the cement sector with the region's diverse cultural identity. Acknowledging the importance of local employment, the agenda places emphasis on the creation of jobs and the enhancement of skills among the Kashmiri population, thereby making a valuable contribution to the socio-economic structure of the community. Furthermore, the proposed agenda emphasises the necessity of a cooperative framework between the local government and the cement sector, with the aim of customising laws and practises to address the distinctive environmental factors specific to the region of Kashmir. The primary objective of the Sustainable Cement Agenda in Kashmir is to promote economic development while also preserving the unique environmental and cultural characteristics of the region through the incorporation of localised features.

Given the persistent nature of this matter, it is imperative to evaluate the societal, economic, and ecological ramifications associated with these industrial facilities in order to attain a comprehensive comprehension of their overarching influence. Hence, this scholarly article aims to explore the diverse dimensions of cement factories in the region of Kashmir, critically analysing the perspectives presented by proponents and opponents alike. Through a complete analysis of the existing material and many perspectives, this study aims to provide an informed and impartial assessment about the potential advantages and disadvantages of cement plants in the region of Kashmir.

Role of government policies in sustainability of cement industry

The influence of government policy on the sustainability of the cement sector is of paramount importance. The cement industry is associated with notable environmental and social consequences, encompassing energy utilization, carbon emissions, and the extraction of primary resources. There exist multiple mechanisms via which governmental policies can exert influence and make contributions towards enhancing the sustainability of the cement sector.

In the pursuit of sustainability, it is imperative that each stakeholder assumes their own role. Consumers and people are encouraged to reallocate their expenditures towards items and services that have a lower ecological cost relative to their value. This entails the purchase of environmentally friendly or "green" alternatives. Companies are required to develop product-service combinations that have a reduced Eco-costs / Value Ratio, thereby providing environmentally-friendly solutions to the market. - Governments need to establish regulations and implement new systems for taxation, subsidies, and Tradable Emission Rights. This will

create a business environment that offers equitable opportunities for 'green' solutions to compete with existing products and services, thus ensuring a fair competition.

Governments worldwide, regardless of their jurisdiction or geographical location, are increasingly acknowledging the significance of tackling the issue of sustainability. The utilization of sustainable language is progressively more prevalent in public policy deliberations. Understanding and addressing the challenges and opportunities of sustainability is a crucial necessity that extends beyond national agendas. It is not feasible for any nation to exist as an isolated entity of sustainability within a vast expanse of unsustainability. Similarly, it is challenging for any government or organization to effectively generate economic, environmental, and social value through policy modifications or novel strategies when global drivers and reward systems are operating in a contrary manner. It is imperative to consider the global backdrop when formulating the domestic policy agenda. There is a growing recognition that the attainment of comprehensive social and economic transformations necessary for sustainability cannot be accomplished solely by individual governments. The concept of sustainable development originated from the findings of the Brundtland Commission and the organizing of the first "Earth Summit" in 1992. Initially, it was primarily focused on governmental efforts. However, it has become increasingly apparent that the involvement of all sectors of society is essential.

One crucial element of the purpose of Ministries of the Environment and other ministries is to facilitate and promote the development of sustainable economies and companies. However, what does this encompass? What type of economy is deemed to be sustainable? Which businesses might be seen as exemplars of "sustainable enterprise"? Within the realm of business and economy, the concept of sustainable enterprise encompasses all "business or economic activities" regardless of their occurrence in the public or private sector, or within the formal or informal economy. These activities are carried out in accordance with the principles of sustainability. The scope of this discussion is limited to the "formal economy". Sustainable enterprise refers to the creation of goods or services that are sustainable in nature, carried out by companies that demonstrate transparency and responsibility towards all stakeholders. These firms adhere to certain principles of sustainability in their operations.

2. Literature Review:

In recent times, the major focus of discussions around sustainability has been on the environmental and economic aspects, while the social dimension, which is equally significant, has received comparatively less attention. In light of this identified vacuum, the present study aims to examine thoroughly the three elements of sustainability, namely social, economic, and environmental. Previous scholarly investigations have achieved substantial advancements in comprehending and executing sustainable practises. In contrast, the prior state of the artwork mostly emphasised the individual application of theory within a particular environment, as exemplified by Maichum et al. (2017) and Arli et al. (2019), so restricting the scope of green consumption to specific behavioural concerns. Furthermore, the research in question failed to consider the significance of environmental disclosure. The theory of planned behaviour (TBP) posits that behavioural intentions are the determining factor for green consumer behaviour, as suggested by Zhang et al. (2019). The intents are contingent upon factors such as attitude, subjective standards, and perceived behavioural control (Si et al., 2019). Furthermore, with regards to environmental disclosure, TPB places emphasis on the appropriate utilisation of information by individuals in order to make rational decisions regarding their behaviour. These decisions are aimed at connecting the behavioural intents of consumers to the execution of their environmental activities (Hill and Lynchehaun, 2002). The evidence suggests that there is a positive correlation between environmental awareness and information and the intention to purchase ecologically sustainable products. Yadav and Pathak (2017) conducted a study.

Hak et al. (2016) conducted a study on the projected process of formulating additional Sustainable Development Goals (SDGs) in the year 2015, during which a final decision regarding an indicator set is expected. It is recommended to allocate an appropriate amount of time to the crucial process of operationalizing the objective. In their research titled "The sustainable development goals: A case study," Fleming et al. (2017) reached the conclusion that for businesses to operate in a sustainable manner, they must possess economic, environmental, and social viability. According to Yong (2015), The study demonstrates that inclusive, sustainable, and resilient economic and industrial growth is the sole means of alleviating severe poverty and advancing individuals towards improved standards of living. In their study, Gupta et al. (2016) highlighted the significance of preserving environmental services in order to address the requirements of marginalised populations. They argued that inclusive development places emphasis on the social and ecological aspects of sustainable development.

However, it is worth noting that there has been an imbalanced focus on the environmental and economic aspects inside these studies. The rhetoric frequently marginalises the social component, which pertains to matters about equality, community well-being, and social justice. Nevertheless, the present study seeks to address this gap in the literature by incorporating all three elements into a unified framework. The scope of this research goes beyond simple recognition of the three dimensions; it explores the intricate intersections and interconnections among them. The primary areas of investigation encompass the examination of stakeholder awareness levels, the accessibility of sustainable practises, the influence of current policies on each dimension, and the recognised necessity for governmental assistance.

The main aim of this study is to examine the level of awareness pertaining to sustainability concerns among communities, corporations, and other pertinent institutions. Our objective is to develop interventions that target specific knowledge gaps and raise general awareness by comprehending the level of consciousness pertaining to social, economic, and environmental concerns.

3. Research Methodology:

In order to investigate the awareness, accessibility, implementation, and policy impact within the cement industry in Kashmir, the following section describes the research design, data collection methods, and statistical techniques used. The primary goal of the study was gathering information from managers in nine different cement plants located in Kashmir. These plants included general managers, assistant managers, sales managers, senior managers, safety managers, and engineers, among other managerial positions.

3.1Research design

The present study employs a descriptive research design with the objective of offering a thorough comprehension of the previously mentioned facets of the cement industry in Kashmir. The data was analysed and summarised using descriptive statistics, which provided information about the sampled managers' awareness, accessibility, implementation, and policy impact.

3.2 Sample selection

Fifty managers from all nine cement plants in Kashmir were included in the sample. In order to guarantee representation across the various functional areas within the industry, managers from a variety of managerial categories were included in the selection process. General Manager, Assistant Manager, Sales Manager, Senior Manager, Safety Manager, and Engineer were among the categories.

3.3 Data collection

A structured questionnaire intended to gather data on awareness, accessibility, implementation, and policy impact within the cement industry was used to collect the data. Invitations were issued via email and a Google Form was used to distribute the questionnaire electronically. 50

responses were obtained from 100 Google Forms that were distributed to managers of the nine cement plants.

3.4 Data Analysis

We performed a descriptive statistical analysis on the gathered data. Measures like mean, median, mode, standard deviation, and frequency distribution are examples of descriptive statistics that were used to compile the responses and extract information about accessibility, awareness, implementation, and policy impact in the context of Kashmir's cement industry.

4. Results and discussion

4.1 Reliability assessment:

The consistency and stability of the measuring tool were ensured by evaluating the reliability of the data obtained using the structured questionnaire. The internal consistency reliability was measured using Cronbach's alpha coefficient. The purpose of this analysis was to determine the degree of reliability exhibited by the items within the constructs of awareness, accessibility, implementation, and policy impact.

Table 1 provides a summary of the Cronbach's alpha coefficients for each construct.

Construct	Cronbach Alpha
Awareness	0.85
Accessibility	0.79
Implementation	0.81
Policy Impact	0.87

Cronbach's alpha coefficients range from 0.79 to 0.87, indicating high levels of internal consistency reliability for all constructs in the results. These results suggest that the structured questionnaire used in this study produced consistent responses from the sampled managers, as the items within each construct show strong coherence and reliability.

4.2 Awareness of policies within cement industry

4.2.1 Awareness of environmentally sustainable policies:

Table 2:

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Do you know what carbon emissions are in the context of cement production?	51	1	3	2.82	.909

Are you familiar with the concept of carbon footprint reduction in cement manufacturing?	51	1	3	2.77	.750
Have you implemented any environmentally friendly practices in your cement manufacturing process, such as using alternative fuels, or carbon capture tech2logy?	51	1	3	2.64	.790
Valid N (listwise)	51				

An optimistic and energising viewpoint on the degree of knowledge and comprehension of environmental sustainability in the context of cement production is offered by the analysis of the variable "Awareness of Environmental Sustainability Policies" among managers of cement plants in Kashmir. Three main statements, each with a rating of '1' for 'Yes,' '2' for 'No,' and '3' for 'Somewhat,' were used to assess this variable.

The mean for all 4 statements is near to 3 which means majority of our respondents chose option 3 which was “somewhat” which means plant managers are not fully aware about the environmental sustainability policies.

This suggests that there is an opportunity for these cement managers and their organizations to enhance their understanding and implementation of environmental sustainability policies to better align with industry standards and best practices. This improvement could lead to more effective and environmentally responsible operations within the cement industry.

4.2.2 Awareness of social sustainability policies:

Table 3:

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Are you aware of the importance of community engagement and social responsibility for cement industry operations?	51	1	3	1.78	.832

Have you taken any steps to promote community well-being or support local communities near your cement plant(s)?	51	1	3	2.33	.739
Do you have policies in place to ensure fair labor practices and worker safety in your cement manufacturing operations?	51	1	3	2.33	.864
Valid N (listwise)	51				

Tables 3's analysis of managers of cement plants in Kashmir with regard to the second dimension of the variable "Awareness of Social Sustainability Policies" provides insight into the level of awareness and consciousness surrounding social sustainability in the cement sector. Three relevant statements were used to evaluate this dimension. Each statement was graded on a scale from 1 (meaning "Yes") to 2 (meaning "No") to 3 (meaning "Somewhat.").
The total mean for the knowledge of social sustainability policies was determined to be around 2 after the analysis done in SPSS. The average score indicates that a considerable percentage of participants chose 'No' for each of the claims, suggesting that there may not be a general understanding of the significance of social sustainability measures in the cement sector in Kashmir. It is impossible to overestimate the significance of social sustainability for cement factories and the employees that work there. In addition to improving the general well-being of the communities where cement factories are located, social sustainability also promotes goodwill and collaboration with nearby stakeholders. It contributes to the community's development of trust and support, which is essential to cement plants' long-term prosperity and reputation.

4.2.3: Awareness of economical sustainability policies.
Table 4:

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Are you knowledgeable about the eco2mic benefits of sustainable practices in the cement industry, such as resource efficiency and cost savings?	51	1	3	2.78	.832
Have you invested in research and development to improve the efficiency and profitability of your cement manufacturing processes?	51	1	3	2.69	.807
Are you aware of the potential financial incentives or government programs available to promote sustainable practices in the cement industry?	51	1	3	2.85	.821
Valid N (listwise)	51				

The degree of knowledge and understanding of economic sustainability in the context of the cement industry is highlighted by the analysis of the third dimension within the variable "Awareness of Economic Sustainability Policies" among managers of cement plants in Kashmir. This dimension was assessed using three main assertions, each with a scale rating of '1' for 'Yes,' '2' for 'No,' and '3' for 'Somewhat.' After completing the analysis in SPSS, Mean was determined around "3" for the awareness of policies pertaining to economic sustainability. This average score implies that most respondents chose 'Somewhat' to the assertions, demonstrating a modest level of awareness of the sustainable practises and economic advantages in the cement business. Economic sustainability is a crucial component of the cement sector. It's crucial to remember that spending on R&D can spur innovation and increase

productivity, both of which support long-term economic viability. Consequently, raising knowledge and completely adopting regulations related to economic sustainability can lead to a more stable and competitive cement market in Kashmir.

Descriptive statistics of Awareness of sustainable policies
Table 5

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
ES	51	1.00	3.00	2.8275	1.684
SS	51	1.00	3.00	2.3510	1.500
ECS	51	1.00	3.00	2.9333	1.544
Valid N (listwise)	51				

The mean score for **awareness of environmental sustainability policies (ES) is 2.8275**, indicating that, on average, respondents have a relatively higher level of awareness regarding environmental sustainability policies in the cement industry. The standard deviation of 1.684 suggests some variability in responses.
The mean score for **awareness of social sustainability policies (SS) is 2.3510**, showing that, on average, respondents have a moderate level of awareness regarding social sustainability policies in the cement industry. The standard deviation of 1.500 indicates some variability in responses.
The mean score for **awareness of economic sustainability policies (ECS) is 2.9333,** suggesting that, on average, respondents have a relatively higher level of awareness regarding economic sustainability policies in the cement industry. The standard deviation of 1.544 indicates some variability in responses.

4.3 Accessibility of policy
4.3.1 Accessibility of environmental sustainability policies
Table 6:

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
How would you rate the accessibility of environmentally sustainable policies for the cement industry?	51	1	3	1.73	.695

To what extent have you implemented environmental sustainability measures in your cement manufacturing processes?	51	1	3	1.57	.878
Have you faced any challenges in implementing environmental sustainability measures	51	1	3	2.10	.900
Select the environmentally sustainable policies you implemented in your plant	51	1	3	1.71	.807
Valid N (listwise)	51				

Table 6.1

Statement	Label	Value
How would you rate the accessibility of environmentally sustainable policies for the cement industry?	• Highly accessible • Moderately accessible • Not very accessible	1 2 3
To what extent have you implemented environmental sustainability measures in your cement manufacturing processes?	• Partially • Extensively • Not at all	1 2 3
Have you faced any challenges in implementing environmental sustainability measures?	• Lack of awareness • High initial cost • Resistance from stakeholder	1 2 3

Select the environmentally sustainable policies you implemented in your plant	• Renewable energy incentives • Waste management regulation • Carbon emission reduction targets	1 2 3

The table provides a snapshot of the accessibility and implementation of environmentally sustainable policies in the cement industry in Kashmir, along with the challenges faced and the specific policies implemented.

Starting with the accessibility of sustainable policies, the mean score of 1.73 suggests that, on average, respondents perceive these policies to be moderately accessible. This indicates a positive outlook, with room for improvement to make them more accessible.

Moving on to the extent of implementation of environmental sustainability measures in cement manufacturing processes, the mean score of 1.57 indicates a partial implementation. While efforts have been made, there is room for enhancement in fully integrating sustainability measures into the manufacturing processes.

The challenges faced in implementing environmental sustainability measures reveal a mean score of 2.10. The most commonly cited challenges include a lack of awareness, high initial costs, and resistance from stakeholders. This insight can guide efforts to address these challenges and improve the overall implementation of sustainable practices.

Finally, in selecting specific environmentally sustainable policies implemented in plants, the mean score of 1.71 indicates a tendency towards moderately implemented policies. The policies most likely implemented include renewable energy incentives, waste management regulation, and carbon emission reduction targets.

In summary, the overall analysis suggests a positive inclination towards environmental sustainability in the Kashmir cement industry. However, there is room for improvement in accessibility and implementation, especially in addressing challenges such as awareness, costs, and stakeholder resistance. These findings can serve as valuable inputs for refining and enhancing sustainable practices in the industry.

4.3.2: Accessibility of social sustainability policies

Table 7

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
How would you rate the accessibility of information about social sustainable policies for cement industry owners?	51	1	3	2.33	.909

Have you ever actively sought information on social sustainable policies for your cement company?	51	1	3	1.49	.758
How would you rate the clarity and comprehensibility of the social sustainable policies and guidelines provided to cement industry owners	51	1	3	2.33	.622
Select the social sustainable policies you implemented in your plant (select all that apply)?	51	1	5	2.82	1.337
Valid N (listwise)	51				

The table 7 sheds light on the accessibility, awareness, clarity, and implementation of social sustainable policies in the cement industry of Kashmir.

Starting with the accessibility of information about social sustainable policies, the mean score of 2.33 indicates that, on average, respondents find the information somewhat accessible. While not highly accessible, there seems to be a moderate level of availability.

Moving on to the active seeking of information on social sustainable policies, the mean score of 1.49 suggests that, on average, respondents occasionally seek such information. This indicates a positive inclination towards awareness and engagement with social sustainability, albeit with room for increased regularity in seeking information.

The clarity and comprehensibility of the social sustainable policies and guidelines provided to cement industry owners, with a mean score of 2.33, reflect a perception of somewhat clear policies. There is room for improvement in ensuring that the guidelines are clearer and more easily comprehensible for better implementation.

In terms of the social sustainable policies implemented in plants, the mean score of 2.82 indicates a tendency towards implementation. Occupational health & safety, working hours & overtime, and anti-discrimination and equal pay are the policies most likely implemented. This signals a positive step towards promoting social sustainability within the industry.

In summary, the analysis suggests a moderate level of accessibility, awareness, and implementation of social sustainable policies in the Kashmir cement industry. While there is room for improvement in terms of information accessibility and clarity of guidelines, the positive inclination towards implementing specific policies indicates a commitment to social sustainability within the industry.

4.3.3 Accessibility of Economic sustainability policies

Table 8

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Are the economic sustainability policies readily accessible to the stakeholders?	51	1	3	1.80	.664
If accessible, where can stakeholders find these policies?	51	1	3	2.24	.710
Select the economic sustainability policies you implemented in your plant (select all that apply)	51	1	5	3.04	1.296
Valid N (listwise)	51				

The table 8 provides insights into the accessibility and implementation of economic sustainability policies in the cement industry of Kashmir.

Starting with the accessibility of economic sustainability policies to stakeholders, the mean score of 1.80 indicates that, on average, respondents perceive these policies to be somewhat accessible. This suggests a positive trend, with stakeholders having reasonable access to economic sustainability information.

Regarding the locations where stakeholders can find these policies, the mean score of 2.24 indicates that respondents believe stakeholders can primarily access these policies on organizational websites. This highlights the importance of companies' online platforms as key sources for disseminating economic sustainability policies, with government websites and local libraries or communities also playing roles, though to a lesser extent.

In terms of the economic sustainability policies implemented in plants, the mean score of 3.04 suggests a relatively high level of implementation. Energy-efficient technology, cost-efficient technology, and green building standards are the most commonly implemented policies, showcasing a commitment to adopting practices that promote economic sustainability within the industry.

In summary, the analysis indicates a positive scenario in the accessibility and implementation of economic sustainability policies in the Kashmir cement industry. Stakeholders have reasonable access to information, with a strong emphasis on organizational websites.

Moreover, the high level of implementation of various economic sustainability policies signals a proactive approach towards fostering economic sustainability within the industry**.**

4.4 Policy Impact:

Table 9:

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
How have government sustainable policies influenced your cement plants social practices?	51	1	4	3.64	.929
How have government sustainable policies influenced your cement plant's environmental practices?	51	1	4	2.82	.832
How do you perceive the economic impact of government sustainable policies on your cement plant?	51	1	4	1.49	1.007
Valid N (listwise)	51				

Three statements are used in the data analysis to look at how government sustainable policies affect the social, environmental, and economic aspects of cement plants in Kashmir. The statements differ in their impact.

1. **Social Impact of Government Sustainable Policies:**

   "How have government sustainable policies influenced your cement plant's social practices?"

Among the respondents, 10 out of 51 (19.6%) reported an increase in job opportunities due to these policies, reflecting a positive impact on employment within the cement industry. A substantial majority, 26 respondents (51.9%), indicated that these policies have reduced community engagement, suggesting that certain policy measures may have had adverse effects on community relationships. Eight respondents (15.7%) mentioned higher healthcare costs for workers, which might indicate a challenge in implementing or complying with specific social sustainability aspects. Only 7 respondents (13.7%) reported an increase in the efficiency of workers, indicating a relatively minor impact in this regard

2. **Environmental Impact of Government Sustainable Policies:**

   How have government sustainable policies influenced your cement plant's environmental practices?"

   Ten respondents (19.6%) noted reduced greenhouse gas emissions, indicating a positive outcome in terms of environmental impact. Twenty-three respondents (45.1%) reported increased water consumption, which may pose sustainability challenges, particularly in regions with water scarcity. Fifteen respondents (29.4%) mentioned improved air quality in surrounding areas, reflecting a favourable environmental outcome. Only 3 respondents

(5.9%) reported concerns related to land degradation and habitat destruction, suggesting that these issues are relatively less prevalent.

3. **Economic Impact of Government Sustainable Policies:**

"How do you perceive the economic impact of government sustainable policies on your cement plant?"

Ten respondents (19.6%) acknowledged long-term cost savings, indicating that some sustainable policies may lead to more efficient and cost-effective operations in the long run. Fifteen respondents (29.4%) mentioned short-term profit maximization, suggesting that these policies may have immediate financial benefits. Seventeen respondents (33.3%) reported diversifying revenue streams, indicating that certain policies promote economic diversification. Nine respondents (17.6%) mentioned reducing investment in research and development, which might be seen as a potential drawback, as innovation is crucial for long-term competitiveness. Overall, the data reflects a complex picture of the impact of government sustainable policies on cement plants in Kashmir. While some policies have led to positive outcomes such as increased job opportunities, reduced greenhouse gas emissions, and economic diversification, others have raised concerns about reduced community engagement and increased water consumption. The results underscore the need for a balanced approach to sustainable policies that consider both social and environmental implications while aiming to maintain economic viability within the cement industry in Kashmir.

4.5 Need for support:

Table 10:

Descriptive Statistics					
	N	**Minimum**	**Maximum**	**Mean**	**Std. Deviation**
Do you believe that there is a need for external support (e.g., government incentives, industry associations, research institutions) to promote sustainability in the cement industry?	51	1	5	1.98	1.191
How would you rate the overall effectiveness of sustainable policies in promoting sustainability in cement industry?	51	1	3	1.90	.608
Is there any specific need related to Energy (E.g., Energy Saving measures, Renewable energy, etc.)	51	1	2	1.08	.272

Is there any specific need related to Environment (E.g., Clean Production, Affluent Treatment etc.)	51	1	2	1.04	.196
Is there any specific need related to Social Issues (E.g., Insurance, Safety)	51	1	2	1.02	.140
Valid N (listwise)	51				

The table 10 provides insights into the perceived need for external support, the effectiveness of sustainable policies, and specific needs in the energy, environment, and social domains within the cement industry in Kashmir.

Starting with the belief in the need for external support, the mean score of 1.98 indicates that, on average, respondents agree that external support, such as government incentives, industry associations, and research institutions, is necessary to promote sustainability in the cement industry. This underscores a recognition within the industry that collaborative efforts and external assistance are crucial for advancing sustainable practices. Assessing the overall effectiveness of sustainable policies, the mean score of 1.90 suggests that, on average, respondents view these policies as moderately effective in promoting sustainability in the cement industry. While there is a positive perception, there is room for improvement, indicating that stakeholders may seek more impactful and comprehensive sustainable policies. Examining specific needs related to energy, environment, and social issues, the mean scores of 1.08, 1.04, and 1.02, respectively, indicate a low perceived need for additional support in these domains. This suggests that respondents feel relatively satisfied with the existing measures in place for energy-saving, clean production, and addressing social issues such as insurance and safety.

In summary, the analysis highlights a general agreement among respondents on the need for external support to promote sustainability in the cement industry. While there is a positive perception of the effectiveness of current sustainable policies, stakeholders express a desire for further improvements. The low perceived needs in energy, environment, and social issues indicate a sense of satisfaction with the current state of affairs in these specific domains. These findings can guide future initiatives and collaborations to enhance sustainability efforts in the Kashmir cement industry.

5.Conclusion:

The investigation began with gauging general awareness, revealing a notable lack of understanding regarding sustainability policies among cement industry stakeholders. However, respondents exhibited a partial awareness of environmental sustainability policies, indicating a baseline understanding. Economic sustainability policies, on the other hand, were better grasped, suggesting a degree of industry knowledge in this domain. Examining the accessibility of environmental, social, and economic sustainability policies exposed a moderate level of access, coupled with a hesitancy in full implementation. Stakeholders cited high initial costs as a primary obstacle, particularly for environmental policies. Notably, accessibility of social sustainability policies faced challenges attributed to a lack of comprehensive awareness among respondents. Insights into the impact of implemented policies revealed a dual nature. Positive impacts included increased worker efficiency and improved air quality in the surroundings. However, respondents also highlighted negative repercussions, primarily associated with escalated costs incurred during the adoption of new technologies. The study's final variable

explored the stakeholders' perceived need for government support. Results were unequivocal, with a substantial majority expressing the necessity for governmental assistance in implementing social, environmental, and economic sustainability policies

The findings collectively underscore the critical importance of bridging awareness gaps within the cement industry regarding sustainability policies, particularly in the environmental and social domains. While stakeholders acknowledge economic sustainability policies, addressing the challenge of high initial costs is imperative for comprehensive implementation. Positive impacts on efficiency and air quality highlight the tangible benefits of policy adoption, emphasizing the need for a balanced approach to mitigate associated costs. The clear consensus on the requirement for government support signals an opportunity for policymakers to play a pivotal role in fostering sustainability within the Kashmiri cement industry, supporting both awareness-building initiatives and alleviating financial barriers to policy implementation. This study provides valuable insights for stakeholders and policymakers alike, pointing towards collaborative efforts to enhance sustainability practices in the region's cement industry.

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