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AN ARCHITECTURAL LANGUAGE BETWEEN CULTURE, NATURE, AND JUSTICE: THE INTELLECTUAL LEGACY OF HASSAN FATHY

UMA LINGUAGEM ARQUITETÔNICA ENTRE CULTURA, NATUREZA E JUSTIÇA: O LEGADO INTELECTUAL DE HASSAN FATHY

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Abstract
This study examines the sustainable architecture approach of the Egyptian architect Hassan Fathy, analyzing its cultural, environmental, and social dimensions to investigate the unique balance he established between traditional knowledge and contemporary needs. Fathy's architectural vision developed an alternative understanding of modernity based on using local materials, passive climate control strategies, user participation, and cultural sensitivity. The projects it has carried out, especially in the New Gourna Village, have been evaluated as physical structures and models for education, social transformation, and preserving local identity. Fathy's approach presents a pioneering paradigm that aligns with today's concepts of sustainable architecture, climate-friendly design, and social justice. The article systematically analyzes Fathy's design principles based on a literature review, while also evaluating the impact of his legacy on contemporary architectural discourse and practices. In this context, the study offers suggestions on how Fathy's ideas can inspire future architectural practices and sheds light on how the wisdom of the past can be re-evaluated for sustainable urbanization.

Keywords: Spatial Justice. Social Equity. Cultural Heritage. Participatory Design. Sustainable Architecture.

Resumo
Este estudo examina a abordagem de arquitetura sustentável do arquiteto egípcio Hassan Fathy, analisando suas dimensões culturais, ambientais e sociais para investigar o equilíbrio único que ele estabeleceu entre o conhecimento tradicional e as necessidades contemporâneas. A visão arquitetônica de Fathy desenvolveu uma compreensão alternativa da modernidade baseada no uso de materiais locais, estratégias de controle climático passivo, participação dos usuários e sensibilidade cultural. Os projetos que ele realizou, especialmente na Nova Vila Gourna, foram avaliados como estruturas físicas e modelos para educação, transformação social e preservação da identidade local. A abordagem de Fathy apresenta um paradigma pioneiro que se alinha com os conceitos atuais de arquitetura sustentável, design ecológico e justiça social. O artigo analisa sistematicamente os princípios de design de Fathy com base em uma revisão da literatura, ao mesmo tempo em que avalia o impacto de seu legado no discurso e nas práticas arquitetônicas contemporâneas. Nesse contexto, o estudo oferece sugestões sobre como as ideias de Fathy podem inspirar práticas arquitetônicas futuras e lança luz sobre como a sabedoria do passado pode ser reavaliada para a urbanização sustentável.

Palavras-chave: *Justiça Espacial. Equidade Social. Patrimônio Cultural. Design Participativo. Arquitetura Sustentável.*

1 INTRODUCTION

In the age of climate change, energy crisis, and ecological degradation, the construction sector has begun to take center stage in environmental sustainability goals. Globally, buildings are responsible for approximately 40% of total energy consumption and one-third of greenhouse gas emissions (Abdelsalam, 2014). In this context, sustainable architecture is being redefined not just as an aesthetic or economic preference, but as an environmental imperative. This concept, which has been developing since the 1980s, is based on the idea that buildings should be in harmony with nature, minimize energy use, and be long-lasting.

Sustainability is not limited to energy efficiency; rather, it represents a holistic design approach encompassing numerous elements such as material selection, user health, environmental impact, cultural compatibility, and life cycle costs. Today, an increasing number of countries demand that the architecture discipline play an active role in combating the climate crisis through green building certifications (LEED, BREEAM, WELL, etc.). However, the roots of these modern tools are largely based on knowledge systems from the past.

Thousands of years of local architectural practices have been successfully blended with natural climate control, using local materials, and user-centered design. Especially in hot climates, the use of local materials such as adobe, stone, and wood provides thermal insulation with thick walls. At the same time, architectural elements like inner courtyards, high ceilings, and wind towers have achieved thermal comfort without the need for any energy (Mahmoud, Ibrahim & Hassan, 2022). This ancient knowledge is based on passive energy strategies that modern architecture has "rediscovered" but have been practiced by local populations for centuries. Courtyard house typologies, particularly common in the Middle East and North Africa, not only balance the day-night temperature differences but also offer privacy-focused spaces suitable for social life. Similarly, designs such as the badgir (windcatcher) systems used in Iran or the jaali elements in India have provided simple yet effective solutions to climatic challenges (Saylam, 2024). Such solutions are of great value not only from an environmental perspective but also in terms of cultural sustainability.

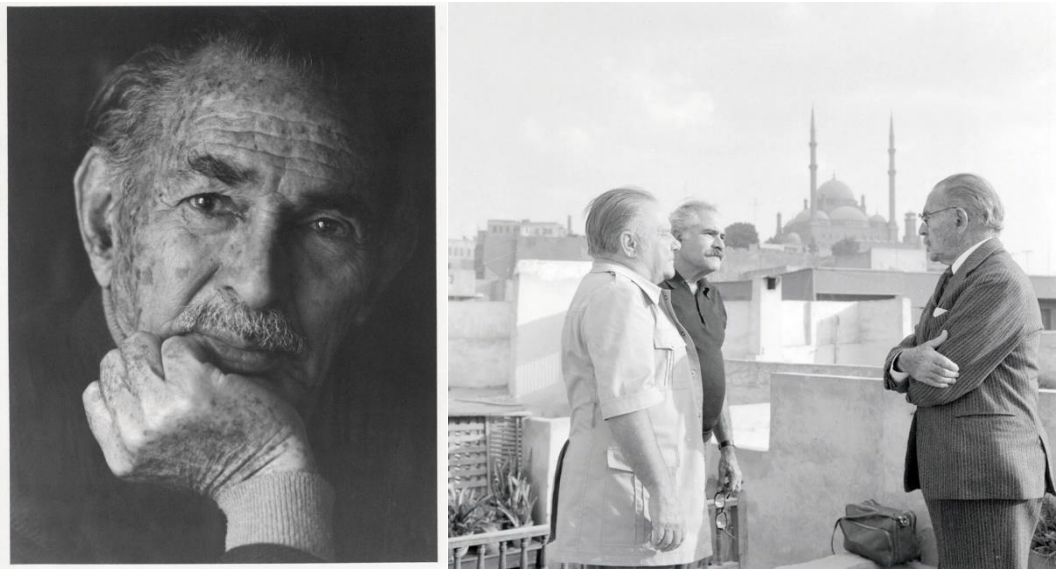
At this point, traditional architecture appears to offer a powerful repertoire of solutions for achieving advanced sustainability goals, going beyond merely a nostalgic

alternative to modern architecture (He et al., 2024). Innovation in sustainable architecture often involves synthesizing the wisdom of the past with current technologies. Moreover, this approach is not only important from a climate perspective but also because of its potential to generate low-cost solutions during economic crises.

The environmental impact of buildings is not limited to carbon emissions during the construction phase. Factors such as the energy needs that arise during the lifespan of a building, the renewability of the materials used, and transportation and maintenance requirements are also included in the scope of sustainability. Traditional structures are noteworthy in this regard; they are typically built with local materials sourced from their region, shaped with local craftsmanship, and have endured for generations with minor interventions. The Egyptian architect Hassan Fathy is one of the most important representatives of this approach in architectural history. Fathy, (Figure 1) who was active in Egypt in the mid-20th century, became one of the pioneers of sustainable architecture by integrating traditional building techniques with modern design. His efforts to produce high-quality, climate-resilient, and culturally sensitive housing, especially for the poor, have earned him a unique place in architectural history (Reynolds, 2024).

Figure 1

a. Fathy's portrait (left) b. Lawrence Durrell, Dimitri Papadimos and Hassan Fathy (right), in Cairo



Source: africanscolumn.com/celebrating-hassan-fathy-the-architect-of-the-poor/

Fathy's design philosophy is not limited to purely formal concerns but encompasses ethical, cultural, and sociopolitical dimensions. This approach, summarized by the slogan "architecture for the poor," aimed to incorporate the local people's wisdom, materials, and labor into the design process (Qamar & Sanyal, 2021). In this respect, Fathy is not only an architect but also a social reformer and advocate for cultural sustainability. Instead of blindly imitating Western modernism, he advocated for an architectural approach aware of local potential.

Today's architecture, especially in developing countries, must benefit far more from this accumulated knowledge of the past. The growing population, the effects of the climate crisis, and the strain on cities' carrying capacities cannot be balanced by technical solutions alone; overcoming these problems requires approaches that increase social participation and cultural connection. Fathy's work could be a guide in this regard. As he suggested, the architect is not merely a designer; they are also a facilitator, educator, and carrier of cultural memory. Examining Fathy's work is not just satisfying historical curiosity, but also a forward-looking learning process. Today's architectural practice, while grappling with climate change, energy scarcity, and sociocultural divisions, must prioritize local knowledge, user participation, and design that is compatible with natural systems, as suggested by Fathy. Indeed, many of today's climate-friendly architectural movements (such as Earthship structures, natural building workshops, and permaculture designs) are essentially different geographical manifestations of Fathy's legacy.

This article examines the historical roots of sustainable architecture and the influence of traditional building knowledge on contemporary practices, using the legacy of Hassan Fathy as a case study. Fathy's design principles, example projects, challenges he faced, and his impact today are examined from an interdisciplinary and cultural perspective, and recommendations are developed for today's and future climate-sensitive design approaches. In this context, the research questions of this study are as follows:

RQ1. How did Hassan Fathy integrate his architectural approach, local knowledge, and traditional building techniques into sustainable design principles?

RQ2. How did social participation and cultural values shape Fathy's understanding of sustainability in his architecture?

RQ3. How does the principle of "architecture for the poor" contribute to the social justice and economic sustainability dimensions of architecture?

RQ4. In what ways has Fathy's intellectual legacy influenced discussions on sustainability and cultural identity in contemporary architecture?

2 FROM MODERNIST DISCOURSES TO SUSTAINABLE ARCHITECTURE: REPOSITIONING LOCAL KNOWLEDGE

At the beginning of the 20th century, along with the global wave of modernization, there were also radical changes in the understanding of architecture. During this period, design processes have increasingly moved away from the local context and climatic data. In those years, the dominant "International Style" encouraged shaping buildings according to universal standards and disregarding the concept of "place." The famous modernist architect Le Corbusier's statement "a house is a machine for living" prioritizes functionality, while seemingly ignoring the relationship with nature, climate, and culture. This approach has, over time, led to the production of energy-intensive and environmentally problematic structures, especially in hot climate zones (Giedion, 1941).

However, when examining architectural history, it is evident that local architecture, thanks to its thousands of years of accumulated knowledge, offers solutions that are compatible with environmental conditions. Even in periods when humanity did not have modern technologies, designs were developed by considering the climate of the geography they lived in; architecture was shaped in harmony with nature and in alignment with resources. In this context, local architecture should be considered not only an aesthetic form but also a highly functional knowledge system in terms of sustainability (He, Yuan & Ma, 2024).

Architectural solutions developed especially in hot and dry climate regions are concrete examples of this. Elements commonly found in the Middle East and North Africa, such as thick adobe walls, high-ceilinged volumes, inner courtyards, and wind towers, demonstrate how passive climate control strategies were implemented thousands of years ago. Thick walls, thanks to their high thermal mass, provide thermal comfort by delaying the transfer of daytime solar heat to the interior. Thanks to this feature, the indoor air temperature, balanced by the evening coolness, makes life inside the building much more comfortable (Mahmoud et al., 2022). Inner courtyards not only provide thermal benefits but also serve as the focus of social life. The courtyard house typology, common in the Middle East, Iran, Anatolia, and the Mediterranean basin, is highly effective in

terms of both privacy and air circulation. The surfaces of the courtyard that cool down overnight continue to provide coolness to the interior during the day. Additionally, water features (salsabil) and green landscaping placed in the center of the courtyard create a microclimate, maintain humidity balance, and cool the air (Mutlu Danacı & Bakır, 2013).

Similarly, wind towers (malqaf), widely used in Iran and Egypt, capture air currents thanks to their height and direct them into the building's interior, allowing hot air to escape upwards. This passive ventilation method, which is shown as an alternative to energy-consuming mechanical ventilation systems today, is quite valuable in terms of energy saving (Saylam, 2024).

Sustainability in local architecture is not limited to just climatic advantages. This type of architecture reduces the carbon footprint through the use of local materials, lowers production costs, and supports the local economy. Natural materials like adobe, stone, wood, and bamboo cause minimal environmental damage; moreover, since they can be sourced directly from their local areas, they also reduce carbon emissions from transportation. Additionally, these materials are recyclable or biodegradable at the end of their lifespan (Reynolds, 2024).

In the mid-20th century, rapid urbanization largely severed the connection with traditional architecture, especially in developing countries. Along with colonization, Western architectural norms were imposed on many societies, and local construction techniques were abandoned, considered a sign of "backwardness." Reinforced concrete structures, glass-fronted buildings, and flat-roofed residences have replaced them. However, these structures have created serious long-term problems, particularly in hot climates, due to inadequate thermal insulation, high energy requirements, and cultural incompatibility (Abdelsalam, 2014).

With the oil crisis of the 1970s and the rise of environmental movements, energy efficiency has reentered the architectural agenda. Concepts such as passive climate control, natural ventilation, and using local materials have regained importance; approaches like "ecological architecture" and "bioclimatic design" have emerged. In this process, traditional architecture has been re-evaluated and has begun to be studied by modern designers, almost like a laboratory (Qamar & Sanyal, 2021).

In this context, Hassan Fathy stood out as an architect ahead of his time. From the 1940s onward, he blended elements such as adobe, courtyards, and wind towers with modern planning approaches in his projects in Egypt, creating an architectural model

where the local population participated in production and lived in harmony with nature. Fathy's work, Architecture for the Poor, introduced this understanding to the world and demonstrated that local architecture can offer functional and aesthetic solutions even in the modern world (Mahmoud et al., 2022). Today, international certification systems like LEED and BREEAM institutionalize Fathy's legacy at a technical level with their criteria promoting energy efficiency. These systems have brought the fundamental principles of sustainable design back to the forefront by rewarding elements such as natural ventilation, passive solar control, and the use of local materials (Hosseini, 2023).

The interaction between climate and local architecture is not merely a physical relationship; it is also a matter of cultural harmony. While modern designs that ignore the knowledge accumulated from the past may offer quick solutions in the short term, they fall short in terms of environmental, economic, and sociocultural sustainability in the long run. Thanks to architects like Fathy, the passive solutions provided by local architecture have become points of resistance against both the energy crisis and cultural erosion.

3 HASSAN FATHY'S DESIGN PRINCIPLES AND PHILOSOPHY

Hassan Fathy (1900–1989), born in Alexandria, Egypt, was a pioneering architect in the mid-20th century who combined traditional architecture with a modern approach, placing sustainability at the center. His philosophy is not merely aesthetic or technical but based on a holistic understanding that includes cultural, social, and environmental dimensions (Fathy, 1973). Today, Fathy's approach is studied as an exemplary model in architectural history and sustainable development disciplines. The cultural meanings of local materials are central to his design philosophy. According to Fathy, material is not only structural but also a carrier of identity and social value. Therefore, local elements like adobe are seen as a means of cultural continuity beyond economic accessibility. This understanding aligns with today's sustainability principles and emphasizes the importance of production based on local resources. Fathy, by putting this approach into practice decades ago, presented a sustainable design model that was ahead of its time (El-Kadi, 2022). Fathy's architecture is explained by breaking it down into the following points.

- Architecture Based on Local Materials and Construction Techniques: At the heart of Fathy's architecture lies the conscious use of local materials and traditional construction techniques. His preference for materials based on regional resources

like adobe is a pioneering strategy that supports economic and environmental sustainability. Considering the high cost and ecological impact of industrial materials, this approach is quite innovative for its time. Adobe provides natural insulation in hot and dry climates, reducing energy requirements; additionally, the public's familiarity with the material facilitates a participatory construction process and allows users to build their own homes. For Fathy, this is not just a technical choice, but an ethical one: the architect sees the use of local resources as a matter of identity and responsibility. He also skillfully assessed the aesthetic potential of local materials, constructing simple, functional structures enriched by light and shadow effects.

- Passive Cooling and Bioclimatic Design: Fathy's architecture takes an approach that is climate-compatible and based on bioclimatic principles. Especially in hot and arid regions, the building form, orientation, and materials are designed according to the climatic conditions. Passive systems such as thick adobe walls, high ceilings, courtyards, and wind towers naturally regulate the indoor temperature and minimize energy consumption. While wind chimneys directed airflow, eliminating the need for mechanical cooling, courtyards created a microclimate that enhanced air circulation. The water features and landscaping have increased both thermal comfort and psychological well-being. Fathy, with this approach that does not conflict with nature, combined energy efficiency with environmental ethics and aesthetic integrity, and pioneered contemporary sustainable architecture (Fathy, 1986).
- User Participation and Socio-Cultural Sensitivity: Fathy saw architecture not just as a physical production, but as a tool for social transformation. By involving users in the design process, it aimed to directly understand their needs and values; it produced solutions suitable for cultural practices, especially by working with the public at the village level. This participatory approach has transformed the public from passive users to active producers, strengthening the sense of belonging to the structures. In the process, traditional techniques were relearned and local knowledge was revitalized. Fathy saw the people not as "passive recipients" but as productive partners, thus supporting social and economic sustainability together. This understanding has created a model that has pioneered today's community-based design approaches (Ali, 2015).

- Spatial Organization and Privacy: Fathy's understanding of space is not merely a functional arrangement, but a reflection of social values in space. Considering the concept of privacy in Islamic culture, they often designed their homes around inward-facing courtyards. This arrangement provided both climatic comfort and privacy. Courtyard-centered plans offer a balanced living space with simple facades and spacious interiors. Guest areas (qa'a) are clearly separated from family private areas. This spatial strategy also supports social interaction and family communication. Fathy integrated human behavior, traditions, and lifestyles into his designs, placing the cultural context at the center of his planning decisions. For her, privacy is not just physical, but a spatial strategy; in this respect, her designs represent both cultural sensitivity and a user-centered approach (El-Kadi, 2022).
- Reinterpretation of Traditional Forms in Architectural Esthetics: Fathy's aesthetic understanding goes beyond formal beauty, reflecting cultural continuity and historical memory. He has reinterpreted elements characteristic of traditional Egyptian architecture, such as domes, vaults, arches, and latticework, and combined them with contemporary functions. These forms have not only produced nostalgic elements but also climatic and functional solutions. While mashrabiyas filter the sun and provide privacy, domes facilitate air circulation. Fathy's approach relies on the simple elegance of form rather than ornamentation; this attitude aligns with the concept of "formal humility" in Islamic art.. Instead of imitating traditional forms, he has created a unique language by blending them with modern spatial arrangements. This aesthetic approach has created a sense of belonging in their structures by providing both cultural identity and innovative integrity (Richards et al., 1985).
- Architecture as a Tool for Educational and Social Transformation: Fathy saw architecture not just as building production, but as an educational tool that transforms society. He advocated for people, especially in rural areas, to gain the knowledge and skills to build their own homes. To this end, practical workshops were organized with the public, teaching traditional techniques such as adobe construction and dome building. The participation of the public not only as labor but also as conscious creators in the process has strengthened the sense of belonging and facilitated knowledge transfer. He placed architecture at the service

of social justice with the principle of "architecture for the poor," and opposed elitist approaches. Fathy's profile as a teaching and learning architect has been emulated in architectural education; his books have become course material in many faculties. His pedagogical approach is a precursor to the concept of "community-focused design," which advocates for the democratization of architecture and public participation (Ali, 2015).

- Economic Sustainability and Resource Efficiency: Fathy's architecture prioritizes not only environmental sustainability but also economic sustainability. According to this, a good structure should not only be suitable for the climate conditions but also appeal to the economic power of the local people. Therefore, instead of expensive modern materials, he used local and low-cost resources and utilized local labor in production. This approach both reduced costs and supported the local economy. Natural materials like adobe are inexpensive, energy-efficient, and environmentally friendly compared to cement or steel. Fathy simplified the construction process, reducing dependence on external sources and promoting self-sufficiency. This approach has provided applicable solutions to low-budget housing problems in developing countries. The project budget, energy efficiency, and ease of maintenance were considered based on the principle of "achieving a lot with little resource." Durable and long-lasting structures have also created a sustainable model regarding life cycle costs (El-Kadi, 2022).

Fathy's architectural approach holistically addresses the environmental, social, and economic sustainability dimensions. The key elements of this multi-layered approach are systematically presented in Table 1.

Table 1

Design Principles, Focus Points, and Key Concepts in Fathy's Architectural Approach

Principle	Focus	Short explanation	Key concepts
Architecture Based on Local Materials and Construction Techniques	Material & production method	An approach that supports environmental and economic sustainability through the use of local resources (especially adobe), while preserving region-specific building techniques.	Local materials, adobe, craftsmanship, low carbon
Passive Climate Control and Bioclimatic Design	Energy efficiency & climate adaptation	A design philosophy that reduces energy consumption by providing natural climate control through elements such as thick walls,	Passive systems, microclimate, thermal comfort

		courtyards, and wind towers, and is in harmony with nature.	
User Engagement and Socio-Cultural Sensitivity	Social participation	An architectural approach that fosters a sense of belonging and social sustainability by ensuring the active participation of the public in the design and construction process.	Participatory design, local community, socio-cultural sustainability
Spatial Organization and Privacy	Cultural spatial order	The use of courtyard-centered and inward-facing spatial arrangements in accordance with the value of privacy in Islamic culture.	Privacy, inner courtyard, public-private space balance
Reinterpretation of Traditional Forms in Architectural Aesthetics	Aesthetics & cultural identity	Creating an aesthetic language that is both distinctive and sustainable by combining traditional Egyptian forms and motifs (domes, arches, latticework) with contemporary functions.	Cultural continuity, formal modesty, modern interpretation
Architecture as a Tool for Educational and Social Transformation	The educational role of architecture	An approach that encourages knowledge transfer, technical learning, and the democratization of architecture by involving the public in the building production process.	Education, public participation, and social reform
Economic Sustainability and Resource Efficiency	Economics & resource management	A design approach that aims for economic accessibility and resource efficiency through low-cost, locally sourced, and long-lasting structures.	Low cost, self-sufficiency, life cycle cost

4 HASSAN FATHY'S PRACTICES: NEW GOURNA AND OTHER PROJECTS

Hassan Fathy's architectural practice has materialized in various projects, going beyond being a theoretical discourse. At the forefront of these projects is the New Gourna Village, recognized by UNESCO as a cultural heritage site. Fathy's primary goal in this project was to build a contemporary village using traditional construction techniques and implement a social architectural model centered on the local community's needs. The project was initiated in 1945 at the request of the Egyptian government and was implemented between 1946 and 1952. In the ancient village of Old Gourna, near Luxor, it was planned to relocate the people, who were to be displaced for damaging ancient burial sites, to a new settlement. Fathy saw this relocation process as a physical transfer and a comprehensive opportunity for social transformation, bringing together the traditional and the modern.

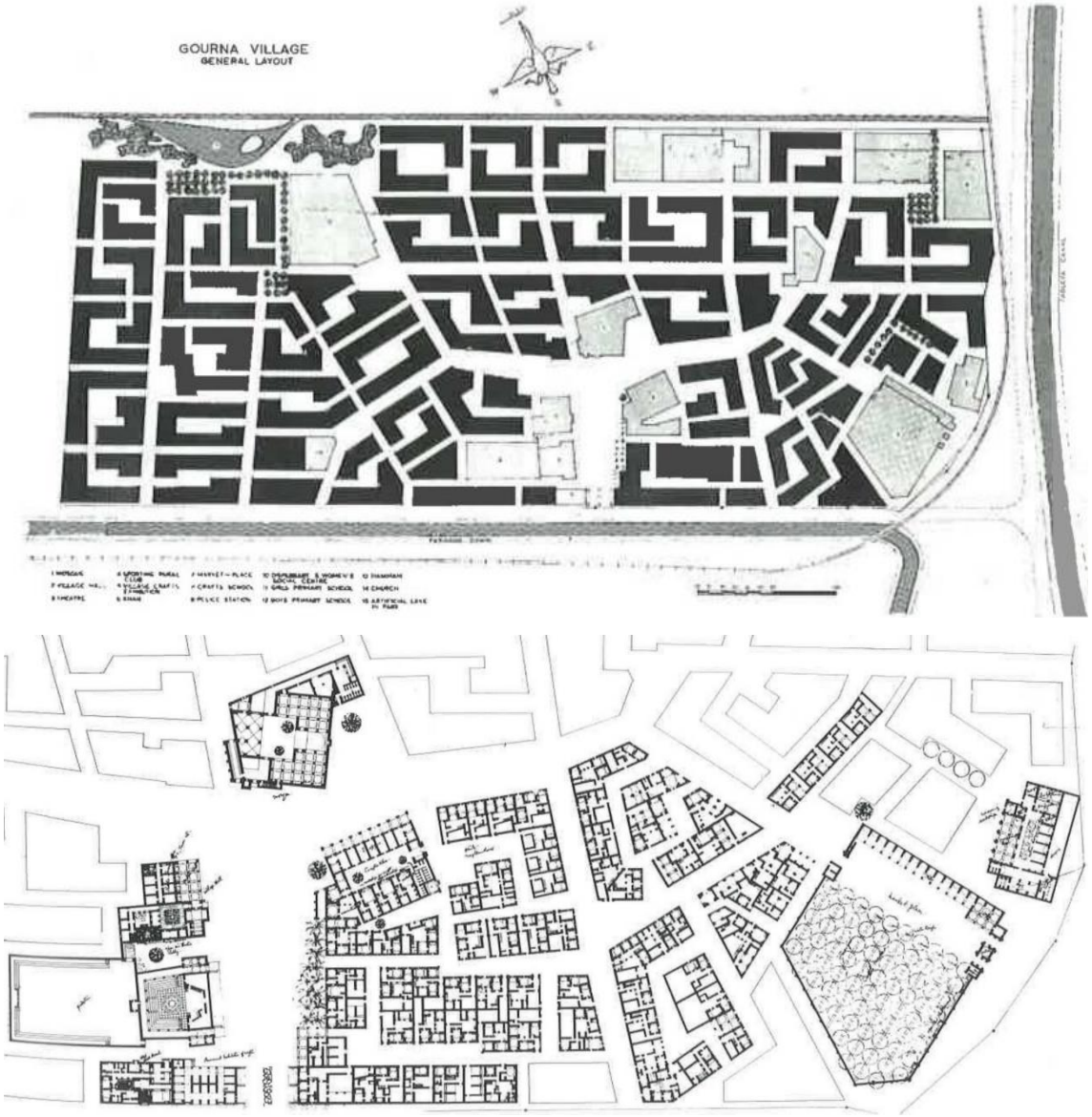
During the design process, Fathy emphasized understanding the local people's cultural habits and lifestyles by maintaining close contact with them. This participatory approach is perhaps one of the earliest examples of the concept of "community-based

design" in architecture (Pyla, 2007). In New Gourna, adobe bricks, almost entirely produced locally, were used as building material. This material offered a solution that was both environmentally sustainable and financially accessible. Fathy aimed to build economical and climate-resilient structures using local materials such as adobe and stone (Nessim et al., 2023). One of the most important aspects he focused on during the construction process was integrating traditional passive climate control elements such as wind towers, domes, and courtyards into the structure. In this way, cool and comfortable indoor environments could be created in buildings within a hot desert climate without energy consumption (Mahmoud et al., 2022). Fathy also involved the villagers in the construction process, transforming them from passive users into active participants in production. The villagers were personally involved in many stages, from producing adobe bricks to building the dome, which resulted in both economic savings and the revival of traditional construction techniques that were on the verge of being forgotten. As a result of this approach, the villagers became the architects of their own homes and developed a strong sense of belonging to the resulting structures.

The urban planning of New Gourn (Figure 2) a was not limited to individual housing; it was designed as a holistic living space, including public buildings such as a village mosque, marketplace, school, inn, and even an open-air theater. Fathy took care to preserve the social fabric at the neighborhood level; the streets were designed with an organic layout, in the form of narrow and shady passages, providing comfortable movement in the hot climate. Public buildings were strategically placed to ensure every household could easily participate in community life. Inspired by traditional Egyptian architecture, the domed and courtyard house typologies have been reinterpreted to meet contemporary needs (Abdelsalam, 2014). Thus, while aesthetic integrity was preserved throughout the village, housing of different sizes and typologies was able to meet the changing needs of the people.

Figure 2

Fathy's New Gourna Masterplan (up) and Ground floor plan



Source: https://medium.com/@asibahi/hassan-fathy-and-the-new-gourna-experiment-5cbd0b286d2a

Although the project was designed with an idealistic approach, various challenges were encountered during implementation. Some of the local population found it difficult to adapt to the new way of life; the break from traditional habits progressed more slowly than expected. For example, some villagers refused to move into these dwellings due to superstitions that they considered the domed new houses to be "nests of jinn" (Fathy, 1973). Also, only about half of the approximately 900 housing units planned for construction have been completed. Although government support was initially strong, its weakening over time led to the project being partially unfinished. Insufficient financial

resources and infrastructure deficiencies have prevented the village from growing and operating on the scale that was envisioned. The expected commercial vitality was not achieved in the village, where economic units such as the planned marketplace and handicraft workshops could not be brought to life. Some structures, however, have begun to deteriorate because they haven't received adequate maintenance over the long term. For all these reasons, New Gourna did not become a fully sustainable settlement on the scale Fathy envisioned (Ahmed & El-Gizawy, 2010).

Nevertheless, New Gourna has secured its place in architectural literature not as a failed experiment, but as an extremely bold and instructive experience. Fathy honestly presented both his successes and the obstacles he encountered by detailing his experiences gained throughout the project in his book, "Architecture for the Poor." In this way, New Gourna has become a lesson for future generations. In the academic world, the project has been mentioned within the "alternative modernism" debates; it was described by Malcolm Miles (2006) as a search for "utopia from mud" and cited as an example of non-mainstream pursuits in architecture. Indeed, Fathy's human-centered design principles, low-cost construction techniques, and understanding of sustainability have become concepts frequently referenced even in contemporary architectural education. Fathy's works, especially Architecture for the Poor, are read as textbooks in many universities, and his approach inspires new projects.

Besides New Gourna, there are also important works that embody Fathy's design philosophy. One of these is the Dar al-Islam complex, built in New Mexico in the United States in the 1980s. In a different geographical location, in this region with a desert climate, Fathy created a complex with sustainable and cultural identity in the settlement built here, using elements such as adobe, domes, and wind towers. The Dar al-Islam project, consisting of structures such as a mosque, school, and guesthouse, demonstrated the universality of Fathy's principles by adapting the formal language of Islamic architecture to American desert conditions (Reynolds, 2024). Similarly, Fathy also developed settlement proposals for the Nubian people displaced by the construction of the Aswan Dam. The residences he designed as part of the Nubia Project are shaped with an architectural language that is suitable for the region's natural and cultural conditions. Although these proposals could not be fully implemented due to political and economic obstacles, Fathy's plans offered an approach that is still referenced today on issues of

displacement and cultural continuity, so much so that the effects of Fathy's design principles were seen in some settlements built later in the region.

His smaller-scale projects in and around Luxor are also important parts of Fathy's architectural repertoire. These structures include private residences and small public buildings. For example, the arrangement of domed spaces around courtyards in some houses in Luxor is noteworthy, while the facades are designed to be protective against the environment but offer a spacious living area inside. Fathy took care to shape each home according to the family's unique needs; flexibility in design and dialog with the user were prioritized. These projects demonstrate that architecture can impact social life at every scale and context by working in direct contact with the local population. This situation is a reflection of the belief in architecture's power to shape social life (El-Shorbagy, 2010).

Fathy's New Gourna and other projects should not be seen merely as an attempt to build structures. In each of these projects, interaction with the local community, sustainable building techniques, climate-friendly solutions, and the reflection of the socio-cultural context in the design are clearly observed. Fathy's work is pioneering, demonstrating that architecture can reconnect with people, nature, and culture.

5 THE CURRENT STATUS AND IMPACTS OF THE PROJECTS

Over the decades, Hassan Fathy's projects have been reevaluated both in terms of their physical presence and the ideas they put forward. Fathy's ideas have not only remained nostalgic memories but have also become principles that guide contemporary architectural practice. However, the physical condition of the projects has deteriorated significantly over time. Many adobe structures, especially in the village of New Gourna, have been damaged due to long-term neglect and infrastructure problems. This situation also resonated in the international community, and initiatives were launched to preserve Fathy's legacy.

In 2018, the "New Gourna Village Conservation Project" was launched in collaboration with UNESCO and the Egyptian Ministry of Culture, and the first phase of work began between 2019 and 2021. In this context, the current condition of important structures in the village was first documented, traditional construction techniques were analyzed, and the root causes of deterioration were investigated. In many structures, particularly at the foundation level, structural problems caused by rising groundwater

were identified (Szabó et al., 2021). Widespread cracks were identified in the adobe walls, and there were risks of collapse in some areas. Comprehensive restoration practices were implemented in the second phase, which began in 2023. Specifically, the mosque, theater, and caravanserai buildings, which are the iconic structures of the village, were prioritized for repair and strengthening using original techniques (Shalaby & Mostafa Ahmed, 2024). During this restoration process, worn-out elements were renewed while remaining true to the original adobe construction methods, and functionalization plans were developed for the future use of the structures (Figure 3).

Figure 3

Visual Documentation of the Present Condition of New Gourna Village Structures

Source: https://africanscolumn.com/new-gourna-hassan-fathys-visionary-village-named-among-times-worlds-greatest-places-of-2024/

However, preserving an architectural heritage is not possible simply by repairing physical structures. Many researchers emphasize that preserving the spirit of Fathy's projects – that is, the architect's interaction with the local people, his emphasis on cultural identity, and his educational approach – is at least as important as physical restoration (Abdel Tawab, 2018). From this perspective, the local community's involvement in preserving New Gourna is considered a conservation method consistent with Fathy's legacy of "participatory architecture." Indeed, in some buildings whose restoration was completed in 2024, the descendants of the original Gourna people were included in the project by receiving apprenticeship training, thus adopting a model of social sustainability consistent with Fathy's method.

Hassan Fathy's architectural approach continues to influence contemporary architectural discourse and practice in a wide variety of ways. The awarding of the Aga Khan Award for Architecture to Fathy in 1980 was an early indication that his work was being recognized on an international scale. Today, when sustainable architecture and local-focused design are mentioned, Fathy's name is cited as a fundamental reference. His legacy has also become deeply ingrained in architectural education. In many architecture schools, works such as Architecture for the Poor (1973) and Natural Energy and Vernacular Architecture (1986) are considered classic sources of sustainable and community-based design. Fathy's alternative design approach to modernism is mentioned alongside the concept of critical regionalism in contemporary theoretical discussions (Miles, 2006). The localist approach, which draws on the values of its own geography, is presented as a successful example against the uniformity of global modernism. On the other hand, Fathy's passive climate control solutions, such as thick mud-brick walls, wide eaves, wind towers, and the like, are recognized today as fundamental principles in the design of energy-efficient buildings (Mahmoud et al., 2022).

Of course, Fathy's approaches are also subject to criticism. Some academic circles have described Fathy's projects as "utopian," suggesting they would not be successful due to factors such as the difficulties faced by local communities in displacement processes and the inadequacy of state support (Guitart, 2014). However, these criticisms largely point to the difficulties of the socio-political conditions of the time rather than the design vision. Indeed, Fathy evaluated the New Gourna experience not as a "failure," but as a learning process full of lessons, and maintained his belief in his ideal. Today, his ideas offer multi-faceted solutions to the field of architecture, which is grappling with the

climate crisis, energy problems, and social inequality. Fathy's legacy has a broad impact, encompassing building design and dimensions such as social justice, education, the appropriate use of technology, and cultural identity (Abdelsalam, 2014). Especially in developing countries, architectural approaches aimed at empowering local communities and using resources efficiently are inspired by the model put forward by Fathy.

6 CONCLUSION

Hassan Fathy's approach to architecture is so layered and rich that it cannot be limited to mere aesthetic concerns or engineering solutions. His legacy represents a design paradigm that holistically addresses the technical, cultural, and social dimensions of the concept of sustainability. As we have discussed throughout this study, Fathy's vision is still extremely relevant and guiding for contemporary architecture.

Fathy's use of local materials and emphasis on traditional building techniques offer important lessons to contemporary architects regarding energy efficiency, low carbon footprint, and economic accessibility. The strategic use of materials like adobe, stone, and wood in structures provides a cost advantage, enhances user comfort, and enables the preservation of local craftsmanship. In this respect, Fathy treated sustainable architecture as a cultural issue beyond a technical one. His practice has shown that sustainable design is much more successful and enduring when shaped by local resources and knowledge.

Fathy's bold use of passive climate control strategies is an approach that foreshadowed the fundamental principles of contemporary ecological architecture by decades. Elements such as wind towers, thick walls, courtyards, and domes save energy and improve users' quality of life. These design elements perfectly align with the elements that form the essence of the "green building" standards popular today. In other words, Fathy implemented many of the design principles that are now awarded LEED or BREEAM certifications, without the need for any technological infrastructure, but solely based on traditional knowledge. His architecture has proven that modern methods developed to cope with energy crises exist in ancient solutions.

His approach, which places user participation at the center of design, is perhaps one of Fathy's most groundbreaking contributions. As seen in the New Gourna project, involving the people who will use the building in the design and construction processes

has ensured the acceptance and long-term sustainability of the resulting space. This understanding foreshadows concepts emphasized in contemporary architecture, such as participatory planning, user-centered design, and community-based architecture. Fathy defined the architect's role as a facilitator working with the public rather than an authoritarian shaper, developing a perspective on the socio-political dimension of architecture that was ahead of its time.

Similarly, incorporating cultural parameters such as privacy, social interaction, and spatial organization into the design was critically important in Fathy's architecture. The reinterpretation of traditional forms and elements such as courtyards, latticework, and domes has ensured the manifestation of cultural memory in space, making the buildings both familiar and innovative for their users. This architectural approach suggests an alternative path for modern architecture, demonstrating that a design respectful of traditional values but responsive to contemporary needs is possible.

Fathy's legacy also includes considering architecture as a tool for educational and social transformation. In the projects he carried out in rural areas, the education and participation of the people in the process not only physically transformed those communities but also instilled in them self-confidence and skills. In this respect, Fathy placed architecture at the service of society, demonstrating that the profession is not solely the domain of experts and that it becomes even stronger when shared with the public. His ideal of "architecture for the poor" is an extremely valuable principle that highlights the role of architecture in struggles for social justice and equality.

Fathy's projects, especially during the implementation phase, had aspects that everyone did not easily accept. As in the case of New Gourna, there were difficulties in the adaptation of communities that had lived in the same place for years to a new order; established cultural habits resisted change. From this perspective, some consider Fathy's vision too idealistic. However, it should not be forgotten that these kinds of difficulties do not invalidate Fathy's approach, but rather reveal how strong and decisive the social dimension of architecture is. Indeed, while Fathy openly expressed the obstacles he faced in his works, he never compromised on the truth of the principles he defended. The lessons learned from his experiences are extremely valuable for today's architects.

Although this study comprehensively addresses the multi-layered approaches Hassan Fathy brought to architecture, it does have some limitations. First, since the study's main basis is literature review and secondary sources, an observational or user

experience-based dataset on the current field status of Fathy's projects could not be presented. Additionally, comparative analyses of how Fathy's architectural approach was adapted in different geographies were not included. Therefore, in future research, these shortcomings can be addressed through qualitative interviews with contemporary architects who apply Fathy's principles in different cultural and climatic contexts, field studies, and built environment analyzes.

Hassan Fathy's contributions to architecture have created a wide-ranging impact, extending from local Egyptian contexts to global sustainability discussions. His work represents a holistic approach to architecture that offers the wisdom of the past as a solution to today's problems and centers on humanity, nature, and culture. This approach demonstrates that a climate-resilient and socially just built environment is possible, while also providing a strong roadmap for architects, urban planners, and policymakers. The increased emphasis on using local materials, social participation processes, and climate-compatible design principles, particularly in contemporary architectural education, is of great importance for integrating Fathy's legacy into current practices. When developing sustainable housing production strategies in developing countries, Fathy's practices can be considered a "living laboratory" for the younger generation. By blending his principles with digital technologies and contemporary building systems to develop hybrid models, future research will enable the creation of innovative solutions that preserve the local context and contribute to global sustainability goals. Fathy's legacy is not just a historical memory but a living and inspiring guide for those who wish to build a sustainable future.

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Authors' Contribution

Both authors contributed equally to the development of this article.

Data availability

All datasets relevant to this study's findings are fully available within the article.

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