

Policy Brief 38

Mitigating the Impact of Climate Change On Egyptian Cities: Sustainable Building and Construction as a Strategy

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I. Problem Context and Analysis

Cities across the world expend around two-thirds of the world's energy and contribute to the production of more than 70% of global carbon dioxide emissions (World Bank Group, 2021). However, the significance of cities lies in offering social and economic advancements to communities (Glaeser, 2011; Habitat for Humanity International, 2021). Globally, the construction and building sector solely contributes to around 40% of energy-related emissions since 2021 (United Nations Environment Program, 2021). In the case of Egypt, the construction and building industry is one of the top socio-economic sectors that contributes 7.5% to Egypt's Gross Domestic Product (GDP) and 13.6% to employment, yet the sector consumes 28% of the total energy produced in Egypt (Navigant Energy Germany GmbH, 2022; Central Bank of Egypt, 2022).

Despite the positive contributions of the construction sector to the Egyptian economy, sustainable approaches have been neglected by the industry to reduce its adverse impacts on the environment. Egypt faces a wide range of challenges varying from the high increase in population to 140 million people by 2050 to the issue of solid waste and encroachment on agricultural lands and the current negative impacts of the natural and built environments (Egypt's Vision 2030). Hence, the policy problem within the construction sector in Egypt is the lack of consensus on an approach to sustainable construction in practice. For the scope of this paper, the construction process is tackled from the angle of sustainable construction and green buildings in Egypt. The problem tree analysis shown below in Figure 1 lists the causes and effects of failure to adopt sustainable construction methods in Egypt.

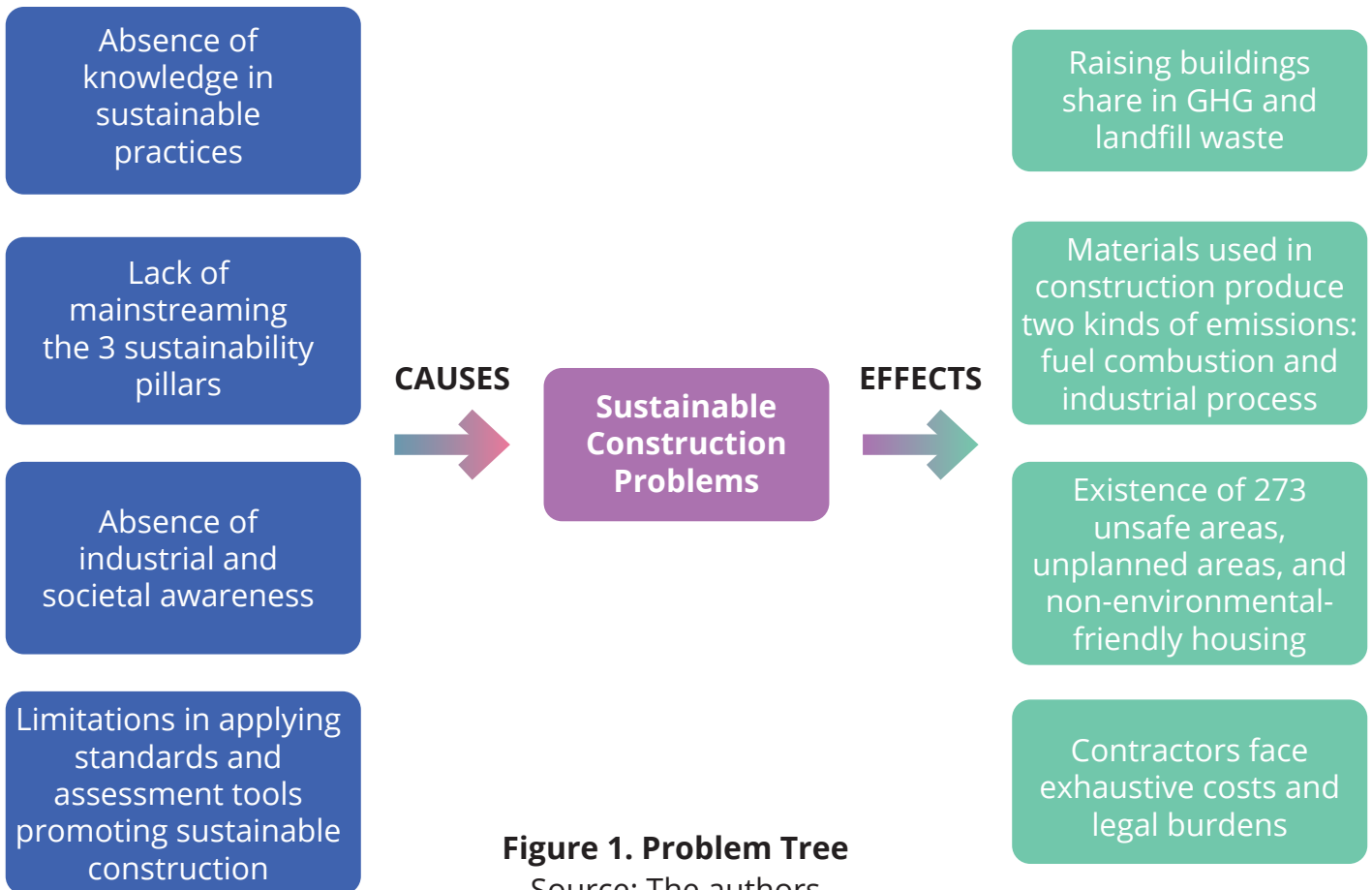


Figure 1. Problem Tree

Source: The authors

The Legislative and Regulatory Framework in the Construction and Building Sector

Egypt's Unified Building Law No. 119 of 2008

Egypt's Unified Building Law No. 119 of 2008 focuses on the gaps in Law No. 106 of 1976 by limiting the period of issuing building permits by the governmental authorities not to exceed thirty days and restricting the reconciliation with the individuals who breach the law. However, it has its own gaps, such as disregarding the differences between regions in terms of geographical location, weather, type of activities, and people's cultures and backgrounds, a lack of consensus on sustainable building understanding, and an absence of effective monitoring and evaluation.

Egypt's Rating Systems

The Leadership in Energy and Environmental Design (LEED) rating system cannot be implemented on a wide range in Egypt due to the significant cultural and environmental changes between Egypt and the United States. Thus, in 2011, Egypt's Green Building Council (EGBC) introduced the Green Pyramid Rating System (GPRS) for new projects to construct green buildings. The seven major categories of the GPRS include sustainable sites, energy efficiency, water efficiency, materials and resources, indoor environmental quality, management protocols, and innovation and value addition. On the other hand, the TARSHEED rating system, which was created as an upgrade to the GPRS as shown in Figure 2 below, solely considers the performance of sustainable construction in three areas: energy, water, and habitat. However, it ignores the category of waste management, which is one of Egypt's major challenges.



Figure 2. Standards and Rating Systems Used in Egypt

Source: The authors

Institutional Framework: Establishing the Egypt Green Building Council

The EGBC was established in 2009 to strengthen the provisions of the building codes related to energy efficiency and environmental preservation by encouraging investors to adopt the Building Energy Efficiency Certificate (BEEC) code. Although the EGBC created the GPRS, it still lacks the incentive scheme for the acting parties to implement the green building strategy in their pertinent projects, which is one of the gaps in the usage of sustainable building methods and approaches that this policy paper addresses.

International and Regional Experiences: Sustainable Cities and Buildings

Good practices from international experiences establish sustainable cities and buildings through adopting resource efficiency, waste management, and regulations (such as UAE, UK, Morocco, India). There are significant projects in Egypt that are in line with global practices such as the COP27 Presidency Sustainable Cities Initiative. Most regional case studies on establishing sustainable cities rely on adopting good practices for resource efficiency and waste management, while other case studies on sustainable buildings focus on tailoring policies, laws, and codes. Designing awareness tools is the common element in the analyzed case studies. Almost 26% of those case studies (around 20 case studies) use awareness tools to include all key stakeholders and thus effectively establish sustainable cities and buildings. Similarly, about 26% of the case studies adopt policies, while over 42% of them focus on resource and energy efficiency and about 5.3% adopt waste management techniques.

Stakeholders Mapping

Through the research and 11 conducted interviews with key stakeholders, Figure 3 illustrates the power-interest grid of the main stakeholders in the field of sustainable construction and buildings. The bottom left corner represents the stakeholders who are of low-power interest and who require monitoring. The bottom right corner represents those in the low power-high interest category, who should have their power increased. As for the top half corner, it represents those of a high power-low interest, who need to be kept informed. The top right corner represents the high power-high interest stakeholders who are the key players. The in-between stakeholders are those who are neither high or low but rather variations of the scale across a spectrum.

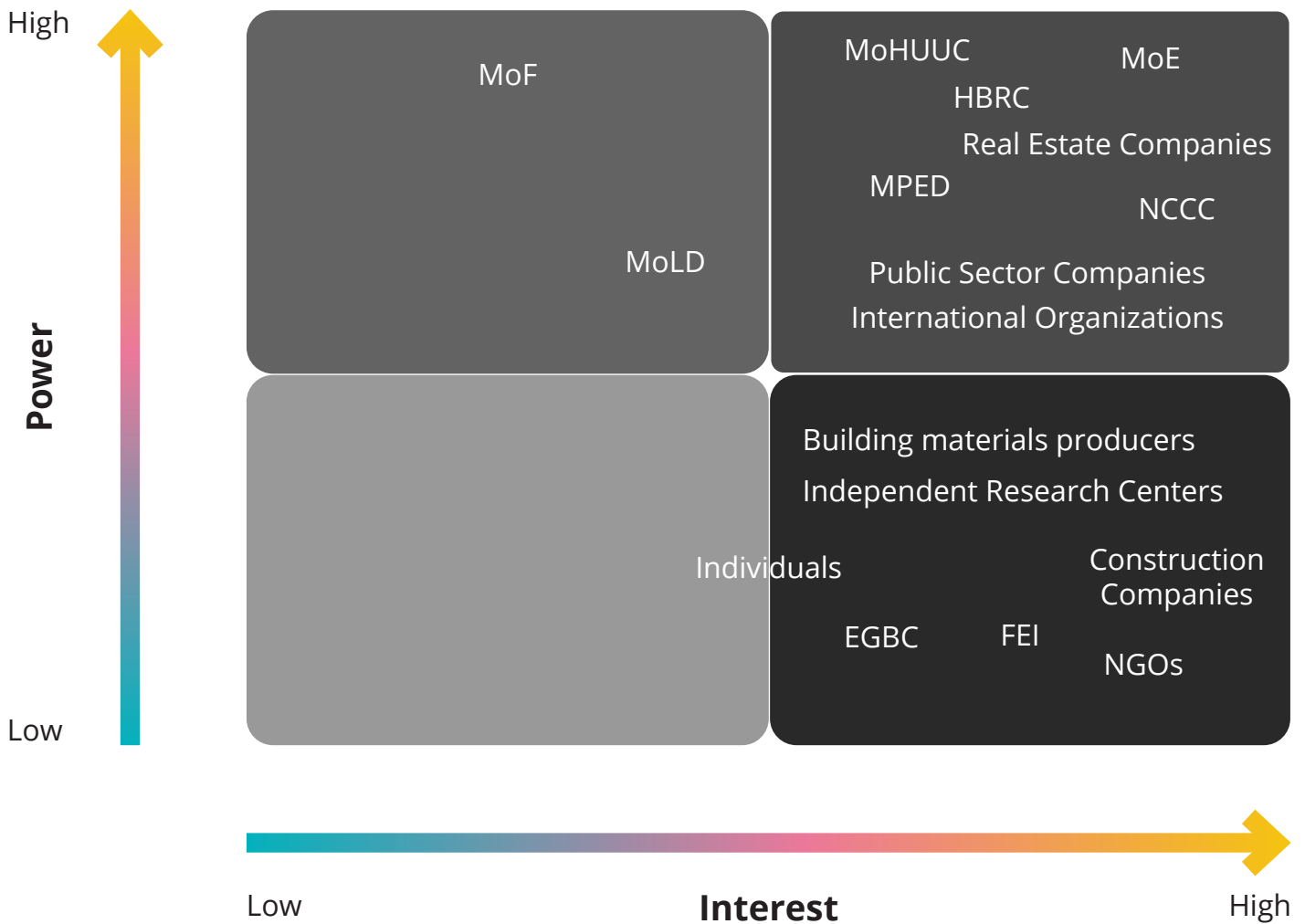


Figure 3. Power-Interest Grid Analysis of Key Stakeholders

Source: The authors

II. Integrative Policy Options Framework and Criteria Analysis

Egyptian policymakers should consider sustainable building and construction as an interdisciplinary strategy to establish sustainable cities and hence mitigate the impact of climate change. An integrated strategy of three proposed policy options is thus recommended. The policy options are divided into three stages of implementation that target the entire value chain of the construction sector. As for the policies assessment for implementation, the selected criteria are effectiveness and efficiency, the level of collaboration across phases, and long-term benefits and gains. The main criteria are selected on the basis of analyzing the process, the outcomes, and the longevity of each proposed policy option. The results are that proposed option B acquires the highest weight, while the proposed policy option A acquires the least. The weights reflect the overall level of convenience for implementing the policy option in the field in order to divide the policy options into stages.

Proposed Policy Options A: 'Greening' Existing Building Laws and Developing National Standards for Sustainable Construction Materials

- Reformulating the current regulatory and legislative frameworks to integrate the standards for implementing sustainable construction, considering the different building materials, in a specific timetable.
- Providing packages of financial incentives such as reducing building licensing fees, land prices reduction, increasing the period of payment of installments, speeding up the licensing process, exemptions from real estate taxes, and reduction in contracting fees for facilities.
- Offer in-kind incentives through a reduction in the initial and recurring utility cost and adding an extra assessment score in the selection criteria for considering sustainable construction techniques.
- Developing building materials standards derived from green building codes that have a long-term type of implementation to become mandatory.

Proposed Policy Option B: Providing Finance and Awareness Campaigns to Promote Sustainable Construction

The second proposed policy option is a straightforward short-term implementation of incentives and awareness interventions. This type of proposed policy options is considered an executional type through two tools:

- Incentive schemes as green financing mechanisms, and facilitative schemes through installments for land prices, technical support and assistance, and reputational green labeling.
- Awareness tools as media-based campaigns, and education.

Proposed Policy Option C: Establishing a National Sustainable Construction Working Group

The third policy option C covers an integrated stakeholder framework of cooperation. It is a medium-term implementation framework type that proposes:

- Re-mandating the under the National Council for Climate Change (NCCC) to include a representative from the Ministry of Housing, Utilities, and Urban Communities (MoHUUC) as the Prime Ministerial Decree No. 1129 of 2019 for the organizational structure of the NCCC stipulates no membership of MoHUUC.
- Establishing a third technical working group called the "Sustainable Construction Working Group" under the NCCC
- Developing a national strategy for sustainable construction in Egypt to operationalize the sustainable construction framework.

III. Conclusion and the Way Forward

This policy paper includes a comprehensive research analysis of the problem and insights from 11 interview data with different representatives from key stakeholders. A select number of international and national case studies and projects were analyzed from the construction and building market with their laws and processes.

Accordingly, the paper formulates an integrated strategy and implementation plan for achieving sustainable construction in Egypt in three complementary policy options divided into stages, given the construction sector's complexity through its value chain. Accordingly, the paper recommends that decision-makers must apply the sustainable construction strategy of three policy options in line with each other, starting with the policy option that has the highest weight until reaching to apply the policy option of the least weight, as shown in Figure 4 below.

Schemes and Policies	Policy Option A	Policy Option B	Policy Option C
Scheme 1	Integrating Green Building Codes with Laws for Existing and New Buildings	Creating Programmatic Incentive Schemes through Green Financing and Facilitative Schemes	Re-mandating the NCCC to Include a Representative from MoHUUC across all 3 Organizational Structure Levels
Scheme 2	Creating Incentive Schemes in Laws and Regulations (Financial and In-Kind)	Spreading Awareness through Media-Based Campaigns	Establishing a Third Technical Working Group as the "Sustainable Construction Working Group" under the NCCC
Scheme 3	Adopting National Standards for Sustainable Construction Materials' Production	Spreading Awareness through Developing Education, Trainings, and Utilizing NGOs' Support	Developing a National Strategy for Sustainable Construction in Egypt
Lead Implementing Stakeholders	-MoHUUC -House of Representatives -MoF	-CBE -MPED -Insurance Companies -MoHUUC -MoE -MoETE -NGOs	-MoHUUC -Prime Minister -Steering entities in NCCC: MoE, EEA, and UNFCCC Focal Point

Figure 4. Sustainable Construction Strategy Implementation Plan and Schemes

Source: The authors

«All the academic references used in this brief are mentioned in the policy paper.»

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