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Sustainability at a Distance: Design for the Open University of West Africa

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ABSTRACT: Most contemporary notions of sustainability note the need for an intimate knowledge of place for projects to fulfill their ecological potential (Mang and Reed, 2012, Van der Ryn and Cowan 1996, Orr 1992, Mang, 2001). This desire can be at odds with the current mode of global practice that characterizes the professions of architecture and landscape architecture. Western design firms taking on projects in the Global South often must proceed with limited information about site and context. This paper provides a description of one such project in an academic setting in order to propose a set of working guidelines and provisional lessons learned that could guide Western architecture and landscape architecture schools seeking to implement sustainable design solutions at a distance in Africa and elsewhere in the Global South.

Conference Theme: Education for Sustainability
Keywords: environmental and economic sustainability, passive design, timbrel vaulting, compressive form,, stormwater management, earth construction, compressed earth blocks, site aggregates, landscape design.

1.0 INTRODUCTION

Most contemporary notions of sustainability note the need for an intimate knowledge of place for projects to fulfill their ecological potential (Mang and Reed, 2012, Van der Ryn and Cowan, 1996, Orr, 1992, Mang, 2001). This desire can be at odds with the current mode of global practice that characterizes the professions of architecture and landscape architecture. The combination of distant project sites, compressed project schedules, and limited budgets often result in projects moving ahead with an incomplete knowledge of site, whether considered from the standpoint of detailed analysis of micro-climates, or relevant cultural fabric. Western design firms taking on projects located in the Global South are especially susceptible to a lack of information about sites due to a lack of availability of general data, and the difficulty traveling to remote sites to conduct thorough site analysis. This paper provides a description of one such project in an academic setting in order to propose a set of working guidelines and provisional lessons learned that could guide Western architecture and landscape architecture schools seeking to implement sustainable design solutions at a distance in Africa and elsewhere in the Global South.

2.0 BACKGROUND AND CONTEXT

The project described in the paper is a graduate-level design studio taught by the authors in Fall 2011 at the School of Architecture and Landscape Architecture at the University of British Columbia. The students in the studio developed conceptual design proposals for the Open University of West Africa, a real project currently in development by Heal the World, a Non-Governmental Organization (NGO) with prior experience establishing educational programs in West Africa. The Open University of West Africa aims to create a fully accredited online university utilizing open courseware and social media to increase educational and economic opportunities for students across West Africa. Primary course delivery is via the Internet, using educational components that build on asynchronous interactive online courses developed at MIT, Carnegie Mellon, and the Open University UK (Young, 2005). The design studio at the University of British Columbia took on the design of the physical campus, which is to be constructed on twelve hectares of donated land sixteen kilometers south of the capital city of Ouagadougou, Burkina Faso with Internet portals to be built throughout West Africa as the project reaches scale. The close alignment of the collaborative design studio with a real international project offered unique pedagogical and contextual design opportunities. The conceptual designs of the studio were provided to Heal the World for use in project fund raising and to guide future development concepts, and there is an ambition to use the most refined designs as points of departure as the project moves forward. In the future, several students involved in

the studio will travel to Ouagadougou, Burkina Faso to participate in the construction of the first buildings on the site of the new university grounds. Designing the central campus of an innovative-networked university in one of the poorest and most rapidly developing regions of the world provided students with an opportunity to engage with the difficult task of developing sustainable designs at a distance from a project site in a radically different context in the Global South.

3.0 OPEN UNIVERSITY OF WEST AFRICA DESIGN STUDIO

During the design studio, twenty-four architecture and landscape architecture students collaborated to develop sustainable master plans, building designs, and Internet access points for the proposed university.

Figure 1: Site and precedent analysis
Source: left Cindy Hung and Josimar Dominguez; right Andrew Neumann and Niall Fergusen, Open University of West Africa Studio, 2012

3.1 Design studio description and methodology

The studio was divided into three phases. During the first phase, students worked in interdisciplinary teams of two (one architect with one landscape architect) to research relevant architectural precedents and conduct comprehensive site analyses from print and online sources. These sources were augmented by data collected by one of the instructors, who spent ten days on the site in the summer prior to the studio. The results of the Phase I research were documented in a book (Fig. 1). During the Phase II, the same teams developed either a master plan, a detailed design of an individual buildings and landscape on the campus, or a prototype for a remote Internet access portal. Students conducted independent research on construction methodologies utilizing appropriate technologies together with local materials and labor. During Phase III, which took place in the final three weeks of the studio, the students and instructors analyzed the team projects and grouped them according to similarities. These individual projects were integrated to produce three comprehensive visions for the Open University of West Africa.

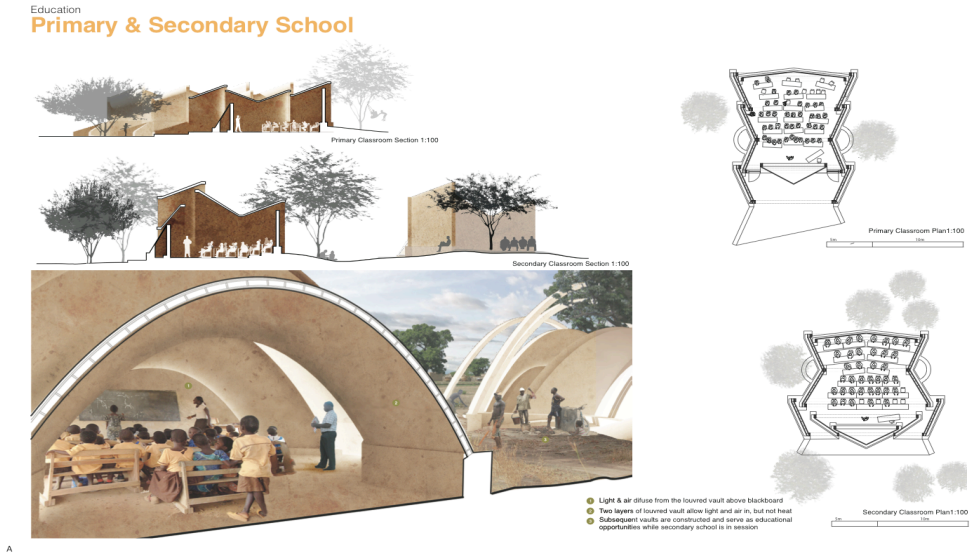

Figure 2: Design proposal for classroom building
Source: Austin Hawkins, Ania Duran, Open University of West Africa Studio, 2012

3.2 Design studio objectives

Although the proposals produced by the students were provided to the client, the studio was exploratory rather than instrumental, questioning core assumptions about sustainability in the context of social and economic circumstances unique to Burkina Faso, and accommodating a wide range of approaches. Special attention was paid to design and construction methods capable of meeting the unique challenges of the social, economic, and climatic contexts using materials and expertise native to the region. In particular, the instructors emphasized the need for holistic sustainable designs capable of utilizing passive building and landscape technology in conjunction with locally available natural construction materials, and comprehensive plans for water conservation and storm water management. Students were encourages to explore the use of thin-shelled compressive vaulted structures constructed from compressed earth tiles fabricated from site soils and the structural analysis methods pertaining to them (Fig. 2) due to their promise on a similar project recently completed in South Africa (Ramage et al, 2010). Students generally were encouraged to envision affordable design and constructible solutions, maintainable over time and within the financial means locally available.

Figure 3: Open University of West Africa master plan
Source: Sophie Macneil and Jessica Gingell, Open University of West Africa Studio, 2012

3.3 Design Proposals for the Open University of West Africa

Each of the three comprehensive design proposals for the Open University of West Africa developed in the studio included an overall conceptual orientation, a master plan that encompassed buildings and landscapes (Fig. 3), design for individual classroom buildings, and an Internet portal. All of the proposals extended considerably beyond the initial project brief to include spaces intended to connect the Open University of West Africa to the local community in which it is to be situated by offering spaces to be used for community gatherings and commerce by the local community. The individual proposals are described below.

Community Catalyst

The Community Catalyst proposal increased the scope of the Open University of West Africa to include a physical presence that promotes sustainable agriculture and economic opportunity at both local and global scales. The group creates spaces to promote the local processing of these resources, adding value to export goods. The architecture proposed by the Community Catalyst group reflects these interests, offering spaces where these materials could be cultivated and processed to add value

locally, and community members can access information about global markets to ensure that they are offered the highest prices for their products.

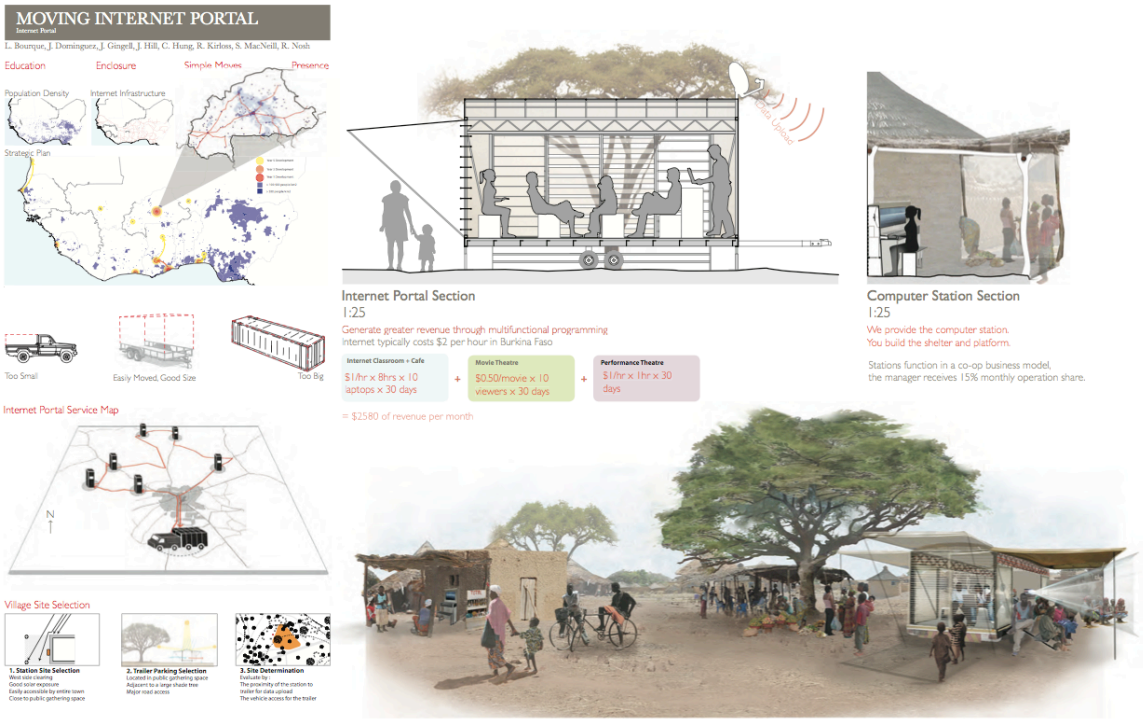

Figure 4: Design proposal for mobile Internet portal
Source: Josimar Dominguez and Cindy Hung, Open University of West Africa Studio, 2012

Spaces Between

The Spaces Between proposal focused on the interstitial spaces generated by the proximity of buildings and their interaction with the landscape. The phased master plan was conceived of as three nodes that are developed incrementally as the university grows to capacity. Each node provided for a zone of activity, combining mixed use classroom-dorm buildings with an assembly building containing an Internet portal through which classes are accessed. Interstitial spaces are created by the proximity of buildings and their interaction with landscape, allowing for varied outdoor occupation. Vaulted masonry structures are integrated into the landscape, housing classrooms and dormitories. The Spaces Between group maximizes access to the Internet by mounting the Internet portal on a standard truck trailer that travels through local communities on a prescribed circuit (Fig. 4) The roving Internet portal connects to the communal building altering the program with the Internet and media opportunities it brings while providing physical manifestation of the virtual web that connects the university to the rest of the world.

Social Networks

The third group developed community through methods of knowledge transfer and skills acquisition. The group observes that in West Africa, education generally targets rote knowledge transfer rather than addressing more relevant societal and communal needs. Motivated by the desire to strengthen community ties, the proposal organizes space and learning to maximize physical interaction and to connect students to their immediate communities, suggesting that strong social connections to local communities will create a sense of belonging and place that will inspire students to invest their talents and skills in West Africa, improving the condition of their region and countries.

4.0 DISCUSSION

The three comprehensive designs produced were motivated by a strong desire by the student teams to develop ecologically responsive design solutions capable of bringing positive change to West Africa while respecting local context and tradition. Generally speaking, the strengths and weaknesses of the proposals are outlined below:

Common Strengths

- Provided client with fresh visions of possible architectural and landscape architectural forms of the University campus
- Attempted to deal sensitively with local context and tradition
- Utilized locally available materials and labor
- Optimistic about the potential of architecture to address social issues in West Africa
- Common Weaknesses
- Designs limited in imagination and scope owing to desire to work with exclusively local materials accompanied by a lack of detailed knowledge about local context
- Optimism about what architecture might be able to accomplish bordering on idealism and unrealistic about the possible outcomes
- Designs were sometimes didactic, attempting to “solve” problems of region or “teach” inhabitants through architecture

All of the proposals were characterized by a profound respect for the local context and environmental conditions. However, a lack of reliable information about the local microclimates and context made this approach deeply problematic. The desire to operate in a contextually sensitive way while lacking the intricate knowledge required to do so in a rigorous way resulted at best in well-meaning attempts to operate in a kind of imagined vernacular. In one case, this resulted in buildings that attempted to evoke a kind of “African” village structure using traditional materials and methods, in which the logic that dictated the placement of the buildings next to one another was unidentifiable. This well-meaning but misguided attempt to design from a “native” perspective is the worst of both worlds: operating at a cultural and physical distance from the site so great as to render any real understanding of cultural difference negligible, such schemes achieve little more than an unintended parody of very traditional African village structures that it attempts to respect.

4.1 Challenges

The demands placed on the students in the Open University of West Africa studio exceeded the demands of an ordinary studio, presenting the students and instructors with multiple challenges. The studio required students to work collaboratively in an unfamiliar context to produce coherent schemes covering an ambitious array of scales. In addition, students were expected to complete a range of additional calculations and considerations on issues such as rainwater capture, energy generation, and sanitary systems. The former concerns could be effectively addressed through a more considered phasing of the studio work (e.g. master planning exercises, followed by design of individual buildings), rather than simultaneous development at all scales, which led to coordination issues later in the semester. The latter concerns could be addressed through a technical companion course offered alongside the studio, which would offer an opportunity to engage in the rigorous quantitative calculations that accompany these approaches.

The most onerous challenge of the studio, however, was related to the physical and cultural distance of the studio from the site: West Africa is nearly 10,000 kilometers from the University of British Columbia, and it is hard to imagine two regions more culturally distinct. It was not possible for students to visit the site during the course of the semester or before due to the distances involved, further exacerbating the problem. Information about the site from personal contacts in the region, when available, was sometimes unreliable, limiting students to information that could be gleaned from print and online sources in the form of films, books, and anthropological studies, but this information is relevant at the macro scale, they fall short of providing the kind of information necessary to generate a genuine understanding of the local site conditions.

4.2 Provisional Lessons Learned

The lack of adequate information about the site raises an increasingly common question for the contemporary practice of architecture and landscape architecture on the global scale: how are architects and landscape architects to generate sustainable designs with incomplete knowledge of site and context? Contemporary notions of sustainability highlight the need for extensive knowledge about locally available materials in the areas of architecture (Van der Ryn, 1996), landscape architecture (McHarg, 1969) and even agriculture (Orr, 1992). As Van der Ryn notes, an "intimate knowledge of place" and local construction techniques make it possible to apply local materials to best possible environmental effect, but little has been written about the difficulty of accessing this type of information within the current mode of practice. Moreover, while an intimate familiarity with a location is a precondition of the technical aspects sustainability, there is a danger of taking the principal too far in the social and cultural spheres. Attempting to design from the perspective of a native of a different culture is a dubious proposition at best, bringing up problematic questions about attempts to assimilate another culture that have been explored extensively by the philosopher Franz Fanon (Fanon, 1952) and Kwame Anthony Appiah, (Appiah, 1992).

Contrary to most contemporary writing about sustainability, the distance from the site can be a positive attribute that forces the architect to acknowledge his or her position as an outsider, necessarily oblivious to the finer grain of a culture. Viewed from this perspective, by preventing the possibility of a designer "going native," the distance from the site can offer the designer the ability to explore options freely without concern for context in a way that is beneficial to the design process and more likely to produce a durable design concept that can be adapted to the particularities of place later in the design process. Privileging design exploration that responds to program in the initial stages (e.g. does not take on the challenges of site directly at first), but has the flexibility to adapt to local conditions as more information becomes available in the later stages of design is an effective way of addressing the initial lack of information, if enough flexibility is maintained such that the design can accommodate new information as it becomes available.

When site is taken away, what remains for the designer? Operating with limited knowledge about a local site and cultural requires architects and landscape architects to fall back on a basic humanism: basic human dimensions are similar around the world despite deep cultural differences that characterize different regions. Relying on a basic humanism shared across cultures will ensure that the range of expression is not unnecessarily limited to speculation about what the designer might imagine could be appropriate to a particular region. At the same time, architects and landscape architects and design should be realistic about the notion of "progress" and about its own limitations. Developing countries in Africa and elsewhere are littered with well-meaning projects that had very different effects to what was intended. Given the difficulty of accurately calibrating design responses to particular contexts, it is important that the designs developed have enough flexibility to accommodate the radical differences that are likely to be encountered as a project moves from the hypothetical to the actual. Designers operating in Africa and elsewhere in the Global south especially from abroad must be flexible and adaptable enough to respond to the different uses of the project as it unfolds. This method highlights the need for provisional responsive decision making that is capable of assimilating new information as it becomes available.

4.3 Guidelines for future studios in the context of the Global South

When preparing studios in the Global South we recommend the following:

- Obtain as much information as possible prior to the studio. Digital survey plans, photos of the site and context, soil analysis should be done well ahead of the start of the studio to allow for the additional time that is often necessary when collecting this information in the developing world.
- Clarify the working relationship with any partners at the outset of the project. A memorandum of understanding (MOU) signed by all parties involved is a good way to establish project expectations and commonly held objectives.
- Conduct precedent studies with a focus on well functioning design and examples both in conditions similar to that of the particular site, as well as those dealing with similar programs in different contexts, to establish a broad range of approaches.
- Initial stages of design should focus on basic common shared human attributes and a relaxed attitude toward local conditions to ensure an adequate range of design exploration. Early stages of design should focus on developing designs that are formally sound rather than perfectly adapted to local conditions.

- Later stages of design development should be approached with flexibility to accommodate specific information about the site as it becomes available.
- Evaluate technology in terms of short and long term effectiveness, and the cost of ongoing maintenance and upkeep. Simple technology is generally preferable.
- Design for long term flexibility. NGOs and other supporting organizations come and go in the Global South. Seek to develop durable architecture that can be repurposed to offer ongoing tangible benefits to local communities in the event that project sponsorship is eliminated.

5.0 CONCLUSION

This paper presents an approach to the significance of place when developing sustainable designs for distant sites. Most contemporary notions of sustainability are predicated on an intimate knowledge of place for projects to realize their ecological potential, which is often at odds with the way projects are developed in the contemporary practice of architecture and landscape architecture. There are many indications that global projects will continue to increase in professional circles, and instructors at design schools must address issues related to global practice to adequately prepare their graduates for professional practice. This paper provides a description of one such project in an academic setting in order to propose a set of working guidelines and provisional lessons learned that could guide Western architecture and landscape architecture schools seeking to implement sustainable design solutions at a distance in Africa and elsewhere in the Global South. The set of guidelines offered a first attempt at a methodology for dealing with design for distant sites. These principles are developed for Western firms operating in the context of the Global South but could be applied by others working in unfamiliar contexts at a distance.

REFERENCES

Appiah, Kwame Anthony, In My Father's House: Africa in the Philosophy of Culture. Oxford: Oxford University Press, 1992.

Chinn, M. D. and Fairlie, R.W., "The Determinants of the Global Digital Divide: A Cross-Country Analysis of Computer and Internet Penetration" Oxford Economic Papers , New Series, Vol. 59, No. 1 (Jan., 2007), pp. 16-44.

Fanon, Frantz. Black Skin, White Masks. trans. Richard Philcox. NY: Grove Press, 2008.

Mang, Pamela: "Regenerative Design: Sustainable Design's coming Revolution" Design Intelligence, 2001.

Mang, Pamela and Reed, Bill. "Designing from place: a regenerative framework and methodology." Building Research and Information 2012 40 (1), pp23-38.

McHarg, Ian: Design with Nature. Garden City, New York: Natural History Press, 1969.

Orr, David W. Ecological Literacy: Education and the Transition to the Postmodern World. Albany:, New York: State University of New York Press, 1992

Ramage, M. H., Ochsendorf, J.A.; and Rich, P. "Sustainable shells: New African vaults built with soil-cement tiles." Proceedings of the 2009 International Association for Shell and Spatial Structures (IASS) Symposium 2009. Valencia, Spain: Editorial de la Universitat Politécnica de Valencia, 2010; pp 1512-1520.

Van der Ryn, Sim and Cowan, Stuart. Ecological Design Washington DC: Island Press, 1996.

Young, Jeffrey R. : "'Open Courseware' Idea Spreads." Chronicle of Higher Education, 2005, Vol. 51 Issue 26, p 32-33