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Market Feasibility and Strategies for the Environment-Friendly Bricks in Bangladesh: A Learning from the Southern Part of Bangladesh

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ABSTRACT

This paper tried to assess the market feasibility and potential strategies for environmentally friendly bricks in southern Bangladesh. To assess the feasibility, the researcher used a mixed-methods approach. A total of 120 respondents were interviewed, including customers, entrepreneurs, wholesalers, masons, and laborers. The paper found that 85% of respondents were familiar with eco-friendly products, with 85% prioritizing them when buying. They prioritize product quality and price, with bricks being the most expensive. Most respondents believed eco-friendly construction materials were sustainable, cost-effective, and environmentally friendly. However, sales of burnt bricks decreased compared to the previous year, with 30% selling 40000 pieces of bricks last year. This paper also found a growing interest in using environmentally friendly building materials, with hollow blocks being more popular. Most enterprises invested on average 225,000 BDT, with an average monthly income of 17,800 BDT. Most respondents had eight male workers, with 80% not having female workers. Moreover, the study found some market management problems, including lower prices, low capital, and lack of digital marketing issues.

INTRODUCTION

The major problem that the world is facing today is environmental pollution. In the construction industry, mainly, producing ordinary Portland cement will cause the emission of pollutants, which results in environmental pollution. The emission of carbon dioxide during the production of ordinary Portland cement is tremendous because the production of one ton of Portland cement emits approximately one ton of CO₂ into the atmosphere. One of the biggest threats to the world is climate change, which is the result of greenhouse gas emissions into the atmosphere, primarily CO₂. The world's condition is rapidly deteriorating, and if people don't start taking eco-friendly actions, it will grow much worse. Buildings and other structures use up to 40% of all energy. The number could only be decreased by making the buildings eco-structures or by utilizing a greening concept. Eco-structuring, which benefits people, the community, the environment, and the builder, increases sustainability. A structure must be tailored to the local conditions, environment, culture, and community in order to consume fewer resources. Eco-friendly building materials help to enhance the environment by using 35% less energy, 35% less CO₂ emissions, 70% less waste output, and 40% less water. Because eco-structuring protects the environment, people, and economic development, it is the area of architecture that concerns architects today the most.

As the world's population continues to grow, so does the need for housing. According to ESCAP/RIPEM/CIB, 25% of the world's population has no fixed abode, while 50% of the urban population lives in slums. A quote from the UN Commission on Human Settlements

further buttresses this point: In the last few decades, shelter conditions have been worsening and housing demand has risen; therefore, the urgency to provide an immediate practical solution has become more acute. Given this perceived problem, many developing countries are formulating and implementing national shelter strategies based on the Global Strategy for Shelter. The central premise of the Global Strategy is the adoption of an enabling approach whereby the full potential and resources of the actors in the shelter production and improvement process are mobilized, but the final decision on how to house themselves is left to the people concerned. The strategy acknowledges building materials as one of the principal physical resources in the production and improvement of shelter. It also identifies several priority action areas to support local production and use of indigenous building materials; these include the promotion of technological innovations, the introduction of appropriate technologies, and local capacity building in small-scale enterprises. To this end, earth has been used as a cheap building material for thousands of years in all parts of the world. Its relatively new product is sand Crete blocks, but the high cost of sharp river sand and cement has made its use prohibitive. Bricks have not helped to provide a suitable alternative, as the increasing processing cost and the attendant high laying cost as compared to blocks have made brick a less viable alternative material. Recently, cement-stabilized laterite hollow blocks molded at a compactifying pressure of 13.76 N/mm² with 7% cement content have been found to have suitable strength and durability and are 40% cheaper than equivalent-quality sand-crate hollow blocks. There is therefore a need to explore further into this area of stabilization of

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local laterite since laterite possesses sufficient cohesion and, when improved by the addition of a suitable binder agent and given adequate compaction, gives rise to blocks cheaper than sandcrete blocks. Moreover, the purpose of this paper is to explore the nature of promoting eco-friendly building materials and educate people about them. Another purpose of this paper is to discuss how to increase product sales by promoting or marketing the use of environmentally friendly products.

Eco-friendly Construction Materials are Feasible

It is crucial to consider various aspects highlighted in the literature to evaluate the market feasibility of eco-friendly construction materials. Studies have demonstrated that the construction industry has been exploring the utilization of eco-friendly materials such as recycled aggregates from construction and demolition waste (Reis *et al.*, 2021). These materials have been successfully applied in projects involving concrete, mortar, eco-friendly concrete blocks, and geopolymer synthesis, showcasing their versatility and potential in sustainable construction practices. However, researchers have utilized the theory of planned behavior to predict the construction of eco-friendly houses, highlighting the importance of adopting eco-friendly architecture as a solution to environmental challenges (K & Sia, 2022). Government regulations and incentives in regions like Europe have bolstered the development of green composites and the integration of new eco-friendly materials, indicating a growing trend toward sustainability in construction (Vázquez-Neez *et al.*, 2021). Moreover, identified challenges in increasing the use of eco-friendly construction materials include the lack of centralized information on these materials, making it challenging for stakeholders to access comprehensive data on types, prices, standards, and environmental impacts (Wang *et al.*, 2019). Government policies, rather than market demands, have influenced the technology roadmap for eco-friendly building materials, highlighting the role of governmental initiatives in driving innovation in this sector (Shim *et al.*, 2019).

Research has also concentrated on developing decision support models for eco-friendly material selection, aiming to enhance decision-making processes for building owners and designers, particularly in regions like Vietnam (Pham *et al.*, 2020). Moreover, Moon *et al.* (2020) have emphasized the significance of government roles in promoting eco-friendly construction technologies and products, indicating a collaborative effort to encourage sustainable practices in the construction industry. Regulatory support, technological advancements, consumer attitudes, and government intervention precisely shape eco-friendly construction materials market feasibility. The construction industry can transition towards more sustainable practices by leveraging recycled aggregates, green composites, and innovative materials like geopolymers. Government initiatives, decision support models, and consumer behavior studies play crucial roles in shaping the market landscape for eco-friendly construction materials.

Strategies for Eco-friendly Construction Materials

Recent research findings suggest the implementation of various strategies to promote eco-friendly construction materials. Researchers have identified using recycled aggregates from construction and demolition waste as a technically feasible and environmentally friendly approach (Reis *et al.*, 2021). Additionally, incorporating eco-friendly materials like geopolymers, which repurpose waste into construction materials, can significantly contribute to sustainable construction practices (Frangieh *et al.*, 2022). Furthermore, the use of plastic waste in fiber-reinforced concrete has shown promise in creating eco-friendly concrete for construction applications (Suksiripattanapong *et al.*, 2022). In terms of decision-making processes, studies have highlighted the importance of personal norms and attitudes in driving eco-friendly choices (Han, 2014; Sia & Jose, 2019). Researchers have applied the Theory of Planned Behavior to predict the construction of eco-friendly houses, highlighting the influence of personal norms on behavior (K & Sia, 2022). Moreover, the development of decision support models for eco-friendly material selection can aid in choosing the best construction strategies (Pham *et al.*, 2020).

Factors such as sustainability, carbon reduction, and waste management must be considered to increase the adoption of eco-friendly construction materials. Sustainable road pavements using eco-friendly cementitious materials have shown promise in reducing carbon emissions during construction (Amakye *et al.*, 2022). Additionally, the development of green composites and the integration of new regulations to facilitate the use of eco-friendly materials can further promote sustainability in construction practices (Vázquez-Núñez *et al.*, 2021). Shortly, by leveraging recycled aggregates, eco-friendly materials like geopolymer, and sustainable practices in material selection, the construction industry can make significant strides towards eco-friendly construction. Incorporating personal norms, attitudes, and decision support models can further enhance the adoption of sustainable construction materials, contributing to a greener and more environmentally conscious construction sector.

Bangladesh Context

To evaluate the market feasibility and strategies for introducing environmentally friendly bricks in Bangladesh, it is crucial to consider various aspects such as consumer behavior, market orientation, and policy frameworks. Bangladesh boasts a significant brick production industry, with over 7,000 brick kilns producing nearly 23 billion bricks annually (Peris *et al.*, 2020). Understanding consumer behavior towards eco-friendly products, as highlighted in studies on environmentally concerned consumer behavior in different regions, can guide marketing strategies for promoting environmentally friendly bricks (Kautish & Dash, 2017). Moreover, the presence of the Green Banking Policy in Bangladesh emphasizes the importance of sustainable financial practices, which can support businesses in adopting eco-friendly approaches

(Iqbal *et al.*, 2021). In terms of market segmentation and consumer perception, studies like “Green Segmentation: An Application to the Portuguese Consumer Market” shed light on consumer awareness of environmental issues and the translation of concerns into behavior (Paço & Raposo, 2009). Additionally, research on factors influencing the buying intention of organic products in Bangladesh emphasizes the significance of consumer trust in influencing purchase decisions (Sumi & Kabir, 2018). This underscores the importance of building trust and credibility when introducing environmentally friendly bricks to the market.

From a product development perspective, exploring sustainable building materials like compressed stabilized earth blocks (CSEBs) can offer viable alternatives for eco-friendly construction practices (Sapna, 2023). Furthermore, utilizing industrial waste materials for non-fired brick production, as discussed in studies on non-fired building blocks using industrial wastes, can contribute to a cleaner environment and a sustainable society (Islam *et al.*, 2022). Policy initiatives such as green banking and local strategies for climate resilience, as highlighted in “Green Banking for Environmental Management: A Paradigm Shift” and “Local Strategies to Build Climate Resilient Communities in Bangladesh,” respectively, provide a supportive environment for promoting eco-friendly initiatives (Tara *et al.*, 2015; Amir, 2021). These policies can complement market strategies and consumer preferences, creating a conducive ecosystem for the adoption of environmentally friendly bricks in Bangladesh. A comprehensive approach that considers consumer behavior, market orientation, policy frameworks, and sustainable product development is crucial for successfully introducing environmentally friendly bricks in Bangladesh. By aligning market strategies with environmental goals and leveraging existing policies and consumer trends, businesses can capitalize on the growing demand for sustainable construction materials in the country.

MATERIALS AND METHODS

This article tried to assess the market feasibility and potential strategies for environmentally friendly bricks in the southern part of Bangladesh. However, the market survey team developed an appropriate methodology (most preferably, a mixed-method approach) to meet the objectives of the assignment. The methodology included a statistically reliable and acceptable sampling method and estimation, an appropriate study method, and so on. The methodology and relevant instruments and tools were adjusted and finalized in consultation with the research team. However, the researchers used innovative ideas where needed in the scope of the assignment. The following methodology and research tools were applied, but were not limited to, during the study: a) A survey of the targeted respondents; b) Interviews with key stakeholders; c) FGD with the customers, entrepreneurs, whole-sellers, masons, and labor. A total of 120 respondents

(customers, entrepreneurs, whole sellers, masons, and labors) were interviewed with an interview schedule. A total of four key informants were interviewed to fulfil the research objectives. Moreover, two FGD sessions with the respondents were conducted in the research area. It is worth mentioning that to analyses the quantitative data, the researcher used SPSS version 22 software.

RESULTS AND DISCUSSION

Scenario of Bricks Production

Burnt bricks are mainly produced throughout the country, as they have done in Bagerhat, and most of the time, the producers and the associates do not properly maintain the rules and regulations while producing and marketing. One of the key informants, Md. Kamarujjaman Sarkar, Deputy Director, DOE, Bagerhat, stated, “The Bangladesh government has some rules and regulations regarding brick production. But not a single brick production company maintains those policies over Bangladesh and here as well.” Md. Sarkar also quoted some of the rules and regulations, e.g., no individual can cut earth from ponds, canals, marshes, creeks, lakes, rivers, wetlands, sandbars, or other areas without permission from appropriate authorities; wood cannot be used to fuel brick kilns; coal containing excess amounts of Sulphur, ash, mercury, or other such materials cannot be used for brick burning fuel; and bricks and brick-making materials cannot be transported to and from the brickfield by road without the permission of a local government engineering department, Upazila authorities, union authorities, or village authorities. However, almost all the key informants claimed that “the owners of brick production factories do not maintain the rules and regulations properly, which are needed to be maintained.” along with Executive Engineer, PWD, Bagerhat, claimed, “Those who produce bricks do not give enough importance to the environment while producing bricks. They do whatever they need to do to conduct their business.” Besides this, there is no authority to look into the mismanagement of this sector. According to another key informant Chairman of Bagerhat Sadar, “No government office or offices are made responsible for following up on this sight. Actually, this sector remains unsupervised by the government.”

Bricks Production and Environmental Pollution

Brick kilns are recognized as one of the largest stationary sources of black carbon, which, along with iron and steel production, contributes to 20% of total black carbon emissions. “Definitely, the conventional brick production system causes harm to the environment. The vast majority of kilns use outdated, energy-intensive technologies that are highly polluting. This leads to harmful impacts on health, agricultural yields, and global warming,” stated Nirmol Kumar Kundu, Upazila Engineer, LGD, Bagerhat Sadar. Bricks are made for construction. But the country’s brick kilns are churning out the basic ingredients for construction in a way that is doing more harm than good. Md.Abu Jafar Siddik, Executive Engineer, PWD,

Bagerhat, claimed, “The bricks field owners have been burning bricks with firewood. As a result, many trees like keora, ‘chaila’, sundari, mehghini, bain, etc. are being felled indiscriminately. The dishonest brick field owners collect the firewood from different forests with the help of their agents, which is destroying the ecosystem.” Another informant, Md.Mohitur Rahman, Chairmen, Bagerhat Sadar, stated, “As a huge amount of soil is used for brick production and topsoil is being cut, it spoils the productivity of the soil for agricultural use in extreme cases.” All the key informants claimed that “brick kilns cause serious environmental pollution like air pollution, soil pollution, deforestation, etc.”

Opinions about Environmentally Friendly Building Materials

Bangladesh now makes environment-friendly materials for building multi-stored structures. Eco-friendly building materials are built with consideration for the natural environment. They are designed and constructed to conserve natural resources, produce less waste and emissions, and utilize sustainable materials that have been ethically sourced. Md. Kamarujjaman Sarkar, Deputy Director, DOE, Bagerhat, stated, “To reduce the intensity of harm to the environment by these factories, eco-friendly construction materials can be an alternative to this.” Eco-friendly, all-natural products ensure safety from all dangerous chemicals and allow families to avoid risky additives that can cause harm. Using eco-friendly products improves quality of life regarding mortality, age, diseases, and illnesses. They ensure the safety of families and the planet as well. Md.Abu Jafar Siddik, Executive Engineer, PWD, Bagerhat, stated, “Eco-friendly products promote green living that helps to conserve energy and also prevent air, water, and noise pollution.” However, more or less all the key informants claimed that “eco-friendly construction materials can be an alternative to conventional bricks, which will not pollute the environment to that extent. They also claimed these materials were largely earthquake-resistant, which will help reduce environmental pollution as well as cut construction costs.”

Possibility of Creating a market for Eco Bricks

All the key informants opined that there is a huge opportunity to create a market for eco-friendly construction materials. The government of Bangladesh has announced the use of 100% eco-friendly building materials in every government project by 2025. However, the informants mentioned some of the ways to create a market for eco-friendly construction materials.

- If quality can be ensured, a market for eco-bricks or hollow blocks, like conventional bricks, will be automatically created.
- To create a market, the general public should be informed about these materials, made aware of the environment, and convinced of the importance of these eco-friendly construction materials.

- If every government project makes it mandatory to use eco-friendly construction materials, it will be easy to reach the market.

- If the price of these items is made comparatively reasonable compared to normal bricks, it will help create a market, and definitely a vast promotion is required.

- Bangladeshi and multinational companies are needed to produce environment-friendly building materials.

More or less all the informants opined that they were interested in using eco-friendly construction materials, but the quality and price of the materials were the most influential factors in their use, according to them. All of them made similar statements. “If these eco-friendly construction materials are quality products, then we will prioritize them. As the government has already made a policy to use 30% EFCM in government projects, we definitely have to use it.” Moreover, the research team is talking with the customers who already use hollow or solid blocks. Talking to them, the research team also got to know that customer satisfaction is good; they also said that people don’t want to buy because it is a new product and there is no competitive market. Along with this, the research team also interviewed brunt brick labor and EFCM manufacturing labor. The main benefits of manufacturing hollow blocks are labor safety and better mental health. The brunt of brick labor is facing many health problems. They said then they worked in the brunt brick, and black smoke entered their noses and mouths. Also, many problems arise in their bodies due to the heat of the brick kiln. Meanwhile, the laborers who manufacture EFCM products do not face this kind of problem. They are making the bricks in the machine.

Cost analysis between Two Types of Bricks For Hollow Block (1 Month)

| Cost Indicators | Total (Bangladeshi Currency) |
|--|------------------------------|
| Labor Cost (1 month) | 15000 |
| Electricity (1 month) | 1000 |
| Rent (1 month) | 2000 |
| Guard (1 month) | 3000 |
| Raw materials (total 1-month production raw materials) | |
| Fine Sand (246 bale) | 7380 |
| Coarse sand (246 bale) | 7380 |
| Dust (246 bale) | 6150 |
| Nuri stone (246 bale) | 12300 |
| Cement (246 bale) | 131760 |
| Total Cost | 185970 |

With this material, the total Hollow block production is 5400 pcs

Cost of production 1 piece = 185970 / 5400

=35 taka per piece production.

Selling price of 1 piece = 50 taka

Total selling price = 5400*50
 =270,000
 Benefits =270,000 – 185970
 =84030
 Per piece benefits =15.56 taka
 For Solid block (1 Month)
 Total Solid block production is 22140 pcs with the same materials.
 Cost of production 1 piece = 185970 /22140

= 9 taka per piece production.
 Selling price of 1 piece = 12 taka
 Total selling price = 22140*12
 =265,680
 Benefits =265,680 – 185970
 =79,710 taka
 Per piece benefits =3.60 taka
 Benefit difference is 15.56-3.60 =11.96 taka
 We all want the structures we construct to be long-lasting.

Table 1: Comparison Between Burn Brick and Eco-block

| Indicator | Brunt Brick | Eco-Bricks |
|---------------------|---|---|
| Strength | Brunt bricks have a less compressive strength (1500 PSI). | Eco-block has a higher compressive strength (2400 PSI). |
| Price | Price of brunt brick is High (15\16). | Price of Eco bricks is less. Hollow block is (50) and solid block (12). |
| Stability | Brunt bricks are not stable, workable, and long-lasting. | Eco-bricks are more stable, workable, and long-lasting. |
| Waterproof capacity | Eco-Bricks have better waterproofing capacities. | Eco-Bricks have better waterproofing capacities. |
| Temperature | Less temperature holding capacity. | High temperature holding capacity. |
| Environment | Brunt bricks is harmful for environment. | Eco-Bricks is environment friendly. |

Source: HBRI report 2022

Individuals always desire to make material selections that are both extremely strong and most suited to their budget. Concrete and traditional red bricks are two materials that can be used as building blocks because of their strength and durability. Red bricks and concrete blocks differ greatly from one another since they are made of totally different materials. Based on the characteristics of building block materials, the next section will describe the main distinctions between concrete blocks and red bricks.

Strength in Tension and Compression

An essential physical quality of materials used as building blocks is compressive strength. Compared to red bricks, concrete blocks have a higher compressive strength. This is so that concrete blocks can withstand greater compressive pressure during manufacturing.

Construction Cost

The cost of construction is at the top of the priority list of all property owners. People want to build the most durable structure at the lowest price possible. To build a house with hollow block construction, the cost is reduced a lot. The size of hollow block is 400mm*200mm*115m, and brunt brick is 9.9 inches * 4.4 inches * 2.75 inches. So, the construction cost is automatically lower because one hollow block is equal to five bricks.

Stability

Red bricks are substantially heavier than concrete blocks. Hollow concrete blocks are more stable, workable, and long-lasting when compared to solid concrete blocks

because of their lesser weight. Moreover, hollow concrete blocks allow for layouts that are more earthquake-resistant than red bricks. In earthquake-prone areas, concrete blocks with higher compressive and tensile strengths are more stable.

Waterproof Capacities

Another critical difference between concrete blocks and red brick is their waterproofing capabilities. Builders prefer using concrete blocks in high-moisture and muddy locations because concrete blocks can repel water much better than traditional red bricks. If red bricks are exposed to damp weather, they can get damaged easily, and mold can form, compromising their quality.

Temperature Insulation

Between red bricks and concrete blocks, thermal conductivity is a clear distinction. In hollow blocks, there is some whole so that in hot temperatures, the block does not heat up, so the room stays cool.

Environmental Impact

Concrete blocks are manufactured using fly ash instead of stone aggregates. Fly ash is a by-product of thermal plants. Instead of dumping fly ash into the earth, which can make the soil toxic, researchers have figured out how to use fly ash to make concrete blocks. It reduces costs and strengthens the concrete blocks internally. With the advancement of technology, concrete blocks are now being produced with incredibly accurate machines that spit out identical-dimensional concrete blocks. So,

concrete blocks will always be cheaper than traditional red bricks. Red bricks are considered harmful to the environment as they have a higher carbon footprint than concrete blocks. The manufacturing process involves the excavation of topsoil on Earth that can deplete minerals from nature. Furthermore, it creates a harmful impact on the environment while being manufactured at plants.

Market Demand for Hollow Block and Solid Blocks

From the market research and field observation data, we found that most people have knowledge about hollow blocks (48.6%) and solid blocks (20.5%). The research team found that 97.5 percent didn't use eco-friendly construction materials before, while only 2.5% do. Talking with the small and big entrepreneurs research team, we heard that when they start doing this business, their sales are not so high. They are trying very hard to sell their eco-bricks, but people are not showing any kind of interest, but now a day's people are more aware than before. People come to visit their industry, and they show interest in buying eco-bricks in the future. Some of the people have already started buying hollow or solid blocks for building their washrooms or cow shelters. They said that it is difficult to change people's attitude towards burnt bricks, but slowly people understand, and market demand is increasing. Taking it from the entrepreneurs, we know that people are showing interest in buying hollow and solid blocks, and they gave us some reasons for the increase in market demand for hollow and solid blocks. The size of the hollow block is very large. Five bricks of burnt bricks equal one hollow block. The size of the hollow block is 400mm * 200mm * 115mm, and the solid block is 240mm * 115mm * 76mm. So, the bricks are bigger than burnt bricks. So, building a house with hollow or solid blocks is much cheaper than using bricks. The price of burnt brick is 15 or 16 taka per piece, but the price of solid and hollow blocks is between 50 and 12 takas. So, people who want to make a house at a cheap rate first consider hollow blocks and think about buying hollow blocks. Another major idea is to build demand for the block based on their load capacity. The load capacity of hollow blocks is 2400, and that of solid blocks is 1100. Another major substance for building demand for hollow block and solid block is time-consuming. If a man can build a house with bricks within 3 months, then he can build a house with hollow or solid blocks in 2 months. For saving time and money, people prefer hollow blocks to solid blocks, and that's why market demand has increased. The study discovered that the majority of the respondents, 97.5%, opined that they will use environmentally friendly building materials, while only 2.5% of respondents stated negatively that they believe these eco-friendly building materials are not sustainable. According to the findings of the study, 99.2% of the respondents would recommend their family and friends use these eco-friendly construction materials, while only 0.8% of the respondents stated negatively. So, it can be said that the demand in the market is increasing

rapidly, and people are now starting to show interest in buying hollow block and solid block.

Marketing Strategy of Eco-friendly Construction Materials

For improving sales and markets, a value marketing strategy is very important for any product. It makes the customers aware of your products or services, engages them, and helps them make a buying decision. Marketing can help businesses increase brand awareness, engagement, and sales with promotional campaigns. No matter what area a business focuses on, they can take advantage of all the benefits marketing can offer and expand their reach. Marketing is a valuable tool for growing businesses, but to stay competitive and maximize return on investment (ROI), it's important to approach marketing as a process and to use all the benefits it can provide.

Poster and Banner Distribution among People

After collecting the information, NGOs already know about people's knowledge about EFCM products. In which areas people are not getting enough knowledge, NGOs need to promote themselves the most. After conducting the market survey, NGOs already know what the actual condition of the market is and how much people know about this product. Now in those areas, NGOs need to emphasize promotional activities, and NGOs will distribute leaflets, posters, and banners in those places.

Communication with Developer Company and Contractor

Those who work with constructors must communicate regularly to convince them to tell their clients about eco-friendly concrete materials. Clients should not use normal bricks. Some gift or percentage on sale can be arranged for them so that they can increase the sales and use of these products and create a positive view about EFCM products.

Linkage with External Stakeholders

NGOs have already started communicating with external stakeholders. NGOs have already communicated with PWD engineers and upazila engineers of LGD, and they assured us that if the quality of the blocks is good, they will use the EFCM products and hollow blocks in government projects. NGOs will interact with them more according to our marketing plan.

Product Certification and Standardization

Whereas the stakeholders said they are willingly interested in using the EFCM product for the government project, NGOs need to communicate with the stakeholders and convince them to maintain the quality of the product. So that they can sell the EFCM products in government-related projects.

Facebook Promotion and YouTube Promotion: NGOs have already started posting Facebook and YouTube content video clips and uploading them to the channels. NGOs are making videos of entrepreneurs and their products and uploading them to the channels. NGOs are uploading new videos and content at regular intervals so that people's interest builds and sales may increase.

Branding

NGOs have already created many slogans for branding and used those slogans in the posters. We are now trying to build a unique logo for the EFCM product. It will help to understand why this product is unique from other products and make people interested in buying these products.

Workshops

NGOs are trying to organize a workshop or event very soon where all kinds of stakeholders and all types of people, including owners of small and big entrepreneurs, will be present. By doing this, people will see the product and know about its use and benefits, which will help our marketing strategies.

Use of Environment-friendly Blocks in the Future

The study discovered that the majority of the respondents, 97.5%, opined that they will use environmentally friendly building materials, while only 2.5% of respondents stated negatively that they believe these eco-friendly building materials are not sustainable.

Graph 1: Use EFCM in future

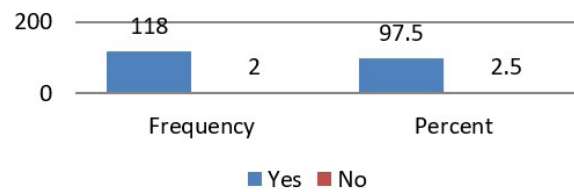


Figure 1: Use EFCM in future

Recommend this Product to Friends or Family

According to the study's findings, 99.2% of the respondents would recommend that their family and friends use these eco-friendly construction materials, while only 0.8% of the respondents stated negatively. Hence, almost all customers would suggest to their family and friends that they use eco-friendly building materials.

Graph 2: Recommend this product to friends or family

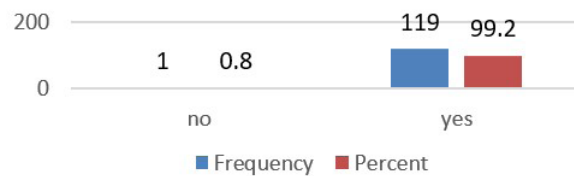


Figure 2: Recommend this product to friends or family

Graph 3: EFCM Scaling

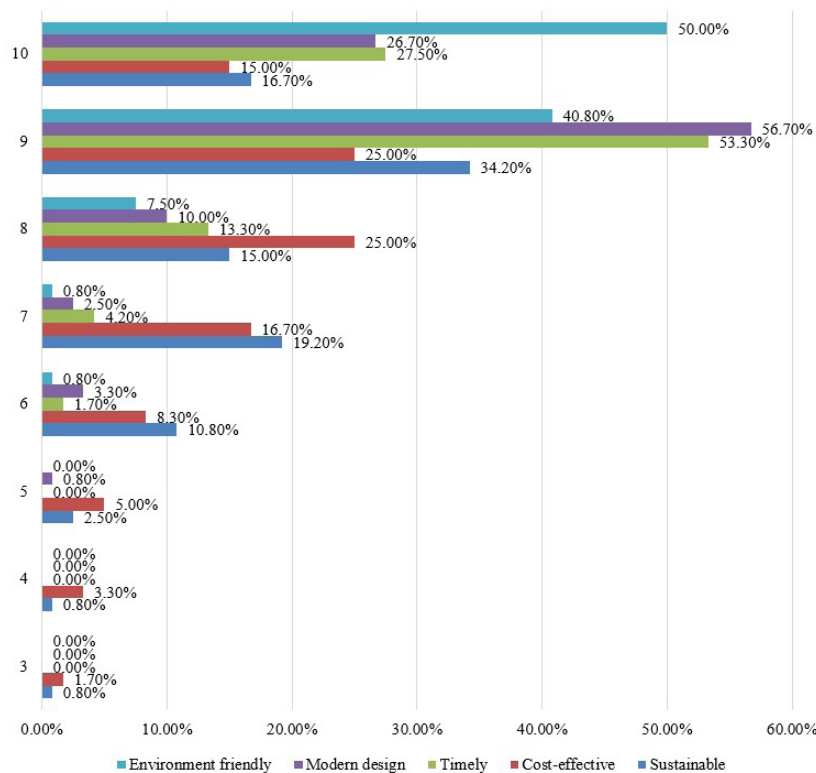


Figure 3: EFCM Scaling

The graph 3 provides some indicators regarding eco-friendly construction materials, including sustainability, cost-effectiveness, modern design, and environmental friendliness. However, the study revealed that half of the respondents firmly believe that eco-friendly construction materials are environmentally friendly, while 40% scaled it 9 out of 10. The majority of the respondents believe

that EFCMs are sustainable on a different scale, while 16.7% firmly believe that EFCMs are sustainable. The study also revealed that in the case of modern design, more than half of the respondents' EFCM was 9 out of 10, suggesting that 56.7% of the respondents find it to be modern design. However, a large number of the respondents believe EFCM is cost-effective.

Graph 4: What steps can be taken to create awareness among people to use eco-friendly products

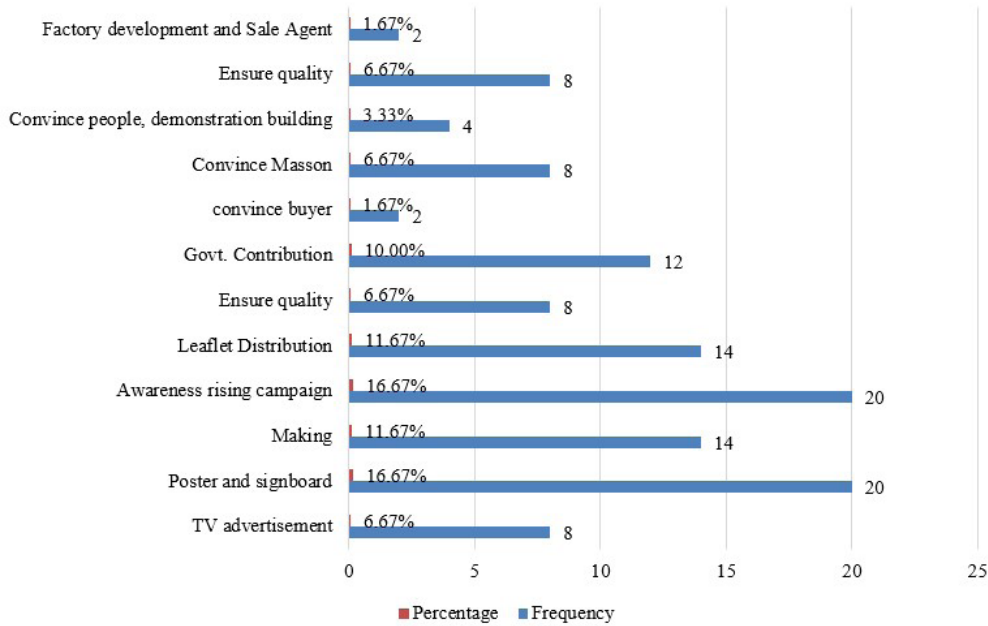


Figure 4: Steps are needed to create awareness about EFCM

The graph 4 provides some suggestions for promoting eco-friendly construction materials among customers. However, the study revealed that the majority of the respondents (16%) suggested raising public awareness through an awareness-raising campaign, and a similar portion (16%) opined promoting through posters and signboards, while a similar number of the respondents (11.2%) suggested making and leaflet distribution, respectively. However, the rest of the respondents suggested ensuring quality, convincing buyers, Masson, government intervention promotion cases, etc., for creating a better market for eco-friendly construction materials.

CONCLUSION

Bangladesh faces significant difficulties in controlling urbanization, growth, and development. It is essential to construct new environmentally friendly projects and restore current environmentally friendly structures, which will also lower prices in order to battle climate change, lower energy costs, and lessen our reliance on fossil fuels. We must abide by the eco-structure for our well-being in light of an increasing population. Public-private partnerships can be used to achieve the objectives of eco-structure construction. If we accept the future and

the changes it will bring, we can strike a balance between our lives and the environment, ourselves, and our way of living. Although Bangladesh will demographically become an urbanized nation in less than four decades, the shape of urbanization in the future is still unclear. One tends to feel anxious when one considers political and cultural linkages, the threat of climate change, and the crisis of governance at the national and urban local levels. We hope that within a few decades, despite the serious urbanization issue we are currently confronting, we will raise our children in an eco-friendly metropolis.

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