ENCHANCING URBAN DEVELOPMENT THROUGH SLUM UPGRADING:

A CASESTUDY OF THE MAKOKO FLOATING SCHOOL IN LAGOS, NIGERIA

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"Half building, half boat"....Freason (2014). Image of the Makoko Floating School. Source: Amy Frearson, Dezeen Magazine. (Available online: https://www.dezeen.com/2014/03/25/makoko-floating-school-nigeria-nle/)

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Introduction

Residents of squalid and overcrowded urban streets face various hardships, including lack of access to essential amenities such as schools. In response to this, the Makoko community took the initiative to construct a school. Although, the floating school project was only successful for four months, it held significant importance for Makoko residents who saw the structure as much more than just a "worthy prototype for future innovations", contrary to the beliefs of some architects (Leardi, 2018). Furthermore, Leardi emphasized that launching the Floating School elevated Makoko's reputation both locally and internationally. However, this event sparked controversies, with some questioning whether the Floating school was a genuine attempt to do good or merely a reflection of the architect, Adeyemi's growing ego in search of fame? As Gaestel points out, "Heroes and villains are rarely pure" (Leardi, 2018).

The Makoko Floating School illustrates how slum upgrading can benefit residents of slum communities. According to Frearson (2016), the school was developed with significant input from the local community, who worked closely with the architect, Kunle Adeyemi, to ensure that the design reflected their needs. He stated that the partnership between the community and the architect fostered a sense of ownership and ensured that the school was well-embraced by the residents. As noted by Frearson (2016), the community effectively utilized locally available resources within their disposals, such as wood waste, locally grown bamboo, plastic drums, nails, hammers, etc., during the construction process. By sourcing materials locally, the project not only supported the local economy but also helped in reducing construction costs.

Furthermore, the floating school embodies the concept of frugal innovation by demonstrating simple yet innovative solutions while addressing complex challenges such as access to schools in flood-prone areas like Makoko. By leveraging on local resources and knowledge, the project highlights the importance of adapting interventions to suit the needs of slum settlements.

Development of slum upgrading

Slum upgrading is a critical issue in urban development, especially in the Global South where a large portion of the urban population resides in informal settlements. Francoise (2006) highlights the four phases of "slum approach", with the first phase occurring between the 1950s and 1970s, during which time slums were acknowledged as the outcome of a "transitional process" caused by a large amount of rural migration. He further stated that urban planners at the time used the opposing ideologies of modernization and decolonization as justification for demolishing slums. In an effort to improve living conditions, slums were renovated during the second phase, which began in the 1970s. Initiatives to improve living conditions in slums were led by international organizations like the World Bank and UNICEF. The third phase which began in the 1990s, concentrated on rehabilitation and resettling methods for slum residents. The UN-HABITAT Declaration of 2004/2005, which aimed to improve living conditions and lessen poverty for over 100 million slum dwellers by 2020, was a product of the fourth phase (Francoise, 2006, in Adedayo

et al., 2016 p. 15). Taking everything into account, these phases demonstrate a change from viewing slums as unintentional consequences of urbanization to recognizing them as complex environments in need of targeted interventions to improve living conditions and lessen social injustices. Authors such as David Satterthwaite, a senior fellow at the International Institute for Environment and Development (IIED), have extensively researched and written about slum upgrading. Satterthwaite's research lays emphasis on how crucial it is for slum upgrading programs to have major community participation, local governance, and sustainable infrastructure development.

Slum Formation

In the diagram below, income inequality and urbanization play significant roles in the formation of slums. Nonetheless, one critical factor that sustains the cycle of hardship and poverty within slums is the absence of educational opportunities. The lack of access to basic education, has limited slum residents with little or minimal chances for upward mobility and socio-economic improvement. Additionally, social marginalization and inadequate support from the government also intensify these challenges.

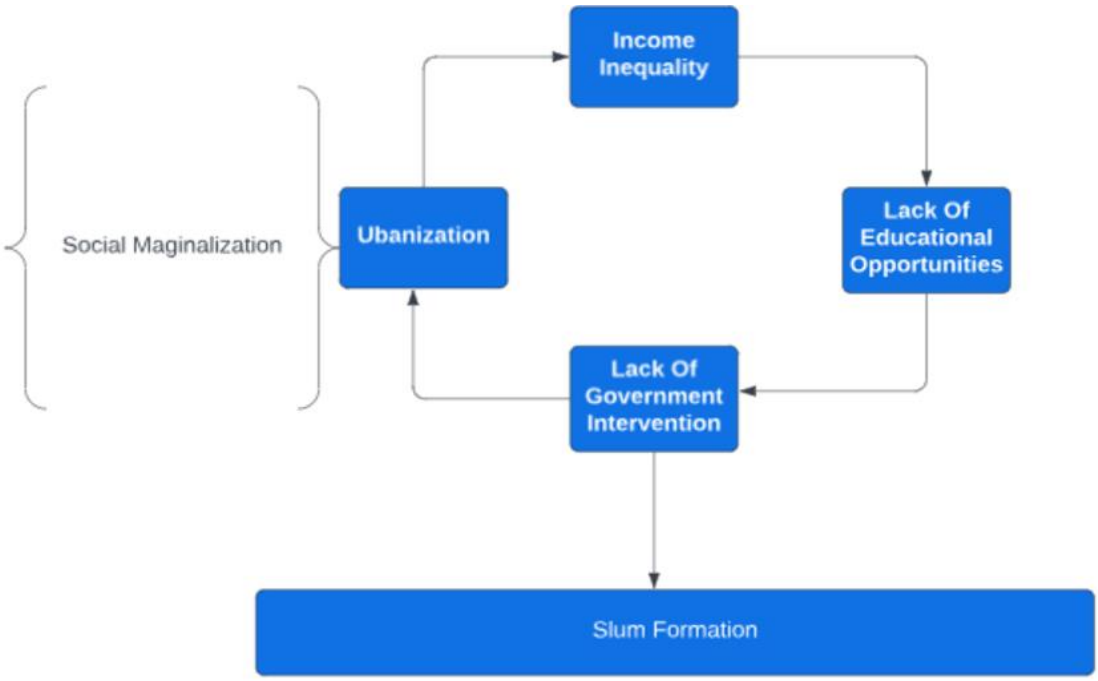

Figure 1: *Lack of Educational Opportunities, Income Inequality and Slum Formation*
Source: Un-Habitat, 2003b - The Challenge of Slums - Global Report on Human Settlements

Background of Makoko

Makoko also referred to as the "Venice of Lagos" is a sprawling waterfront slum community situated below sea level, which results in recurrent flooding issues such as clogged drainage systems. As noted by Squattercity (2007), "Makoko is made up of 98 percent brackish water and 2 percent marshland". The history of Makoko can be traced back to the early 20th century, when

it was founded as a fishing village by the Egun people, an ethnic group that migrated from the neighboring Republic of Benin (Udoma, 2017). The majority of residents residing on land are reported to be Nigerians hailing from various regions of the country (Squattercity, 2007).

Figure 2: *Showing Makoko area on the map. (Source: Google map)*

On the 27th of April 2005, armed police and bulldozers reportedly destroyed 187 housing units, 2 churches, 1 mosque and 1 medical center in the Makoko community (SERAC,2005 in Fika, 2008, p.1), resulting in the displacement of 3,000 individuals. This action not only rendered the residents homeless but also severed their income sources. Protesters who opposed the demolition were met with violence, including beatings, arrests, tear gas, and firearms, leading to numerous injuries (Fika,2008, p.1). Amnesty International (2006) further highlighted that a significant number of those injured were women and children. The government gave grounds for the demolition by claiming that the structure was erected under high tension power (Okulaja, 2013).

The Makoko settlement has been subjected to numerous instances of forced evictions over the past 15 years, resulting in the displacement of more than 300,000 individuals from Makoko, as reported by the Centre of Housing Rights and Evictions (COHRE). These evictions happened quickly, without any prior warning or any form of compensation to those affected. The recurrent evictions in cities like Lagos, Port Harcourt, and Abuja have led to the Nigerian government being recognized as one of the most flagrant violators of housing rights in Africa, according to the AGFE Report for UN-Habitat, 2007. Udoma (2017) notes that, similar to many other ‘slum’ areas, the exact population of Makoko remains unknown due to its lack of formal recognition. She further explained that the World Bank estimates that there are slightly over 85,000 residents in Makoko, whereas ‘The Baale’ (community chief) approximates the population to be about 400,000 individuals within the Makoko community. The settlement lacked essential amenities like schools, healthcare facilities, and access to electricity. According to Okoroafor (2016), the Lagos State government, which had initially marked Makoko for demolition hesitated to proceed with the plan, following the global attention the floating school had gathered. Instead, they approved a “regeneration plan”, with the state’s Ministry of Urban Development utilizing the school's architectural designs as a master plan for upcoming housing projects.

Figure 3: *Showing Makoko women fish traders waiting to buy fish from fishermen. Yasuyoshi Chiba / AFP / Getty Images. Available online: https://theconversation.com/women-fishers-in-makoko-lagoss-floating-slum-are-struggling-as-breadwinners-education-and-funding-would-make-a-difference-218096*

Figure 4: *Showing a drone image of Makoko. Source: CNN. Accessed online: https://edition.cnn.com/2020/02/26/africa/nigeria-makoko-mapping-intl/index.html*

Breakdown of the Makoko Floating School Design

Zeiba (2018) discusses that the original plan was to establish an extension of the Whanniyan School, the only school in the community at that time. The concept was conceived by Isi Etomi, a Lagos native, teacher at Whanyinna school and graduate of architecture from Canterbury University. However, the development of the school extension was still in progress when Kunlé Adeyemi of NLÉ, an Amsterdam-based architecture firm, joined the project to collaborate on the design. The article highlighted that the partnership between the duo encountered some difficulties due to Adeyemi's ambitious vision of constructing a floating school, which Etomi deemed impractical and extravagant, especially considering its inflated budget of $130,000- "seven times more expensive than the Whanniyan School". Consequently, the Stiller Foundation, the primary funder then withdrew its support. Nevertheless, Zeiba (2018) confirms that Adeyemi managed to realize his vision by securing funding from alternative funders such as the "United Nations Development Program (UNDP) and the Heinrich Böll Foundation".

Frearson (2016) documented that the Makoko Floating School was constructed in 2012, by a group of locals using locally grown bamboo and wood waste from a nearby sawmill which was powered by rooftop solar panels and rested on top of 256 plastic drums as designed by Adeyemi and his firm NLÉ. The school was reported to have been completed in the following year. The primary objective of this initiative was to establish and provide a safe, secure and sustainable educational environment for the children of Makoko. Okoraofor (2014) further elaborated that the structure of the floating school was designed to serve two main purposes; (i) as an alternative to the Whanyinna Schoool (which was the only school in Makoko at that time) situated on a land vulnerable to flooding, (ii) a communal meeting place for members of the Makoko community.

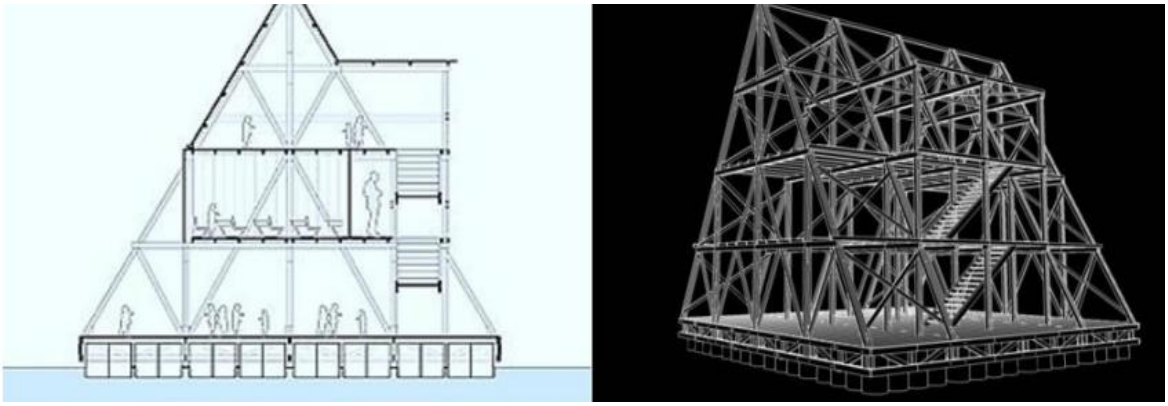

Figure 5*: showing the Structural Configuration of the Makoko Floating School (Source: NLÉ) in Okeke et al., (2019) (Available at: https://isdsnet.com/ijds-v8n8-02.pdf)*

Figure 6: *showing the structural Framework as community gather to test the structure. Captured by NLÉ architects. Available online- https://www.archdaily.com/890330/a-deep-dive-into-the-sad-story-of-the-makoko-floating-school*

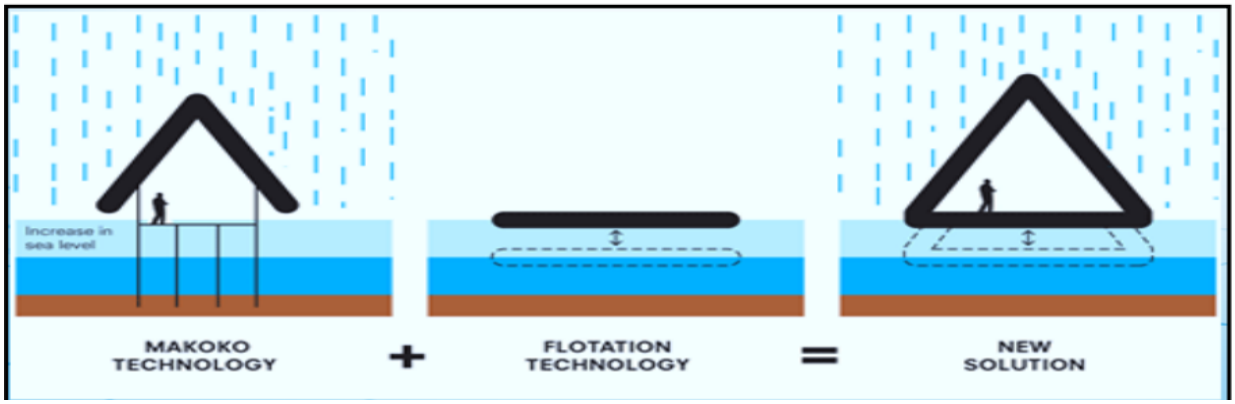

Figure 7: *Design Formula and Concept Diagram. Source: Amy Frearson, Dezeen Magazine (Available online https://www.dezeen.com/2014/03/25/makoko-floating-school-nigeria-nle/)*

Figure 8: *Base of the building during construction of the Floating School. Source: Amy Frearson, Dezeen Magazine. (Available online: https://www.dezeen.com/2014/03/25/makoko-floating-school-nigeria-nle/)*

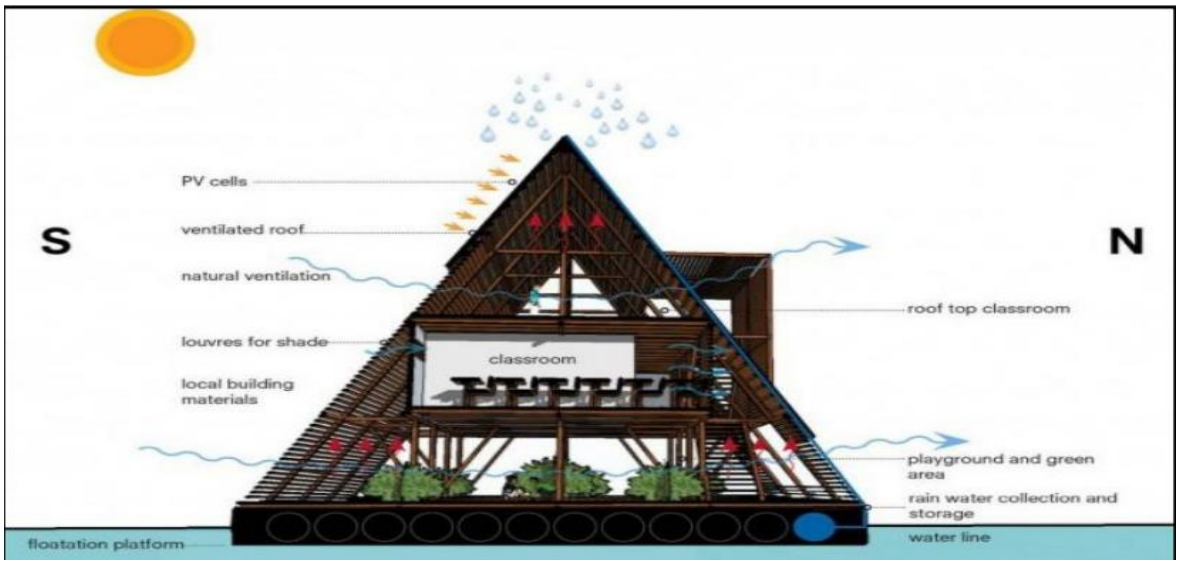

Figure 9: *showing a detailed Cross-Section of the Makoko Floating School Plan. Source: Amy Frearson, Dezeen Magazine. (Available online: https://www.dezeen.com/2014/03/25/makoko-floating-school-nigeria-nle/)*

Figure 10: *showing the Makoko Floating School. Source: Iman Bwan / The ArchDaily. Website. Accessed online: https://www.archdaily.com/563200/how-kunle-adeyemi-engages-the-local-and-specific-to-have-a-powerful-effect-on-a-global-level*

Okoroafor (2016) emphasized that following its completion, the floating school was handed over to Noah Shemede, the headmaster of Whanyinna School, who relocated his pupils from the old school to the newly constructed floating school. The Floating School project garnered numerous awards for its widespread popularity and recognition as a typical illustration of floating architecture, a design style that has gained global recognition (Okoraofor, 2016).

Figure 11: *Showing young students paddling their canoe to school on Feb.29, 2016. Source: Akintunde Akinleye/Reuter, NBC News. Available online: https://www.nbcnews.com/slideshow/nigeria-s-floating-school-gives-hope-poverty-stricken-community-n532326*

Figure 12: *Showing young students getting off a canoe and climbing up a ladder to attend The Floating school on Feb.29, 2016. Source: Akintunde Akinleye/Reuter, NBC News. Available online: https://www.nbcnews.com/slideshow/nigeria-s-floating-school-gives-hope-poverty-stricken-community-n532326*

Figure 13: *Showing a woman who prepares and sells food on a canoe near the school. Source: Akintunde Akinleye/Reuter, NBC News. Available online: https://www.nbcnews.com/slideshow/nigeria-s-floating-school-gives-hope-poverty-stricken-community-n532326*

What Went Wrong?

Despite receiving international recognition for its determination and humanitarian efforts, the Makoko Floating School operated classes for four months during its three-year lifespan (Leardi, 2018). According to Fairs (2016), the unfortunate incident occurred on June 7, 2016, when the Makoko Floating School collapsed due to heavy rainfall. A community leader had verified that there was no casualty, as the students had been evacuated from the school's premises for safety reasons. The collapse was attributed to a combination of factors, including poor maintenance, inadequate supervision during construction, and the challenging environmental conditions in which the structure was situated.

He further reported that prior to the collapse, concerns were raised by residents of the Makoko community regarding the stability and safety of the Floating School. Shemede, the headmaster of the Whannigan school who had taken charge of the Floating School, expressed doubts about the structural solidity of the building and its ability to withstand extreme weather conditions (Fairs, 2016). These apprehensions conflicted with the statements made by NLÉ, Adeyemi's architecture company, who asserted that the Makoko Floating School was dismantled after three years of active use for renovation and reconstruction purposes, with plans for a newer version underway. According to Zeiba (2018), the Makoko residents and other observers viewed the school as a mere "vanity project".

Based on my analysis and perspective, the utilization of inferior and substandard materials, may have significantly contributed to the sudden destruction of the floating school. Adeyemi's NLÉ firm had already secured funding from international donors, while the local community was entrusted with the project construction, providing part-time employment opportunities for the community members during the construction stage. It is possible that substandard building materials might have been purchased by local community leaders or individuals assigned to the task.

To support my claim, a comparative analysis between the original floating school structure and its newer versions shows a clear misuse of funds and significant discrepancy in the quality of building materials used. The floating school construction likely involved usage of low-quality materials which I believed compromised the structural integrity of the building which ultimately led to the catastrophic failure of the Makoko Floating School, highlighting the critical importance of proper resource allocation and adherence to quality standards in architectural projects.

Figure 14: *shows the Makoko Floating School design side-by-side another different version - MFS IIIx3, 2018 in Jincheng Lake, Chengdu China. Source: Public Delivery Website. Accessed online: https://publicdelivery.org/makoko-floating-school/*

Additionally, if the project has been properly monitored and supervised by the project manager, Adeyemi of NLÉ, a stronger building could have been erected, potentially averting issues of corruption and financial mismanagement. Gaestel recounted his discussions with community leaders who expressed feelings of being "sidelined" and viewed the project as a personal endeavor ever since its transfer to Shemede (Whannigan School headmaster). He also verified that the Lagos state government did not endorse the structure and considered it an unauthorized construction (Gaestel, 2016).

Figure 15: *shows a local man looking at the buoyant school construction collapse following a heavy rainfall in Lagos. Photography by Allyn Gaestel. The Atavist Magazine. Accessed online: https://magazine.atavist.com/things-fall-apart-makoko-floating-school/*

The incident involving the Makoko Floating School underscored the critical importance of meticulous planning, constant monitoring and consistent maintenance in architectural works, particularly within a community like Makoko. The occurrence serves as a reminder of the necessity for innovative and great solutions that puts into consideration the challenges faced by residents of slums. The Habitat III framework offers a holistic approach to tackling issues related to housing and urban development, with strong emphasis on sustainability and inclusivity. By incorporating the insights learned from the Makoko Floating School incident, architects and urban planners can conceptualize more durable and sustainable projects, ensuring responsible resource management while striving to enhance the quality of life of individuals residing in vulnerable communities.

Successes:

The Floating school gathered international attention for its innovative approach to addressing educational challenges in a flood-prone area like Makoko (Leardi, 2018), particularly in improving access to education for children growing up in slums. The initiative not only highlighted the potential of innovative solutions in overcoming such obstacles but also emphasized the importance of community engagement and participation in the education system. By serving as a community project, the Makoko Floating School created a sense of ownership amongst residents, further enhancing the impact of the educational intervention.

Actors involved in the Floating School Initiative

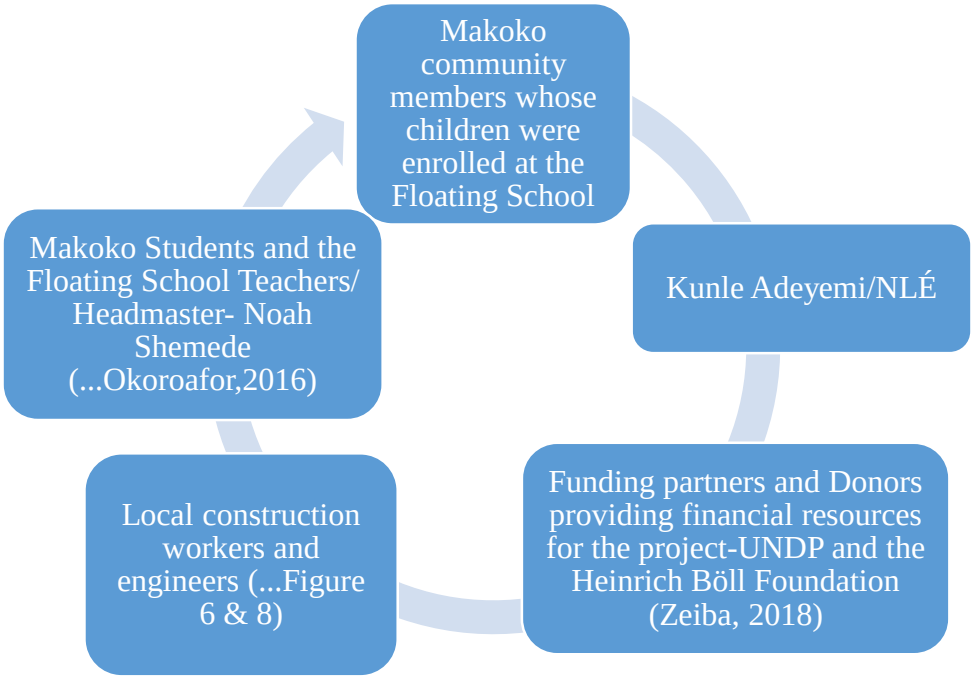

Figure 16: *The diagram above illustrates several actors who had played key roles in the development and operation of the Makoko Floating school.*

Outcome of the Initiative

While the school gathered international attention for its innovative approach to sustainable architecture and its potential impact on slum upgrading initiatives worldwide, the Makoko Floating School Initiative can be considered a mixed success with both positive and negative aspects to consider. While the concept itself was innovative and addressed a critical need for education in vulnerable communities, there were challenges and limitations that affected its overall effectiveness. Below, is a critical assessment of the initiative:

Beneficiaries of the Floating school initiative

- Households whose children were enrolled at the Floating School.
- The Architect and his architectural firm: As a result of the floating school design, Adeyemi's NLÉ firm gained international recognition due to its unique architectural concept and vision in creating a distinctive learning environment (Leardi, 2018).
- The students who attended classes at the Floating School.
- Food vendors: For example, the woman selling food from her boat near the school was able to generate sales and income, while the school was in operation, as she catered for the needs of the students and teachers during school hours.
- Local vendors in the Makoko community who were patronized during the construction, which would help boost the local economy.
- Local artisans such as the carpenters, bricklayers, engineers etc who played a crucial role in the construction process of the project, offering their skills and expertise to bring the Floating School to reality (Frearson, 2016).
- The Community Members: The collective efforts of community members brought attention and led to international recognition of the Makoko community as a whole (Okoroafor, 2016).

Losers from the Initiative

- Students who may have been unable to access or pursue their education due to the closure of the school.
- Food vendors: The closure of the school could have caused a decrease in sales for food vendors who were operating from boat near the school premises (as shown in Figure 13)
- International donors: such as UNDP and the Heinrich Böll Foundation who were involved in supporting the initiative (Zeiba, 2018).

Methods utilized in the initiative (Frugal Innovative Theory)

The frugal innovative theory was exemplified through the use of local materials and traditional building techniques (as illustrated in Figure 8). Furthermore, Adeyemi's engagement and partnership with the local community was crucial during the construction process (as depicted in Figure 6)

Future recommendations for enhancing educational facilities in slum upgrading initiatives

Prior to initiating forthcoming projects, I believe that it is imperative to conduct a comprehensive needs assessment and a clear feasibility study to prevent a recurrence of the Makoko Floating School incidence. The sustainability of each project in the long term is crucial and should be prioritized from the onset, taking into account long-term maintenance requirements. It is essential to integrate effective monitoring and evaluation mechanisms to periodically track the project's progress, as emphasized by Adeyemi's NLÉ architecture firm. The Floating School is regarded as a community project that should be handled and managed by the Makoko community and not neglected (Zeiba, 2018). Establishing robust collaboration and holding regular meetings with local stakeholders such as community leaders, teachers, parents of the students, vigilante and local security personnel can instill a sense of ownership among locals and encourage them to safeguard the structure as if it were their own.

While the concept of the floating school was indeed an innovative idea, I recommend that future projects focus on utilizing high-quality and durable materials during construction. Additionally, adopting the principles of Frugal innovation, which emphasizes on the creation of long-lasting and sustainable projects at minimal cost. Furthermore, it is essential to prioritize providing quality education by understanding and addressing the needs of both the teachers and students. This involves the provision of educational supplies such as notebooks, textbooks, crayons, chalks, school uniforms, shoes, pencils, blackboards and school bags for students. These resources enable students to actively participate in the learning process by providing them with the necessary tools for writing, drawing and note-taking, thereby giving equal opportunity for them to succeed academically. Constantly monitoring and evaluating the teachers in slum settlements is very essential to maintain the quality of education being delivered. Providing training sessions for these teachers, would help enhance their teaching skills, giving room for up-to-date innovations with the latest teaching methods.

Conclusion

While the Makoko Floating School initiative stands out as a noteworthy contribution to the conversation on slum upgrading and informal settlement development due to its innovative and functional design that addresses the fundamental needs of slum dwellers, such as education and schooling, it also encountered various challenges that affected its success. By critically examining both the positive and negative aspects of the initiative, future initiatives can gain valuable insights into improving and enhancing educational opportunities in slums. However, in order for urban and local development to progress, it is imperative that slums undergo continuous upgrades. Government should provide assistance to local leaders in their efforts to modernize and implement sustainable projects aimed at enhancing the social welfare of individuals living in and around slums. The Makoko Floating school project highlights how architecture can be leveraged to drive positive transformations within urban settlements.

Word count: 3737

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