Research Note
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Bricks to Blocks: An Exploratory Study of Policy and Practices in the Construction Sector of Bangladesh

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In a move to promote more sustainable technologies in the construction sector, in 2019 the Government of Bangladesh introduced a shift from fired clay bricks to blocks in public construction. This policy was motivated by the low carbon emissions in making blocks, and to reduce the soil degradation and air pollution caused by bricks production. However, the policy has gained little traction and the implementation has been slow. A central information system to monitor the progress is yet to be operational. While the COVID-19 pandemic is partly responsible, there are major concerns among government officials as well as private sector contractors regarding the quality and costs of blocks. These perceptions are in sharp contrast to what we found in the literature and to what the technical experts involved in civil construction and housing research have to say. This bias is potentially reflective of people's lack of experience with the materials. This exploratory research demonstrated a possible status quo bias whereby people are more fearful of the unknown, especially for any construction work that is expected to last for decades. We identified a few intervention and research opportunities to explore for improving the policy implementation as well as speeding the uptake of this technology.

Introduction

The Government of Bangladesh adopted a policy in 2019 to shift the use of fired clay bricks to blocks to promote sustainable technologies in the construction sector, due to higher carbon emissions, degradation of fertile topsoil, and air pollution involved in brick production. The policy intends to reduce the environmental impacts of public construction projects, and thus influence a shift in the private sector by setting new norms in construction works. Since such a shift requires coordination between the bureaucracy (who are expected to implement the policy) and the private sector, as well as coordination among different groups within the construction sector (such as brick/blocks makers, engineers, contractors of public projects, etc.), this exploratory study was initiated to assess the implementation status of the policy and potential bottlenecks. The research adopted a mixed method approach where primary data was collected using key informant interviews (KIIs) and a cross-sectional survey of contractors. Secondary information from tender notices was collected for descriptive analysis.

Context

Fired clay bricks (FCB) are the main building material used in Bangladesh. They are made by using Fixed Chimney Bull Trench Kiln (FCBTK) and constitute over 90% of the bricks used in the country (Islam, 2016). Besides the high carbon emission from the FCBTK, this practice contributes to 17% of the total loss in agricultural topsoil every year (Huq and Shoaib, 2013) – with related soil degradation causing 40-80% of crop productivity loss (Biswas et al, 2018), and causes severe air pollution resulting in a hazardous level of air

quality (Sadeq, 2019). While Hybrid Hoffman Kiln (HHK) has been suggested as a relatively cleaner technology compared to FCBTK for making FCB or 'bricks', hollow cement blocks (HCB) and interlocked soil stabilized blocks (ISSB) or 'blocks' are far better alternatives to FCB in terms of carbon emissions, ambient air pollution, and soil degradation.

The Government of Bangladesh (GoB) has adopted several policies to encourage the sustainable development of the country and to deal with the challenges posed by climate change. One such policy is to shift from bricks to blocks in all public constructions by 2024-25. Considering the environmental effects of FCB, the Ministry of Environment issued a gazette on November 24, 2019 setting targets for the use of blocks in the construction and repair of government buildings, boundary walls, herringbone roads, and village roads. The targets are 10%, 20%, 30%, 60%, 80%, and 100% of all the relevant contracts from 2019-20 to 2024-25 fiscal years respectively. Subsequently, the Public Works Department (PWD), under the Ministry of Housing and Public Works, was assigned the implementation of the policy in coordination with all other ministries. Since construction projects by the GoB account for more than 30% of the total construction in the country, the policy also aims to encourage the shift from bricks to blocks in private construction works by setting new norms.

Methodology

The research adopted a mixed method approach where primary data was collected using key informant interviews (KIIs) and a cross-sectional survey of contractors. Secondary information from tender notices was collected for descriptive analysis. Besides national-level key informants, survey data were collected from 16 districts and district-level KIIs were conducted in four districts. For KIIs, we interviewed engineers and other officials from relevant government authorities. The aim was to understand i) the processes of policy implementation that require coordination among different ministries in general as well as specific to the 2019 policy; ii) their views on how different procurement-related policy decisions that are taken through periodic gazettes get implemented by the tender evaluation committees; iii) the challenges in the implementation of the 2019 policy decisions.

The primary survey targeted contractors with experience in construction work, in order to generate descriptive statistics on their awareness about the policy to use blocks in public construction, their opinion on the cost and quality of blocks vs. bricks, and perceived barriers to greater adoption of this technology. This sample was drawn from the list of private contractors who had submitted bids for any construction contract tendered by the government in the last two years at the district-level procurements. 418 of the 480 respondents reported having won and implemented some government construction/civil engineering work. While this may not be reflective of all the firms who are involved in the construction sector, the selection of firms who work in public construction work gives us a picture of the situation who is most relevant to our investigation.

Findings

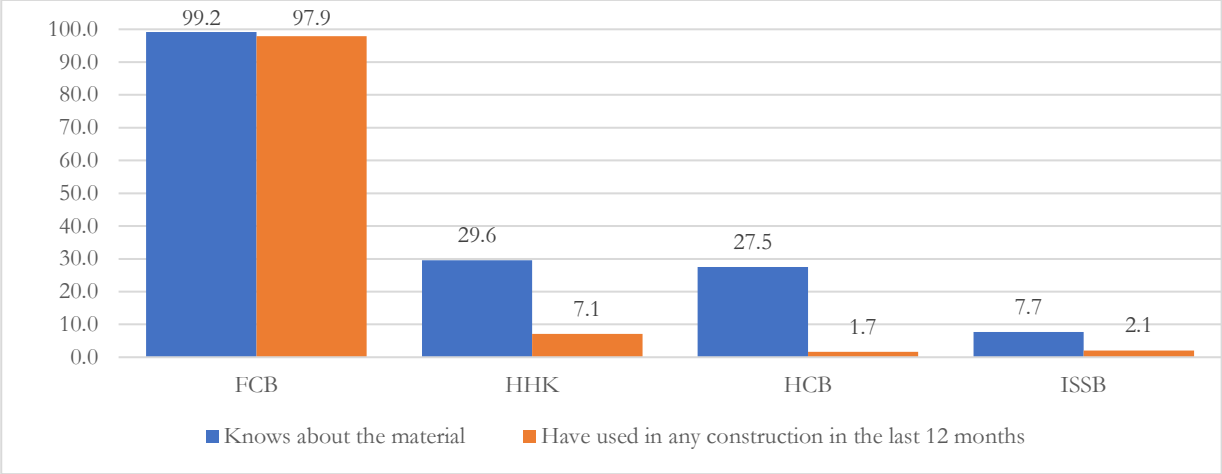
Our findings indicate that the progress has been "slower" than that set by the targets. Although each ministry is supposed to provide updates to the Ministry of Environment every four months about the progress, based on our KIIs with relevant stakeholders the tracking has not been fully operationalised. The qualitative interviews also revealed that there is no established data collection method or monitoring system to track the progress of the policy targets. Though progress was slow due to COVID-19 as well as the price hike (which

were mentioned as results of supply chain disruption, the war in Ukraine, and foreign currency reserve), no systematic data has been collected.

Knowledge of bricks vs blocks

Our findings show that while all those who were surveyed are aware of bricks, only 27% know about HCB (blocks) and 8% know about ISSB (blocks), despite the strong potential of ISSB as a building material (see Fig 1).

Fig 1. Perception and experience of bricks and blocks



The survey revealed that only 25% of respondents know about the 2019 policy and that the likelihood of bidding by private or nongovernmental organizations (NGO) tender is almost twice as large for those who are aware of the policy compared to those who are not. This potentially indicates a status quo bias or tendency to not explore changes among contractors primarily reliant on doing construction work for the government. Most of the respondents (79.80%) said that the main advantage of FCB is that they are easily available, followed by their cost advantage (55.17%). For HCB and ISSB, a majority of respondents reported not knowing about any advantage (55% and 76% respectively), and less than 10% reported lower pollution as an advantage.

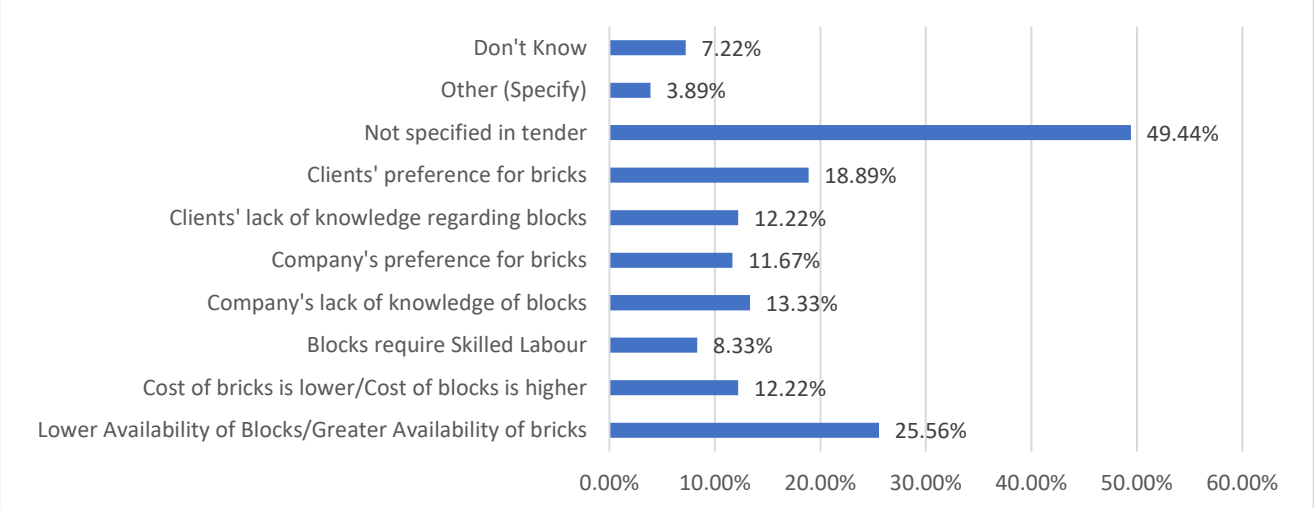
Our qualitative findings show that though the unit price is higher for the blocks, the net cost is lower as blocks being lighted require a smaller foundation size, a lower amount of rods and cement, and reduced column size—which creates more space. However, lack of availability may drive up costs as transport costs will rise. Other disadvantages stated for hollow blocks include weaker bonding as there is less surface available for mortar. Moreover, cracks can develop in the wall if users try to nail into the wall or are not familiar with the process of doing electrical wiring when the walls are made of blocks. If the curing is not done properly, rainwater can get through the blocks, weakening the walls. There can be damage to blocks during transportation although this can be mitigated by constructing blocks on-site.

Use of bricks vs blocks

Our survey shows that the use of blocks is extremely low amongst the surveyed contractors. Only 2% of the respondents reported using either HCB or ISSB in any work in the last 12 months. When cross-referenced with the respondents having higher education (at least graduation), usage of improved bricks or blocks is

slightly higher than those whose education level is lower. For example, 2.7% of the contractors with graduate (or above) degrees reported using HCB in the past 12 months compared to 0.8% of the rest. Since only a few respondents reported using HCB or ISSB (8 and 10 respondents respectively), we asked them about the reasons for not using blocks despite being aware of the policy. According to them, the reasons behind not using blocks in the tender are: “they are not specified in tender” (49.44%) and “limited availability” (25.56%) (see Fig. 2).

Fig 2. Reasons for not using HCB or ISSB



When asked about the main barriers to greater adoption of HCB or ISSB in public construction, most of the respondents (45.81%) said that availability is the main barrier followed by bidders’ lack of knowledge of blocks (19.70%) and cost (18.24%). Similar findings from the qualitative data show that blocks are not easily available and users lack knowledge about blocks.

Policy Implications

Recommendations from our qualitative research include operationalising the monitoring system of policy progress as well as the supply-side incentives, such as easing the import of stone and financing incentives. Regular reporting of the policy progress through progress reports generated by the concerned departments is to be tracked by the Department of Environment (DOE). In addition, the government should incentivise more factories to make blocks and therefore increase availability, which will reduce the transportation costs. One of the respondents highlighted the role of financing incentives through banks. Under the Bangladesh Bank Refinance Scheme for Green Products/initiatives/projects, loans are available at 7-8% interest for making compressed blocks but the respondent noted that scheduled banks are not giving these loans due to risk aversion. As technical knowledge was found to be low amongst surveyed contractors, knowledge training would be a useful next step, especially for government contractors who seem to be less aware of the policy relative to NGO or private contractors, despite the policy targeting public construction.

Next steps

This exploratory research investigated the status of the implementation of a policy adopted by the Government for addressing multiple challenges posed by the excessive use of fired bricks. Despite the policy having great potential, its implementation has been extremely slow. There are three "innovations” that can be tested in the short run to make some progress on this front. First, to consider specifying the use of blocks

in tender documents. Second, to create greater visibility of the policy to the procurement officials and contractors. Third, to use demonstration visits to eliminate biases/misperceptions about the durability of blocks and their cost. In the long run, vocational institutes need to adapt their civil engineering and brick laying courses to train a workforce skilled in using blocks.

References

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