

Avoiding the Imperialist Agenda when Designing for the Developing World

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ABSTRACT: *Overly technical modes of sustainable development can reinforce power dynamics implicit in imperialism. In response, this research explores a low-tech, accessible approach to sustainable innovation in developing regions, working at the material scale, so that local can control their own spatial and aesthetic autonomy. This paper will share the results from a review of public health, building science, and architectural literature exploring the role that unintentionally imperialist pedagogies play as tools for western exploitation in developing regions. Building off of this evidence base, this paper will close with examples of anti-imperialist workflows in architectural education, exploring the synergies between public health, material science, and design. These student-led innovations suggest opportunities for developing novel partnerships that integrate topics that tend to be studied separately and leverage the imperative to respond to the health effects of climate change with methods that advance human health and equity concurrently.*

KEYWORDS: Pedagogy, sustainability, anti-imperialism, developing countries, rural Africa.

INTRODUCTION

The effects of a rapidly changing climate are disproportionately impacting regions based on both climate and economic status. Studies indicate that climate change impacts will dramatically increase vulnerabilities in rural communities where those living off the land are at increasing risk from extreme weather events such as heat waves, famine and drought. In fact, it is expected that a 2°C-temperature rise would reduce world GDP by 1% globally (Stern 2007), but would cause a disproportionate 4-5% decrease in developing countries (Bierbaum and Zoellick 2009). According to the United Nations, the most significant population growth is expected to occur in tropical regions of Asia and Africa (Hoekstra and Molnar 2010), which have historically lagged in wealth and resources (Sachs 2001). Compounding the issue, more than 80% of the world is at risk from at least one mosquito-borne disease, and malaria is a leading cause of death in the developing world (WHO). However, most research in this field addresses this public health crisis in the form of pesticides, chemical interventions and genetically modified mosquitos with little consideration for the role of the built environment, particularly in limited resource settings. While this phenomenon presents a unique opportunity for the overlap between architecture and public health, this paper explores a pedagogical approach to housing, health, and environmental design in rural Africa while trying to avoid an imperialist agenda.

1. BACKGROUND

Development is a crucial facet of a region's economic, social, and political growth, but most importantly for individual human growth. According to United Nations Development Program's (UNDP) annual Human Development Report (HDR), human development is defined as, "expansion of people's freedoms to live long, healthy and creative lives; to advance other goals they have reason to value; and to engage actively in shaping development equitably and sustainably on a shared planet" (United Nations 2022). Implicit in this definition is the capacity to make personal democratic choices. However, development of certain regions often involves substantial support from industrialized, wealthy countries. Despite best intentions, this support can operate as a means of political, social, cultural, economic, and educational influence (Browne 2006; Xue et al. 2019). Though this aid can be benign, there is often a hidden agenda rooted in imperialism that creates trust issues and inhibits developmental autonomy in a region.

In order to reduce opposition from local people and foster development it is important to inculcate public engagement (Devine-Wright 2011). Conflicts and opposition can arise from feelings of powerlessness and lack of transparency on the decision-making process (Sturzaker and Verdini 2017). For this reason, public engagement becomes crucial to gain trust for smoother execution of development projects.

The local communities thus fear these encroaching forces that try to colonize the world under the name of "development". In the post colonialist world, with globalization, developing countries like China and India have been faced with internationalization (Chang 2010). Urbanization in India, for example, is heavily influenced by modern ideologies due to influence from the Western architects. The architecture is more global than local

and the developing countries like India struggle to keep up with the rapid pace of globalization. While this phenomenon is often most evident at the large scale of urban development, it is also a condition that we must be acutely aware of as we design from outside, from a position of privilege and power.

1.1 Technology & Imperialism

The technology-centric approach to urban development as the dominant model of innovation in industrialized countries has led to expansive ecological degradation and exclusion from sustainable technologies in low-resource settings. At an international economic policy meeting in 1995, Thabo Mbeki, the vice president of South Africa, told world leaders that the majority of the world's population had yet to make their first telephone call (Braa 1996), despite its invention over 100 years prior. Meanwhile, millions of Americans already had personal computers in their homes. With such a significant gap between first and third-world countries, developers often expect local communities to appreciate high-tech solutions. However, as buildings become more technologically complex, users must rely on professionals with specialized knowledge to design, manufacture and manage these increasingly complex environments. Instead, simple, accessible strategies should take the place of overly sophisticated and mechanically-driven designs to make high performance building design accessible to those with the greatest need.

Though there is an increasing emphasis on user-centered design methodologies in practice, this approach is often top-down, meaning that the process is driven by 'experts' and end-users have little opportunity for involvement in the innovation process. However, a truly bottom-up approach would recognize different forms of knowledge to democratize the innovation process, allowing end users to also become innovators. The maker movement, for example, has been cited as 'the new Industrial Revolution' (Anderson 2012) for its ability to foster bottom-up design to productively disrupt mainstream innovation systems dominated by disciplinary experts and open the door to a new era of participatory design and sustainable consumption (Davies 2003). What is needed is not high-tech, but "appropriate" technology that merges traditional knowledge with advanced technologies that can be controlled and maintained by the local communities (Murphy et al. 2009). It is clear that high-tech modes of sustainable development reinforce the power dynamics implicit in imperialism. In response, this research explores a low-tech, accessible approach to sustainable innovation in developing regions, working at the material scale so that local residents can have control their spatial and aesthetic autonomy.

1.2 Architectural Education

Within early level architectural design education, work flows are tending toward digital means (Özkar 2007) and media-driven, production-based representation (Canizaro 2012) as well as emphasis on technological competence (Cheung 2012). However, this global trend in education appears to neglect the transfer of experiential knowledge and indigenous practices that seek to address similar issues in an analog way. Instead, institutional models are becoming more like mature enterprises in the business world where capital and influence are dominating the primary idea of literacy and growth (Christensen and Eyring 2011). Globally, higher education often reflects a shift from public good to private profit. On one hand, it promotes information globalization and education equity while on other hand it may be discerned as an instrument that perpetuates colonization related to profit generation, reliance on market transactions, and power related to discourse (Reyes and Segal 2019).

Decolonizing education is not just about supporting indigenous people and decolonizing aboriginal education, it is about changing the whole education system to make it more accepting to worldviews and nourishing the common agenda of learning. It is about rethinking the curriculum, rejecting Western pedagogy as normative, and adopting new ways of knowledge production, transfer and intake. Changing direction is required for achieving these larger goals. Student led initiatives and academic involvement in research need to be promoted to achieve educational development. Internationalization and colonization have had tremendous impacts on regional educational systems as well. Countries often tend to analyze their own education systems and draw flaws and deficits in them. What decides that, is the spirit behind exercising the change. To imitate western countries and their high-tech systems, developing countries often neglect the merits of their own resources and indigenous practices. Colonization by western education pedagogies can be further demonstrated by the following cases:

The case of Africa: "Africanisation" is a process that called for including African perspectives into the post colonized African world that was influenced by European colonization (Makgoba 1997).

The case of Hong Kong: Higher Education Policies in Hong Kong have been influenced by market ideologies and three major sections of education: teaching research and management have been influenced by the global wave of "corporate managerialism" (Mok and Lee 2000).

The case of Korea: The civil exam system that was existing in pre-colonial Korea was reformed after being colonized by Japan in 1910 and focus shifted to expanding the use of Japanese language in schools (Hong and Paik 2018).

The case of Canada: The impacts of colonization of educational institutions in Canada can be seen in residential schooling. The current Canadian education system favors ethnocentric ideologies and Eurocentric frameworks that marginalizes indigenous Canadian people (Semple 2020).

The case of India and Nigeria: In early 1900 school children in India and Nigeria were reading English literature as a result of British colonial rule (Elder 1971).

Architectural education has also been a subject to colonialism. The architectural pedagogical approaches are the ones that have a direct impact on the students and the architectural values that they adopt. In Africa students were treated as 'blank slates' that were subjected to approaches from European or North America, disregarding their previous individual life experiences (Olweny 2020). In Northern Canada colonization in architecture education is evident by the Euro-Western practices adopted over indigenous human centric approaches (Semple 2020). While these may seem like obvious examples, the notion of imperialism permeates many aspects of the education experience.

Architecture is a distinct, creative field that overlaps with various other disciplines like art, science, dance, etc. The pedagogical approaches must therefore focus on balancing student design and socio-behavioral aspects. In other words, the curriculum should be structured to make the students better designers as well as better global citizens. The curriculum of architectural education needs an overall reformation which rejects the colonial adulterated practices that are not applicable in that given regional setting and promotes indigenous methods that serve the environment and culture of that region. Architectural education must be cross disciplinary in order for the students to have a holistic knowledge of the human aspects of architecture and not just the technical realities of construction. There is a lot to learn beyond the four walls of the classrooms, may it be architecture or any other discipline. This paper will address the way that the use of design thinking in material science can be used as a tool to support developing communities while avoiding the imperialist pedagogies.

2. METHODS

This next section will describe a graduate level topical (elective) design studio offered by the University of North Carolina at Charlotte School of Architecture in the Fall of 2021.

2.1 Protective Atmospheres

Indoor air can build up high levels of moisture, disease, odor, gases, dust and other respiratory contaminants which can more easily dissipate in fully-outdoor conditions. Though contaminants can be mitigated by advanced mechanical systems, this is typically supported by the consumption of fossil-fuels to provide an air quality that is still inferior to outdoor air. Though a building with 'breathable' qualities may alleviate some of the respiratory concerns and reduce energy consumption, it is no silver bullet. In fact, breathable buildings present their own set of issues, particularly in tropical regions with a high prevalence of vector-borne diseases. This research studio addressed the tremendous need for low-cost, accessible domiciles that are culturally responsive, thermally comfortable and exhibit a high level of functionality from the standpoint of respiratory and vector-borne disease prevention.

Recent efforts to make a house more "protective" from vector-borne diseases often lead to dwellings that have reduced air transmission and provide substandard air quality and interior comfort. In response, this course linked human comfort and mosquito protection as part of a singular design proposition, dispelling the notion that protective, low-energy and comfortable buildings must be sealed, airtight enclosures that isolate the occupant from the outdoors and much of the social life of the community that occurs there.

Because the project site was located in rural Tanzania, a region that not a single student in the class had been to, we had to be particularly cautious of an imperialist approach to design. Additionally, residents are often skeptical of substantial interventions to their built environment, particularly those that affect their housing. Despite best intentions, outside developers often rely on the regional aesthetic, while overtly vernacular styles may reinstate stigmas of poverty in communities that seek modern buildings. In preliminary research, we found that Tanzanian residents would prefer to live in modern brick houses (that may take many years to build), rather than 'cheap' but fully protected wooden homes. While this project actively pursued solutions to address human health, energy consumption and constructability, we were also sensitive to the needs of the community. In response, this project built on the notion of public interest design and the role of community members as

local experts and critical decision makers, demanding a strong service component to be addressed through multidisciplinary collaboration and shareholder involvement.

2.2 The Humble Brick

Though many modern buildings can be high-tech and mechanically complex, rural communities often have limited resources for building materials. The brick is the most used building material in the world – in fact, one third of the world’s population lives in buildings which are totally or partially made from earth (Barnaure et al. 2021). In addition to its low cost and accessibility, earthen construction has significant performative qualities, including thermal, fire and insect resistance, durability and low maintenance as well as its ability for reuse and recycling. By studying the material aspects in tandem with the synergistic relationships of heat, energy, emissions, water, information and resources that make up a city’s public services, this humble building material has the potential to become a greater part of the urban resiliency strategy, while also limiting biases toward from Western influence. Architecture students designed innovative ways to reconceive modular materials that challenge existing norms of construction, thermal comfort and vector control.

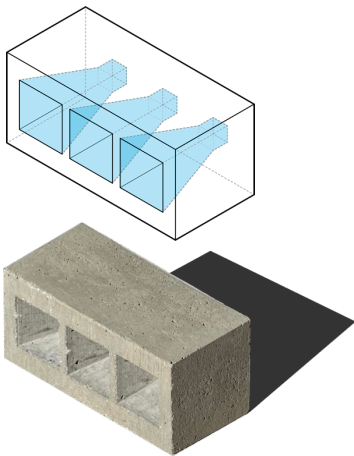


Figure 1: 'Venturi Block' by Nathan Smith, 2021.

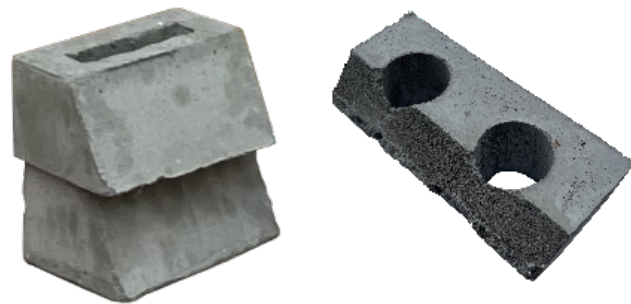


Figure 2: (left) 'Porotherm Block' by Vamsi Kamatham, 2021 (right) 'Water Collecting' by Sarika Merchant, 2021

Shown in Figure 1, Nathan Smith developed the 'Venturi Block', which used the principles of the venturi effect to create a cooling effect while also increasing airflow to a level that is difficult for mosquitos to fly. Shown in Figure 2, Vamsi Kamatham and Sarika Merchant designed blocks with vertical cavities to move air and water respectively. The students were encouraged to work in concrete and at full scale to replicate real-world conditions. Using the principles learned at the material scale (the block), combined with the site research from the beginning of the semester, students developed strategies for protective housing in rural Tanzania using the parti diagram from their blocks to translate the design principles from the material scale to the scale of the domicile, community or infrastructure. Students considered their modules as a 'system', which was prepared for a common purpose and described a set of rules and organizational strategies. Students continued exploring the material, constructability, and thermal performance qualities of the blocks / modular units at the domestic scale. Students also explored (in detail) how the building came together as well as how it behaves to keep occupants thermally comfortable and protected from mosquitoes. However, students were never asked to lay out particular spaces beyond the major functions of cooking and sleeping to avoid Western bias. Instead, students were most concerned with the constructability and tectonic innovations inspired by their block strategy. Students were asked to establish a clear direction for the kind of protective atmospheres that addressed critical principles of thermal comfort, protection from mosquitoes and resilience in a changing climate. This, of course, is difficult to capture in measured drawings. Therefore, other forms of visualization were needed in order to convey their approach to place-making, in articulating an authentic sense of place, and in providing the residents of Ifakara (or other rural Tanzanian communities) with a sense of refuge. Prototypical designs addressed several needs, including the ability to:

1. protect from mosquitos and other public health risks;
2. provide thermally comfortable environments without access to energy;
3. leverage existing skills while adding innovative methods and techniques;
4. increase resilience to economic and ecological challenges.

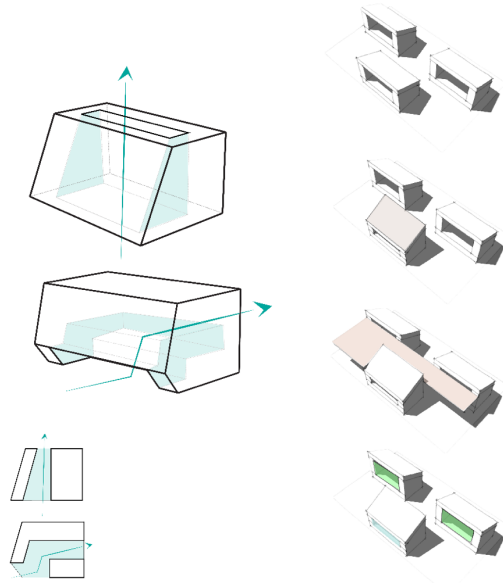


Figure 3: Schematic diagrams by Vamsi Kamatham, 2021



Figure 4: Interior (top) and exterior (bottom) renderings by Vamsi Kamatham, 2021

According to graduate student Vamsi Krishna Kamatham, whose project is shown in Figures 3 and 4, the term 'porotherm' was used to describe its porosity and desired thermal characteristics. The primary objective was to provide air movement through the brick system, while also achieving a certain level of privacy so that it can be used as external wall system. The main idea is to accommodate the all three key features: to promote air circulation through the brick, to protect the wall system from sun (i.e., minimizing solar heat transfer through conduction, convection, and radiation), and thirdly to accommodate a certain level of privacy (i.e., privacy protected jali screen). The angular face is used to protect the brick from climatic and privacy point of views. A recess is provided underneath to let the brick breathe and have a continuous flow of air, so that thermal comfort is achieved. In scaling the ideas of the module to the full house design, Kamatham utilized three primary keywords: collecting, connecting, and regulating. Similarly, the house layout was composed of three individual units with the concept of incremental development. The form of the individual units was inspired from actual brick geometry and properties. The individual units were arranged in a way to take the advantage of prevailing wind. The middle unit (gathering space) is emphasized, so that the maximum wind movement is created by framing the wind with the help of other two units. The corridor space acts as connector, which binds all three units together and the middle block further opens to the corridor space by creating a transition zone, which is peri-domestic in nature.



Figure 5: Exterior Rendering by Matt Panko, 2021



Figure 6: Interior Rendering by Matt Panko, 2021

Similar to Smith's 'Venturi Block' shown above, graduate student Matt Panko worked under the assumption that mosquitos have difficulty flying at increased levels of air speed, shown in Figures 5 and 6 above. However, Panko didn't actually utilize a novel block design, instead manipulating the stack pattern to increase air flow from cross ventilation but maintaining the structural integrity of the masonry wall. His project served to improve thermal comfort and reduce mosquito intrusion by increasing air flow. The central living air is more open, with a solar-powered ceiling fan, and the perimeter sleeping rooms are more enclosed and protective from mosquitoes which are more likely to bite at night.

CONCLUSION

While focused on one country terribly afflicted by mosquito-borne disease, the intention was that strategies embedded in the initial and subsequent prototype designs would be translatable to other communities in developing, tropical climates. Through interdisciplinary research, design and fabrication processes, students explored ecological, cultural, and thermodynamic issues that frame modern housing typologies in rural Tanzania. Particular emphasis was paid to sophisticated and thoughtful applications of conventional construction techniques and affordable, low-tech building materials as opposed to building layout, which would be overly subject to Western influence. By working at the material scale (the block), we believe that this approach is a way to serve those most in need without inflicting one's own views and reinstating an imperialist agenda.

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