

[westernization in sub-saharan africa]
facing loss of culture, knowlege and environment



WESTERNIZATION IN SUB-SAHARAN AFRICA
FACING LOSS OF CULTURE, KNOWLEDGE, AND ENVIRONMENT

by

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Abstract:

Sub-Saharan Africa faces many challenges; among them is the struggle to westernize. But is westernization really the answer for this large 'third world' population? Westernization has stripped many of the cultures that make up sub-Saharan Africa of their knowledge bases, knowledge of tradition, and pride in culture. The principles behind International architecture indicate to this part of the world that the way they are living (with sensitivity to earth, season, and hardship) is uncivilized. That instead of grass huts that can be rebuilt if a drought causes a family to move, they must build multi-story buildings in town centers, out of concrete in order to be considered civilized. Instead, the loss of this pride in culture can be reversed. This thesis investigated whether or not architecture can be created in this third world region that gives thought to aesthetics, environment, culture and socio-economic situation; Can a building built in sub-Saharan Africa be constructed for more than just the function of shelter, no matter what the aesthetic costs? Can it be functional, affordable, easily constructed and take into account design aesthetic? A new generation of architecture can emerge in Africa: a generation of sustainable, aesthetically sensitive buildings that educate inhabitants about their heritage and environment; a generation of architecture that begins to return pride in culture and heritage to populations in grave danger of losing knowledge of both.

[westernization in sub-saharan africa]



It is important to first divine the difference between westernization, colonization, and globalization. Westernization is defined in the American Heritage dictionary as an “assimilation of Western culture; the social process of ... converting to the customs and practices of Western civilization”¹ the terms customs and practices generally refer to such matters as industry, technology, law, politics, economics, lifestyle, diet, language, alphabet, religion, or values; and the term ‘Western’ refers to American as well as western European culture.² Westernization has been an accelerating influence sweeping the world in the last few centuries; however westernization is usually a two sided process. Western influences and interests must be met by a wish of at least part of the affected society to change towards a more western model of society, in the hope of attaining western lifestyle or some aspects of it. If it was not a two sided process, it would be considered colonization, not westernization.³ However, westernization has different degrees of “domination, destruction, resistance, adaptation, and modification of the native culture.”⁴ In a situation where the native culture experiences destruction because of a more powerful outside culture, a “shock phase”



Fig 1.1 Instead of traditional exterior finishes, advertisements for goods are being painted on the outside of buildings

is often the result from the encounter. During the shock phase, “civil repression using military force may lead to a cultural collapse, or ethnocide.”⁵

Western designers must be cognizant of the affect that American culture can have on another. I am in no way saying that westernization is all bad – it brings with it raised standards of living and new technology much needed by developing countries. However, westernization is often all encompassing. According to Conrad Phillip, author of *Window on Humanity*, westerners will “attempt to remake the

native culture within their own image, ignoring the fact that the models of culture that they have created are inappropriate for settings outside of western civilization”⁶ It is the all-encompassing westernization that I will refer to in the rest of the study, for it is this all encompassing westernization that threatens to take over the developing countries of Africa: the complete and total disregard for traditional culture, customs, natural environment and socio-economic status of the place, whether by the westerners or the inhabitants of the place itself. These countries are facing ethnocide without the help of westernization, we cannot be cavalier and help them achieve that end by mercilessly pumping our products (fig 1.1, fig 1.2), ideologies, economic structures, political structures, architecture, and technology upon them. It is a two sided process, but we as westerners can encourage, and lead by example cultural awareness, and preservation of tradition; we can help them find a balance that does not encourage ethnocide.

All encompassing westernization borders on colonization, not physical colonization but cultural. Physical colonization is the extension of a sovereign nation over a territory outside of its proper borders. According to the Columbia Encyclopedia, “before colonization can be effected, the indigenous population must be subdued and assimilated or converted to the culture of the colonists.”⁷ Westernization does

not follow colonization in that respect, but both all-encompassing westernization and colonization generally “dominate the resources, labor and markets, and may also impose socio-cultural, religious and linguistic structures on the indigenous population”.⁸ This thesis will not address colonization further, but it is important to understand how closely related westernization and colonization *could* be.

Globalization is not an imperialist movement, it is a term referring to the increasing global “connectivity, integration, and interdependence in the economic, social, technological, cultural, political, and ecological spheres.”⁹ It is the “process by which the experience of everyday life...is becoming standardized around the world.”¹⁰ The Encyclopedia Britannica also states that “many scholars studying the patterns of globalization believe these patterns are converging, resulting in homogenization of culture.”¹¹ Globalization in itself is inevitable, with television, mobile phones, and satellites to send information around the world in seconds. We do, however, have control over whether or not globalization homogenizes our cultures. Globalization’s affect on westernization is simply adding fuel to the fire. The western lifestyle is readily viewed, emulated, and purchased

around the world (fig 1.2); globalization can be seen as simply strengthening the movement of westernization. Instead, let us look at globalization as an opportunity to temper westernization. Globalization offers many advantages that don't have directly to do with westernization – international shipping, material improvements and imports, the sharing of more efficient construction methods from all over the world – not just the western world.

The western mentality has had a large impact on the continent of Africa. Unfortunately, its level of influence was not spread evenly over the geography of the continent. Northern Africa (countries above the Sahara) is considered very modern by the world's standards. Large cities, skyscrapers, corporate industry are all markers of westernization. But what was westernization's impact on sub-Saharan Africa? Because these countries are located farther from the modern world (Europe), and separated from northern Africa by a large desert, there quickly grew a disconnect between the two hemispheres. The same ideals were presented to sub-Saharan Africa, westernization still was the goal. But these countries, many of them labeled third world, lacked the resources, the organization, and the time to achieve their goals like their

Northern neighbors: Egypt, Sudan, Morocco etc.

Instead of inspiring these sub-Saharan countries to modern living standards, these countries became slaves to the idea of westernization. Instead of living in their waterproof huts constructed of natural materials, it was seen as a step towards modernization to live in a shack made of cardboard and tin; one that leaked, and kept cooking smoke inside of the building. While modern architecture offers many improvements to the standard of living, it does no good if it cannot be constructed properly. Westernization gave sub-Saharan Africa a goal that was simply impossible; the vision of the future lacked the necessary steps to carry rural, nature-centered life to urban life. Westernization also flagrantly disregarded the agricultural and nomadic life traditional in the harsh African climate. To encourage permanent, monolithic (in comparison to traditional architecture) architecture goes against the unpredictability of the climate. Not only that, but most people in sub-Saharan Africa spend most of the day outside, farming, in order to grow enough food to simply survive. In order to have the culture and industry to support large cities built with imported materials, sub-Saharan Africa would have to go through a massive economic and agricultural change.

Westernization not only brought with it ideas that suggested to the societies of sub-Saharan Africa that their naturally built villages were uncivilized, but that many of the pieces of their culture were barbaric. Africa



Fig 1.2 Even in a non-English speaking area, where the family has no television, American culture is still prevalent.

has a long tradition of natural medicine. In fact, Dr. Hans Martin points out that “African people survived for at least four million years in an extremely hostile climate. We have to acknowledge that pre-modern medicine was highly developed.”¹² Artwork, weaving, dying, and farming were all celebrated in pre-modern Africa. Today families not only struggle to survive, but also to make money for modern amenities. Westernization has started the very dangerous process of wiping traditional knowledge bases of culture and heritage from sub-Saharan Africa. People are no longer connected to,

familiar with, or proud of the land that they live on; natural resources becomes something to be exploited in pursuit of monetary rewards. In Africa, culture has been passed on orally, through stories. Because of migrations, wars, and westernization, old knowledge is being lost; what elders knew and practiced before is not valued any more.¹³

The loss of this knowledge is really a grave issue. If the population still retained this knowledge of and pride in heritage, they would be in a better position to benefit from their own natural resources. This would lead to fewer resources spent on regaining the lost information, learning the same hard lessons already learned, and more resources spent instead on improving the quality of life.¹⁴ For example,

“If you were a primary teacher in the Tropics, and you suffered from rheumatism, you would have to spend an entire month’s wages (US \$11) to buy an ointment for rheumatism in a pharmacy in the capital! On the medicine packet you read that the active ingredient is *capsicum frutescens*. Unfortunately you do not know that this is an extract of chillis, a plant which in tropical regions, grows right

outside almost everybody's front door. With this same amount of money, you could produce almost 3kg of the ointment in the village."¹⁵

If the teacher had been taught by a local village person the importance and effectiveness of natural medicine, her paycheck could have bought better food, or gone to support a family who did not have as much money.

Westernization has not only encouraged a disinterest in natural medicine but also encouraged the loss of knowledge about local crops. Villagers no longer know which plants are nutritious and grow easily within a given region. Families used to raise their own food, for use by the family. Spare food was then sold in the market for money to be used for improvement of quality of life. They now see local crops as exports, something to be harvested and sold in order to make enough money to buy *imported* food.

"...high quality cattle are taken to the town and sold; Villagers they buy tins of corned beef, which contain meat of poorer quality. Villagers are also given little money for their precious palm oil. In the town it is sold again at a much higher price and is then

exported from there to Europe, where expensive soaps like Palmolive and others are made with it. It is then transported back to Africa and sold at a price one can hardly afford, because they contain 'tropical oil'."¹⁶

Development is unavoidable, but what is avoidable is the blind, uninformed, resource-eating typical westernization found in this part of Africa. Too often this type of development is achieved through the best of intentions: in the rush to provide these countries with adequate shelter, humanitarian programs and designers alike simply seem to see aesthetic consideration, climate response, and traditional culture as a luxury. Westernization is imminent, but advocates could begin to develop alternative visions for these countries to strive for. To take the good parts of westernization: clean, comfortable, organized living; and adjust the concept slightly to include living that is appropriate for climate, resources, culture, and lifestyle could produce a new generation of architecture in the 'third world'. It simply takes a new frame of mind for those designers and planners in a position to help the sub-Saharan develop in a healthy, culturally aware, positive vein. After all, "in Europe, if a library were closed, there would be a public outcry. In Africa however, and everywhere in the South, a whole library is buried with every old person who dies."¹⁷ If we are to restore the pride of culture to these countries, we first have to analyze the idea that is being presented as



Fig 1.3 Two orphan children in Tanzania - at risk of learning an American culture instead of their native culture

ideal development. Dr. Hans Martin Hirt addresses this issue in the following statement:

“a dramatically more helpful approach would be, however, to facilitate African people in valuing what they know, and relearning what they knew before; this would mean spreading genuine local knowledge, instead of simply importing products from Europe or America.”¹⁸

It is only after Africa has gained back the traditional knowledge base that has been lost, can they truly move forward into a modernity of their choosing, based on

their culture and value structure. These countries can move forward, not as a completely new nation, but one with a past and a respect for that past. The challenge then becomes how can architecture play a role in educating a culture about their past, while still encouraging forward growth? Architecture, typically a reflection of a culture's socio-economic and political situation can also inspire a community to preserve and continue traditions. Architecture cannot be the solution to every socio-economic difficulty that third world countries encounter, but value in the built environment can do wonders to help boost pride in community, culture, tradition, trade, business, and government. When that built environment speaks clearly of the culture's defining characteristics, and is modern in nature while giving a nod to a culture's rich past, it makes it all the easier for the community to identify with and be proud of that heritage. The community then can feel a congruence between traditional values and modern values, manifested in an equally balanced built environment.



[African Culture]



II. African Culture - AIDS

It does not take much thought to produce a list of issues that need to be addressed or improved in sub-Saharan Africa. Eighty percent of Africans live in extreme poverty, and the living conditions are substandard. Does this mean that everything should be destroyed and rebuilt to American standards?

Recently, many studies on ecological building and the merits of fully sustainable buildings have awakened a fresh view on traditional housing around the globe. Instead of pushing westernization on third world countries, some argue that we should instead be taking notes on stewardship of environment from them. Does this mean that we should make every new building out of thatch and adobe like the traditional models? An author who traveled extensively doing research on AIDS observed "...during my years of apprenticeship in Zaire, I met thousands of people who never produced even a small bucket full of rubbish... Twelve year olds construct their own houses using natural materials and pangas [machetes] only, huts that remain waterproof for years."¹⁹ This picture is idyllic in many senses: people living simply off the land, creating little waste, housing made of natural materials. It is unfair to say, however, that this is how it must remain forever. Dr Hans Martin Hirt believes that



Fig 2.1 AIDS has a tremendous impact on the social structure of Africa. Here, the children from an orphanage gather to sing. These children have all been orphaned in the last 2 years.

"The third world has every reason to be proud. It provides the rest of the world with nature-oriented guidelines on how to cultivate this earth and protect it against destruction. It presents the means by which our globe could easily survive for another few million years."²⁰

The key to successfully implementing a new architecture in sub-Saharan Africa will begin and end with the careful analysis of past, present, and potential architecture in the area. There are methods and techniques in traditional architecture that deserves to



Fig 2.2 Dan Tanner, head of Mavuno Village orphanage sits with a family who is housing one of Mavuno's children. Family contact is very important culturally, and orphans benefit from family placement

be recognized and carried forward. There are current living conditions that need to be addressed and revised. Success will be found when the built environment reflects the values, history, and ideals of the place the architecture resides in. When each building feels as if it belongs to the environment it is placed in whether it is through form, or material, or both; when the built environment responds cleanly and directly to site conditions, climate, socio-economic status, local material and labor forces. It is the balance of these issues that will lead to an architecture that is healthy *and* helps Africa move into the 21st century with pride

and dignity.

There is within the notion of westernization and modernization room for sensitivity to land, place, culture, and socio-economics. Likewise, within sustainability there lays room for consideration of quality of life, medicinal advances, and the importing of goods. As westerners, we easily recognize the pros and cons of western civilization. What then can be learned and emulated from sub-Saharan Africa? What pieces of their culture should be preserved and celebrated? And what pieces can be improved? Because cultures all over southern Africa are so different, the answers will be different for each region. There are generalizations that can be made, and we will focus on the broad issues for now. In order to truly encourage a culture to move 'forward' in development, one must truly understand the challenges that that culture faces in making those changes. It is only then that the improvements can genuinely improve the quality of life and become accepted as forward movement by the culture in which it resides.

As sad as it is, HIV/AIDS has tremendous impact on sub-Saharan culture.

"AIDS in Zambia is widespread. According to the US Bureau of the Census, it had reduced life

expectancy to 37 by 1998. It would have been 56 in a world without AIDS...No one knows how many children have been orphaned. The US Agency for International Development and the UN estimate that in 1990 11 per cent of children under 15 had lost their mother, father or both parents. By 2001, 17.6 per cent had lost one or both parents, two-thirds to AIDS.”²¹

This disease, along with westernization threatens to destroy entire cultures. The disease leaves many children without the benefit of growing up in a family (fig 1.5). Instead, they grow up in westernized orphanages, never learning traditional values, customs, or skills (fig 1.4). Emma Guest, a researcher and author about the sub-Saharan AIDS crisis goes so far as to write “African countries face a stark choice. If they do not find ways to care for the growing multitude of AIDS orphans, they could soon find their streets crowded with angry, intoxicated adolescents.”²² Whether we like it or not, the improvements in sub-Saharan Africa may come to a proverbial stand-still if this disease is not checked.

“HIV/AIDS has caused
indescribable suffering to

millions of people. In 2002 alone, 5 million people were infected, bringing the global total of people were living with HIV/AIDS to 42 million... UN Aids figures suggest that 29.4 million people are affected in sub-Saharan Africa, where more than 11 million children have been orphaned by AIDS.”²³

The reality is that AIDS is creating a society without a middle age range. The elderly or orphanages are raising the orphaned children. This disease has caused the breakdown of many traditions in the sub-Saharan culture. The African extended family has traditionally nursed its sick, and absorbed its orphans without fuss or legal process.²⁴ However, the sheer number of orphans will soon overwhelm the elderly population of these countries. Alternative care is soon becoming a desperate necessity for these AIDS ravaged countries. When elderly cannot care for abandoned or orphaned extended family, AIDS creates households headed by children as young as nine years old, acting as guardians to siblings; households with little to no income.²⁵ In other cases, children are sent to orphanages.

“The knee-jerk reaction to an orphan crisis might be to build orphanages. Thankfully, governments have not rushed to do this. Children rarely thrive in such places. Even when staff are loving, and donations from overseas churches ensure that their charges are well fed,



Fig 2.3 Here a young girl carries one of her siblings. If AIDS continues to destroy family structure, a girl this age could be the head of an entire household.

institutional life can be grim... People agree that the best place for children is in a family. If this is not possible, the next best thing is to provide some form of care within their community of origin."²⁶

Of course, AIDS is not the only health hurdle that developing countries in this part of the world face. Cities rarely have adequate health care facilities; they lack the human and organizational infrastructure to implement

even the simple treatment for tuberculosis, or immunize children, let alone the demands of administering complex drugs to treat AIDS.²⁷ In short, before large cities can be built, Africa must first confront its devil head on; it must focus on educating and caring for its sick, wounded, and abandoned. Through education, Africa has a fighting chance to avoid another outbreak of these diseases.

"In the Tropics, because of war, poverty, rising prices, and increasingly stringent patenting laws, about 80% of the population no longer have access to the imported so-called 'modern' medicine. But the knowledge of their own medicinal plants has been lost as well. In condemning over decades all manner of witchcraft and superstition, many whites have, at the same time, condemned also the best of local herbal medicine."²⁸

The education of the younger generation is no longer a luxury, it is a necessity; vital to the survival of the culture that we should be struggling to preserve. Without this important knowledge, there will be no culture to preserve, and obscure and helpful knowledge of the

world's tropics will be lost forever.

As the AIDS and health care crisis gains notoriety in the western world, let us see this tragedy as an opportunity to assist these countries. Let us encourage community development that is focused on healthy living, healthy building, and education of the future generation in traditional practices. Rather than encouraging these ravaged countries to forget their painful past and to re-invent themselves, let us encourage them to remember the positive attributes of their cultures – something worth fighting for, something worth keeping, something worth respecting. It is out of this respect that I feel new communities will begin to develop: communities that are sensitive to health, to environment, and to consequences of choice. It is through these communities that the third world will develop with its head held high. This sensitivity can begin with studying traditional art and architecture – the foundation of a community. When one understands the traditional way people lived, and why they lived that way, they can accurately assess what should be preserved, and what can be improved.

[Traditional Architecture]



II. African Tradition – Architecture and Culture

Africa is a continent of 53 independent countries, all home to a rich mix of native peoples, cultures, economies and history. Africa is home to the largest desert in the world, many tropical rain forests, rugged mountains and vast savannah. It is the second largest continent in the world, second only to Asia.²⁹ Africa is a vast, complicated, and contradictory continent; as historian Nnamdi Elleh states so eloquently,

“the history of African architecture is too complex and vast a topic to cover in one book because of the continent’s size. Africa has an area of about 11,700,000 sq miles, more than three times that of the united states, including Alaska. About 80 percent of the continent lies within the tropics and has more distinct peoples and cultures than any other continent”³⁰

In the interest of time, this thesis will examine the forces that influenced Africa as a continent (fig 2.4), and then continuously focus our view on Sub-Saharan Africa, Eastern Africa, and Tanzania and Kenya in that order.

Africa is considered by many modern historians to be a ‘dark continent’; a place incapable of independent creativity in architecture and art. There is an overarching



Fig 2.4 The continent of Africa

presumptuous belief that Africans lack the ability to build magnificent structure and that any monument in Africa is of foreign inspiration or origin.³¹ These beliefs have long stood as obstacles in the study of African architecture. Even in Africa, architects themselves, and the general public all lose in this complex situation.³² African architecture is rarely studied past the traditional local dwellings; generally to avoid stepping on proverbial toes. Nnamdi Elleh offers an explanation:

“these problems relate to architecture because architecture is one of the most visible symbols of statehood and civilization. As a result, the questions



Fig 2.5 These round huts made of adobe and thatch are similar to the huts ancient Egyptians used to store grain, and are thought to be what influenced traditional architecture south of the Sahara

of who built what, who migrated from where, whether ancient Egyptians were African, and whether slavery and colonialism retarded the development of architecture are significant in African history and make the subject more complex.”³³

It is important to point out the mystery and complexity tied to these studies; varying influences often overlap in a small area, studies are often political in nature, and the issues of colonization and slavery make conclusions muddy and often socially judgmental. Some influences are clear throughout the continent, and those

will be the things this thesis will focus on.

Egypt has long been one of the driving forces for the entirety of Africa architecturally and economically. Any country whose history is as powerful and globally influential as Egypt's cannot help but to influence its geographic neighbors. It is hard to compare the beautiful, iconic architecture of the Egyptians to the traditional beehive-like dwelling of the many sub-Saharan cultures, but there are influences if it is studied. Egyptians have recorded in their history that their ancestors came from the ancient kingdom of Punt, which was located in present-day Somalia and Ethiopia. In early Punt, round huts [made of adobe and thatch] were developed and used as dwellings and grain storage (fig 2.5). This architecture influenced Egypt, and in turn, the rest of Africa as well; Egyptian architecture was built on the same traditional forms and materials that sub-Saharan African architecture is. An ebony table of King Menes dating from 3100 BC has a woven thatch house carved on it, and the mortuary temple of Queen Hatshepsut at Deir al-Bahari depict round houses such as are common all over Africa today.³⁴ A majority of historians believe that most of the house forms that are recognizable as 'traditional' African architecture have roots in Egyptian culture.

II. African Tradition – Architecture and Culture

Egypt however was a resource rich culture with close ties to the middle east, Europe, and Asia. Its proximity to the developing world, and its access to natural resources allowed Egypt to develop at a rate that far exceeded the rate of development in its neighbors.

Narrowing our view to Sub-Saharan Africa (fig 2.6), we see that both the Egyptian kingdom and religion play large roles in the development of traditional architecture (fig 2.8). The Islamic religion was brought to Eastern Africa (northern and sub-Saharan) in the 1800s by the Sufi, a sect of Islam by way of trade routes on the Red Sea, Mediterranean, and the Arabian Gulf. This Arabic-African culture became what is known as modern-day Swahili culture⁹. Arabian influence is still strongly felt in many of the sub-Saharan cities: mosques, bazaars, and the idea of walled compounds traveled with the Arabian and found a home in Tanzania, Kenya, Uganda, Eritrea, Somalia and Ethiopia. Trade was not restricted to Arabian neighbors, but Eastern and Sub-Saharan Africa enjoyed trade with China and India as well; resulting in a large number of Chinese and Indian immigrants in these countries, bringing with them new building techniques and materials. The eastern culture brought with it a sophisticated sense of business, textiles, and the idea of courtyards. This rich trade lead the way to German colonization for



Fig 2.6 This map shows the countries referred to as “sub-Saharan Africa”

much of Eastern Africa, until after World War I when much of Eastern Africa was colonized by Great Britain.

Contrary to popular belief, the Eastern sub-Saharan region of Africa has been home to some extraordinary examples of architecture; architecture that proves that Africans once enjoyed extremely advanced expertise in construction, and design. Donahue, a historian, proclaims Saint George's Church (fig 2.7) the 'eighth wonder of the world' – many churches like this are carved into solid rock 8,000 ft above sea level in the mountains of Ethiopia.³⁵ This area of Africa specialized in cliff-dwellings, rock carvings, and subterranean churches and palaces. In fact, much like some native American

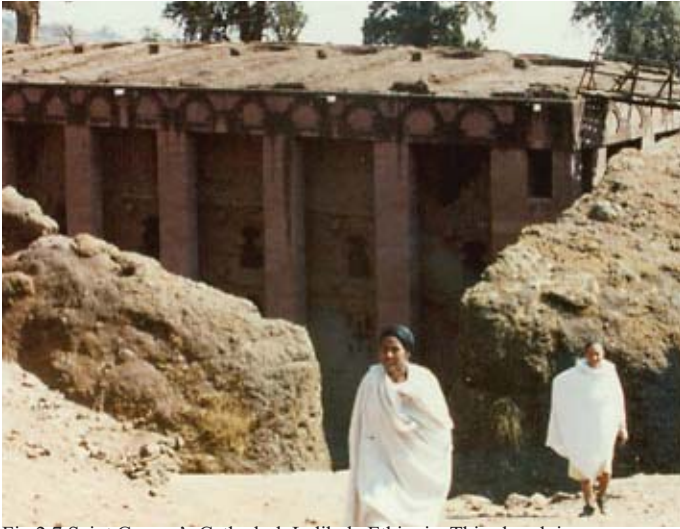


Fig 2.7 Saint George's Cathedral, Lalibela Ethiopia. This church is carved straight out of rock, and sits on the side of a mountain



Fig 2.8 Nakori Mosque - religion had a large role in the development of architecture in Africa

tribes, there were whole cities carved into natural cliff faces! Little of this has been studied or recognized, truly many ancient buildings sites go undiscovered and underappreciated in this area of the world.

These examples of sophisticated, aesthetic, sustainable design are sadly not the rule throughout sub-Saharan Africa, they are the exception. Cultures in Sudan, Tanzania, Somalia, and Tanzania are often centered on agriculture, or the raising of cattle. In these countries, lack of roads or transportation make the importation of materials difficult bordering on impossible. Houses are therefore built from local material, using local labor forces to construct them. Because of the nature of agrarian society, these cultures rarely have extra money for extravagant houses or imported embellishments. In some parts of Tanzania, corrugated tin roofing is still considered a luxury; irregardless of the fact that tin roofing acts as a solar heat collector and makes a house more uncomfortable than the traditional thatch, which allows air circulation and does not transmit heat like tin. The imported material is still seen as a sign of wealth and power.

Kenya and Tanzania are both countries in the Eastern Sub-Saharan that are blessed with many natural resources. The plain of the

II. African Tradition – Architecture and Culture

Serengeti stretches between them, bringing in tourism, capitalism, and larger cities. Nairobi (fig 2.8), Kenya, Arusha, Tanzania, and Dar-Salaam, Tanzania are all large cities formed in the time of colonization that have continued to grow and prosper into modern times. These cities however, sometimes overshadow the agrarian societies that still exist in the surrounding countryside. They are proponents of idyllic westernized Africa. Historian Namdi Elleh explains:

“the architecture in Nairobi has some hybrid Victorian-style buildings, but the skylines, like that of Lagos and many other major African cities, is predominantly international, with no reference to African culture. African cities in this category perpetuate a fallacy that there is nothing to be gained from the African village or city layout.”³⁶

Even these cities, situated in the heart of Sub-Saharan Africa, don't acknowledge their African heritage. Kenya and Tanzania are excellent examples of the disconnect that exists between those still living in traditional African ways, and those living an almost fully westernized life, oftentimes within one hundred kilometers of each other. Several ethnic groups inhabit this



Fig 2.9 Nairobi, Kenya's skyline

region, the major ones being: the Maasi, the Sukuma, the Haya, the Gogo, the Sonjo, the Fipa, the Chaga, the Rundiha, the Luguni, the Ngoni, and the Hehe.³⁷ Many groups still live the way their ancestors did, and few have access to the amenities of their brothers in the large cities. For example, the Sonjo inhabit the district in northern Tanzania that borders Kenya. Their culture is mainly agricultural, and their social structure and building style still reflect and revolve around this. The Massai are “engaged in pastoralism and agriculture which favors certain crops on the plains of Tanzania and allowed the rearing of cattle.”³⁸ The Massai still live in centralized communities built of round stone houses with thatched roofs (fig 2.9). If water or grass becomes scarce, these communities may be moved and rebuilt as needed to sustain beast and man alike.

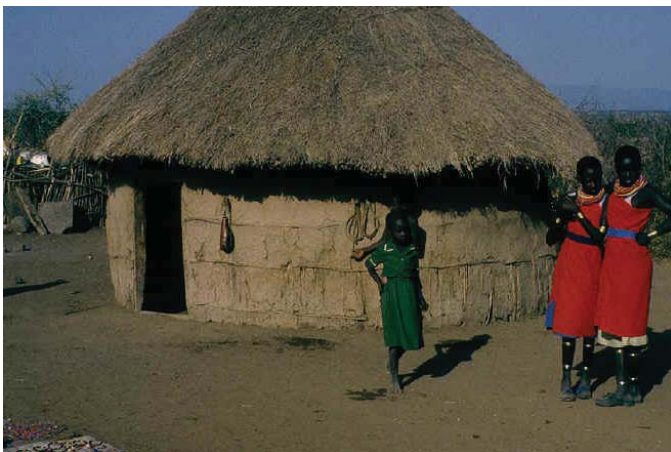


Fig 2.10 Traditional Masi dwelling, stone or adobe block covered with thatch.

In these countries, traditional architecture does not change quickly. In fact, it is passed down from one generation to the next, using technical skills (such as the process of building adobe block, or creating a thatch roof that won't leak) to build forms similar to the original examples. To stray too far from these traditional models will alienate the culture's identification and process of historic education. Buildings all over this region, regardless of specific cultural construction, share certain traditional characteristics that can begin to serve as a starting point when considering historic typology for this region.

Walls of buildings in typical villages and cities are made of clay, mud, or adobe. Recently, buildings have explored the use of concrete, but few understand the chemical bonding properties or the process needed

to accurately construct a concrete building. If the village or city does not have access to a commercial construction crew, or a worker with hands-on experience from one of the larger cities, concrete can become a health risk, instead of a professional use of material. Walls are built with smooth rebar (or no rebar) inside of them. Walls are let to dry in the sun with no water to help them cure. Water is added to the mix to keep it "wet" as they work with it. These are all examples of concrete being used incorrectly. Education about these materials needs to be widespread before concrete is considered a safe building tool in these countries without express supervision. Concrete could be a great building tool – it is easy to work with when its properties are understood. It can be used in place or combined with traditional materials in many of the same ways. It is strong, resists fire, and needs only manual labor to construct. Many adobe bricks made in sub-Saharan Africa today could have concrete added to them for strength and permanence or bricks could be made entirely from concrete using the same mold typically used for adobe bricks.

Houses that use rooftop ventilation are still common in several parts of sub-Saharan Africa. (fig 2.10)

II. African Tradition – Architecture and Culture

“The kikuyus use poles for the walls of their houses. Usually the houses are circular in shape, and the roofs are made from poles that are tied together for the rafters and the saplings... The rafters meet at the apex, and thatch is used to cover them. Thatch usually insulates the house from intense sunlight because it doesn't transmit heat; however, thatch has the disadvantage of impermanence.”³⁹

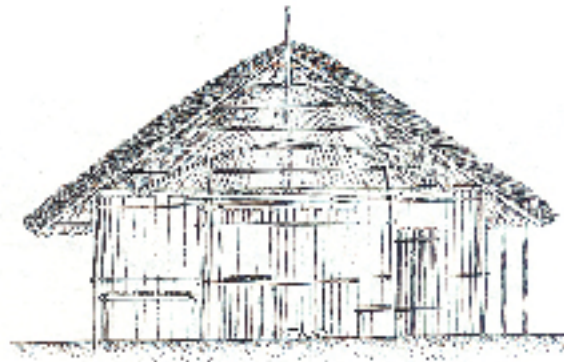


Fig 2.11 Traditional Kuyiku dwelling - section sketch

Thatch acts as natural ventilation, and many traditional structures have large doorways that are left open during the day to encourage air circulation. As many of these people still regularly cook with charcoal, ventilation is extremely important in a house. The prevailing winds in Tanzania not only cool houses on hot days but also carry away the heavy sooty smoke made by fires for cooking and washing. Native builders acknowledged this necessity; something that the recent tin and wood shacks overlook, much to the detriment of their inhabitants. Many of the traditional huts of each ethnic group are vaulted or conic in shape to encourage smoke to rise and be swept away by breezes.

The courtyards found in early Egyptian architecture are re-invented in traditional housing all over Tanzania and Kenya. These outer walls

not only act as a barrier between neighbors but also to unfriendly foe. Families are often located together in one larger compound, with the livestock located in the middle of the buildings. Courtyard walls may be constructed with nothing more substantial than sisal poles (fig 2.11), or bamboo, but the idea is still communicated to the community at large: this is my space, keep out if you are not a friend. Society in this part of Africa is very welcoming to all 'friends' as acquaintances and extended family are automatically welcomed into a home. It is considered rude to turn anyone away from your door. Because of this, traditional African families, usually women, take very good care of the home. Floors are swept several times a day, and things are generally kept relatively neat and tidy.

There are clearly beneficial aspects to Africa's traditional architecture. Much of the architecture is built in harmony with nature and the ethnic group's way of



Fig 2.12 A living fence serves as a boundary marker for the family



Fig 2.13 A traditional house against a new 'modern' well built brick dwelling. The traditional dwelling has adequate ventilation, the newer one does not

living. Unfortunately, many of these aspects are not interpreted correctly. Some local building groups have attempted to simply replicate this traditional housing, something that rarely appeals to local individuals. Locals generally want to feel that they are moving 'up' in the world, toward westernization (fig 2.12).

"some recent works by architects who dared to investigate the genius loci of the African environment and the tradition of building bear this out and are beginning to have an impact. In Uganda, the works of Justus Dahinden at Namugongo National Shrine Cathedral and Mityana Pigrims Shrine demonstrate that traditional African architecture has dynamic metaphors and repertoires that can be exploited to create architecture that is uniquely African and to which users can respond."⁴⁰

It is this balance that must be struck: traditional and modern. It is there that local people will be able to keep their heritage and find pride in new architecture. Architecture that clearly acknowledges the functional, rational, and indigenous roots of this region.

II. African Tradition – Sukuma Culture

Because there is such a range of variance in traditional housing in even Kenya and Tanzania, it is important to look at the sub-culture as well as the larger environment that the sub-culture is influenced by. The southern shore of Lake Tanzania is home to a Swahili sub-culture, the Sukuma people, and that is where this thesis will focus.

This culture is an ideal setting to study the reconciliation between modern and traditional ideals. The Sukuma people are gaining an interest in spreading traditional values, Mark H.C. Bessire goes so far as to say: “This reflects an increased interest in utamuduni (traditional culture)... today, a revival of Sukuma culture is taking place among traditional doctors, chiefs, artists, and dancers.”⁴¹ The people are also very interested in gaining a ‘western’ life, and follow American culture as closely as possible. Children watch WWF on TV, artists have begun producing their own music videos and are interested in recording CDs to sell on the internet, and young people listen to many American pop-music artists.

The Sukuma are one of the largest ethnic groups in Tanzania; an estimated 3.2 million members make up approx 10 percent of Tanzania’s total population. The Sukuma are considered people of the Bantu, a “general



Fig 2.14 A Sukuma man dances in front of the crowd at a competition between the Bageiika and the Bagaalu, famous dance groups.

term for over 400 different ethnic groups in Africa, from Cameroon to South Africa, united by a common language family (the Bantu languages).⁴² The Sukuma are predominantly subsistence farmers and cattle herders whose culture is based on cooperative social networks.⁴³ Though they are subsistence farmers, the Sukuma enjoy a rich history of art and culture. Their most recognized talent is by far dancing; annual dance competitions are still held between influential Skouma families (fig 2.14). Traditional dance competitions were used to settle conflicts, acquire new land, win respect, and were a time for many Sukuma to come together for socialization, food, and fun. Competitions are judged on



Fig 2.15 A man uses fire to attract attention at a dance competition.

crowd reaction and favor, and as a result many of the traditional families developed spectacular techniques to awe the crowds. One family did their dance with hyenas, one with African porcupines, and others used magic, fire, snakes, drums, and ropes. These dance techniques were family secrets passed down through generations, to ensure a rival family did not ever have the upper hand. The dance competitions involve elaborate costumes, props, and music as well. The Sukuma have mastered the art of drumming, and still hold drumming festivals in coordination with the dancing competitions.⁴⁴ The Sukuma were also masters of traditional medicine. Many of Africa's most famous healers and witch doctors

hailed from the Sukuma lands and many of these families are still in existence today. These healing arts were passed down from healer to specific offspring, selected for their ability to correctly perform and pass down the healing arts. Many of these healers possessed amazing talents and knowledge. One family was known to make a balm that could be spread over the body to protect it from burns in a fire. A person could literally smear the concoction on, stand on a pile of burning reeds, and be fine. These secrets are being lost, both through the loss of entire families to AIDS and the stigma now attached to traditional healers and witchcraft.

For most of the year, however, the Sukuma live in rural areas outside of the city of Mwanza, Tanzania. Family life is centered around farming and the raising of cattle. Everyone in a village is considered a relative, and children are often watched by many different village women.

The architecture in this culture is a reflection of their agrarian-centered life: square or round adobe walled-structures with thatched roofs are the norm in most rural villages (fig 2.16). Round buildings were generally reserved for officials and witch doctors, while villagers lived in more rectangular buildings. In most

II. African Tradition – Sukuma Culture

rural housing, there is no foundation built, the family simply buries a course of the adobe in the ground. Roofs are held up by sisal poles lashed together to form “trusses”. Doors and window shades are also made of sisal poles lashed together tightly with sisal rope. (where bamboo is available, they may use bamboo instead of sisal). Traditionally, the adobe was coated with a clay or mud slurry. The buildings were then painted with brightly colored symbols for health and protection against evil spirits, and snail shells were attached to roofs to encourage rain. Houses were located close together, with a town hall and market serving as the “center” of town. Each house had ample space in their own courtyard for a cooking shack (often attached to the main building), and a good-sized garden plot. Small fences (sometimes living fences made of sisal plants) divide one family’s area from another, but very rarely is this fence used as a privacy fence to block visitors. On the outskirts of the village were larger plots of land for more extensive farming or for crops that needed more space.

The village of Kitongo-sima, the site of this thesis project, located an hour east of Mwanza is little different than a typical rural Sukuma village. They subsist mostly on corn,



Fig 2.16 Traditional Sukuma dwelling - mud plaster over adobe and thatch

cassava root, beans, and rice. Because of its proximity to Lake Victoria, this village eats more fish than beef. The men often leave during the day to fish from Lake Victoria, while the women haul water from the lake, 2 miles one direction, to water crops in the dry season. The lake is a blessing and a curse for these people: the water isn’t too clean and has bacteria and parasites living in it. Men are often lost while fishing; either drowning or to a resident hippopotamus or crocodile. Still, the village does not suffer with drought as other villages in rural Tanzania do.

With the arrival of concrete, Sukuma architecture has changed slightly. Shallow foundations are now



Fig 2.17 Modern version of Sukuma Dwelling - little light or air is allowed in

being used, along with cement slurry in the adobe brick. However, because the villagers do not quite understand how to properly reinforce concrete, they have to pour a “ring beam” for shear strength in every building. At the height of the door sill, a continuous beam of concrete is poured around the entire perimeter of the building, directly on top of the concrete/adobe bricks. The roof construction is either set on top of that and poured in place with more concrete, or the assembly is embedded into the ring beam. Roof assemblies are beginning to change as well. Shed roofs are beginning to gain popularity, along with the use of corrugated metal imported from Kenya and steel support members (instead of sisal) now available in

Mwanza. These light steel members are more expensive, but resist destruction by bumblebee and termite much better than sisal or wood. These concrete buildings are being built much like the traditional models, and with newer roofs, allow little light or air into the interior (fig 2.17). Buildings are often stifling during the day, and smoke from cooking discolors many walls because there is no ventilation path.

The village of Kitongo-sima may be rural, but the people are also familiar with western culture. A church implemented a rural birthing clinic not far from the village recently, and it has been a great help to many of the women in the community. The clinic does not offer services past prenatal and delivery and will only serve woman who are pregnant or giving birth. Mavuno village, a Christian organization, has purchased much of the unused farmland or fallow fields owned by Kitongo families to serve as a location for a family-centered orphanage. The village of Kitongo-sima is being pushed into the 21st century, and it is our duty to see that this advancement does not completely overshadow the rich traditional culture that these people enjoy.

[Project Information]



III. Site Information

The site of this thesis lies on the outskirts of the village of Kitongo-sima in Tanzania, Africa. The project will encompass a small medical clinic, and medicinal garden for use of the Mavuno Village orphanage, and nearby village of Kitongo-sima. It is expected to service around 60 people until the orphanage is fully finished. At that time, the clinic will likely be expanded to serve as many as 300 people. Figure 3.2 shows the site's proximity to the village. In this figure, the black dots represent village dwellings, or village owned buildings. The purple outline is the site of the orphanage, and the red dot shows the location of the site of the medical clinic. The site is situated with its back against the base of a large rocky hill and is located roughly 400 meters from the shores of Lake Victoria. This site is located on a natural bench between the hill's end and above the rocky, sandy soil located closer to the shore. It has soil which has a content of sand, dirt and morram (a red hard clay).

The program for the building is simple, and was developed with the help of Dr David McLaughlin of Bozeman, MT. Dr. McLaughlin has worked for years as a missionary doctor, and has served at many of Africa's major missionary hospitals.



Fig 3.1 A map of the Sukuma lands. The orange circle on the top left highlights the land detailed in figure 3.2

It will house:

- Entry area with reception desk, totaling apx. 200sq ft
- Large examination room, approximately 400sqft
- Small examination room, delivery area, apx. 200sqft
- Small laboratory (possibly), approximately 150sqft
- Nurse and doctor's station, approximately 150sqft
- Small infant care area, approximately 150 square feet
- Medicinal storage area, approximately 100 square feet
- 3 separate recovery rooms, each approx 100 square feet
- 1 bathroom, approx 100 square feet
- 1 small kitchenette/sleeping room for staff, appx 150sqft

The building envelope will be approx 1500 square feet.

The site will also be a home to a small medicinal garden, an exterior courtyard, and have room for displays about native plants and herbal medicine.

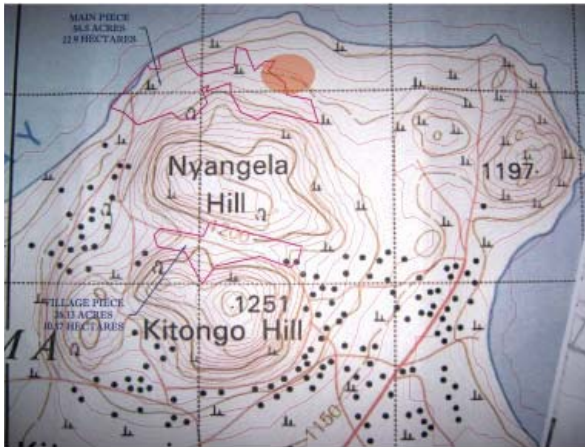


Fig 3.2 Topography of the small peninsula where the site is. Orange circle highlights the building site, shown in Fig 3.4

The site and situation of this project are restrictive: the building must be able to be built affordably, and must use mostly local materials. Any materials to be gained from the site should be used to help cut cost of importing cost. There is an abundance of manual labor for hire from the village, and the villagers have some men who are familiar with the use of concrete. This project is located on a major footpath that leads around the hill, and will have to guard against thieves and unwanted visitors. The site gets plenty of sunshine, and catches breezes from the west in the morning and from the east in the afternoon off of the lake.

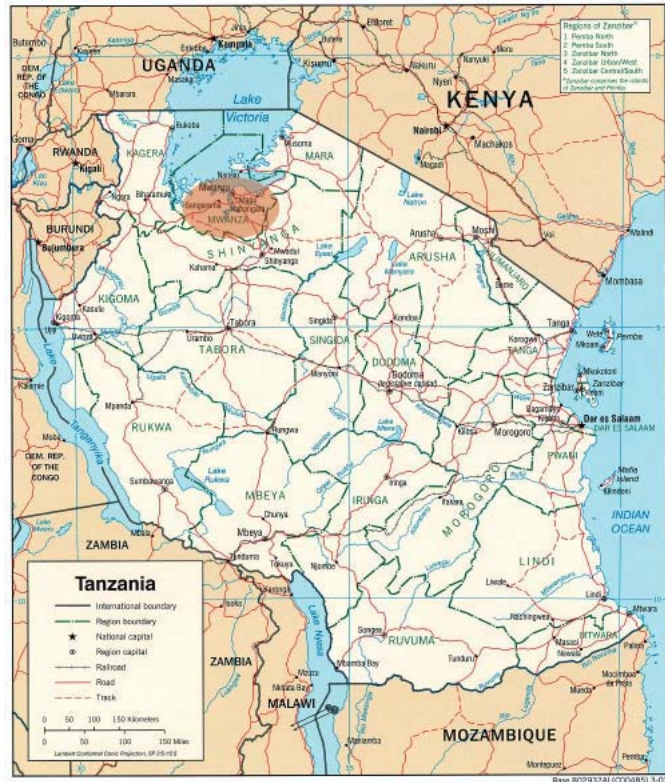


Fig 3.3 Map of Tanzania, in the north lies Lake Victoria. The orange circle highlights the Sukuma land, shown in Fig 3.1

III. Project Information



Fig 3.4 Roofplan

this position was chosen for the building because of the drainage patterns. The widest part of the natural bench offers a fairly level surface, and the deep ravine to the west drains water away from the bench. The building was situated fairly close the access road



Fig 3.5 Perspective

The building's form was derived from the single shed roofs that top many of the "modern" huts in Subsaharan Africa. While this is not "historic", it is a fact of current construction, and a design that can use some improvement. These huts are built with no windows, one door, and no room for circulation. The huts become ovens in the day, with the metal roof absorbing energy from the sun, and little air circulation to offer any relief. The single shed roof is a good shape for gathering rainwater, and does have the potential to encourage airflow throughout the building if constructed properly. The project's form is also derived from the housing typology of the courtyard building, often found in tropical climates. A courtyard house is centered around a central green space, and roof forms encourage the air to be drawn through the oasis in the center of the building through the living spaces.

III. Project Information

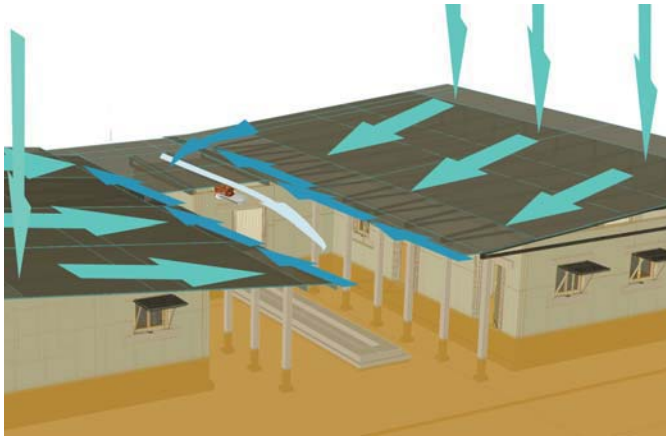


Fig 3.6 rainfall diagram

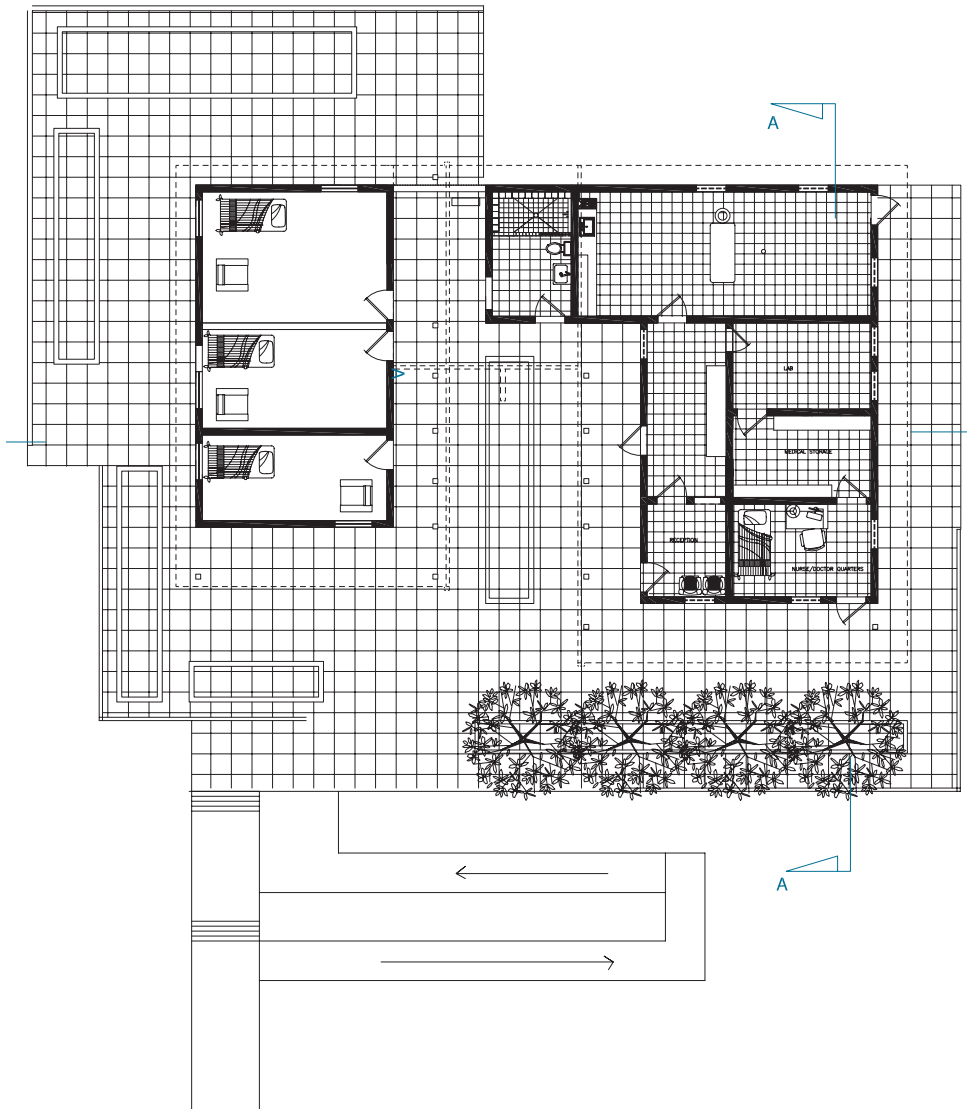


Fig 3.7 ventilation diagram

The medical clinic was designed as an interpretation of the traditional courtyard design. The building makes up three sides of the central courtyard, while trees and vegetation make up the last side. This vegetation wall will help draw air into the shaded courtyard. The courtyard is shaded by long overhangs, and has a cachement pool in the center to catch rainwater. Air is drawn through the vegetation to cool it initially. The air then travels over the cachement pool to cool the air further. The cool air is drawn under the deep overhangs, and through the building to the higher eaves on the outside of the building.

Rainwater is collected on the slanted roofs, and channeled through bamboo gutters to a scupper. Rainwater is deposited into the cachement pool, and when the cachement pool reaches capacity, the spillover is collected in a cistern below the pool.

The layout of the medical clinic was fairly straightforward. The more public areas (reception, nurse's station, exam rooms) are kept on one side of the building. The patient rooms are kept separate by the courtyard, and include a nice flex-space for sitting or gathering. This flex space is walled in by a bamboo wall to encourage air passage through the space. Both the private and public sectors have deep shaded porches for sitting, or gathering. In the Sukuma culture, there is no concept of a 'waiting room'; it is hoped that these shaded porches will allow for a more culturally appropriate space to await treatment, or news of a family member.



III. Project Information

materials

bamboo



grown on site, near to the lake. can be cut and formed for reinforcing for concrete using only a machete and some warm/hot water. Is covered with tar before being used as reinforcement.

poured earth block



made from plaster of paris, earth from the site, and portland cement. cast in a CMU press on site, cured on site, installed with mortal. Low cost, skilled labor is available locally.

corrugated steel



available locally, used by locals on houses and commercial buildings. Will shed water fro water collection, can be cleaned or treated of sanitary issues. Can be easily replaced and repaired.

site made brick and tile



made from cement, and aggregate from the site. used as paving, and sub-floor for hardwood surface



tile made from earth, clay and cement. formed, poured, cured and/or baked on site or locally

eucalyptus



grown locally, available from village planed and ready to install.

fabric screen



available locally, a non metal screen, can be treated with peremethrin, a natural insect repellent. Can be bolted into windows for window screen.

Fig 3.9 materials used in project

Materials were chosen for their local availability, and their sustainable qualities. Materials that could be gathered or grown on site were given preference to those that had to be shipped or trucked in. Steel trusses were chosen for their bee and termite resistant properties. The eucalyptus, site made tile, and earth blocks also serve to visually and cognitively tie the building to the site, giving it a sense of place. Window screens (as well as the screens that cap the roof structure) are built from local lumber, bolts and fabric screen. The fabric screen can be re-treated to repel mosquitos, and the bolts can be reused when the wood needs replacing.

construction process

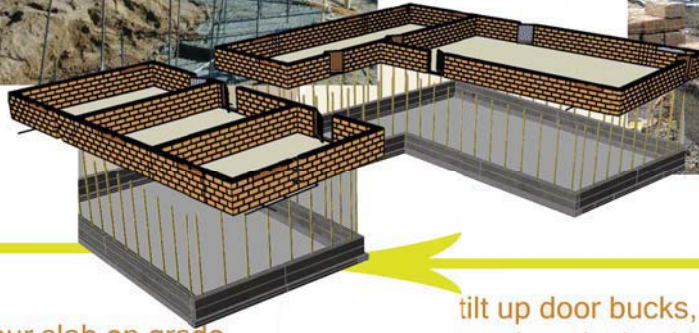
dig footing trench



pour footings, reinf with bamboo



begin stem wall with thick mud to make level



tamp earth



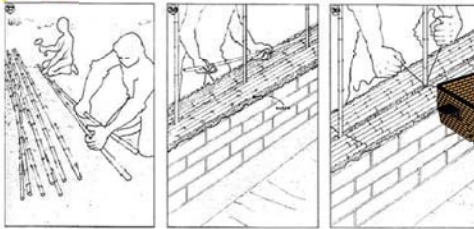
pour slab on grade



tilt up door bucks, continue laying block



every four courses, use bamboo as reinforcing. tie with wire or nylon



pour ring beam



raise and bolt truss

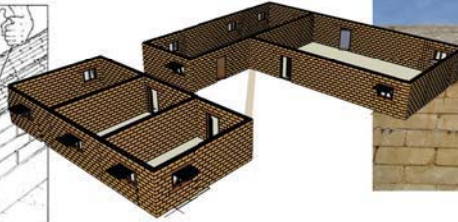
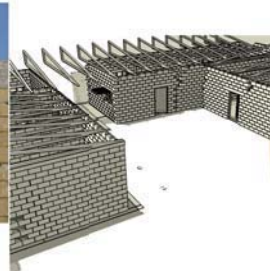


Fig 3.10 construction process

III. Project Information

systems

solar hot water system
cistern gravity fed from water
tank up on hill. Treadle pump
is used to pressurize, and pump
water up to solar tubes. Water is
gravity fed to shower

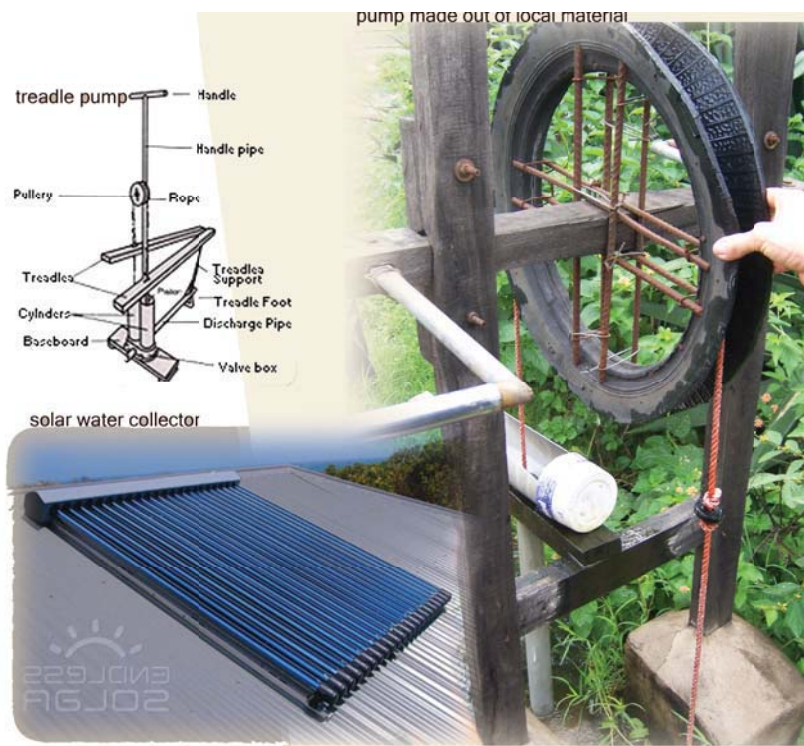
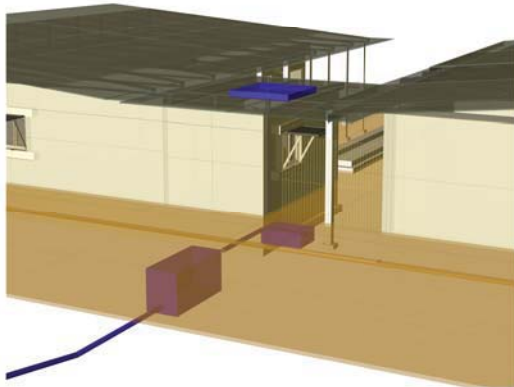


Fig 3.11 systems

A passive hot water system is employed to provide warm water for showering. A propane stove inside of the exam room offers a way to boil water and sterilize instruments for the doctor. Water is pumped from a filter tank on the hill to a small holding tank. A treadle pump is used to pressurize the water, and to send it to the water tubes on the roof. Water is then drained by gravity to the shower and sinks. A hand pump can be used as well. A small pump can also be used with the cistern under the pool in the courtyard. This water can be used to water the plants around the building, or boiled for use in other areas. In the future, photovoltaics will be installed to provide energy to the whole building. These will not be installed until a grant is available to help purchase them.

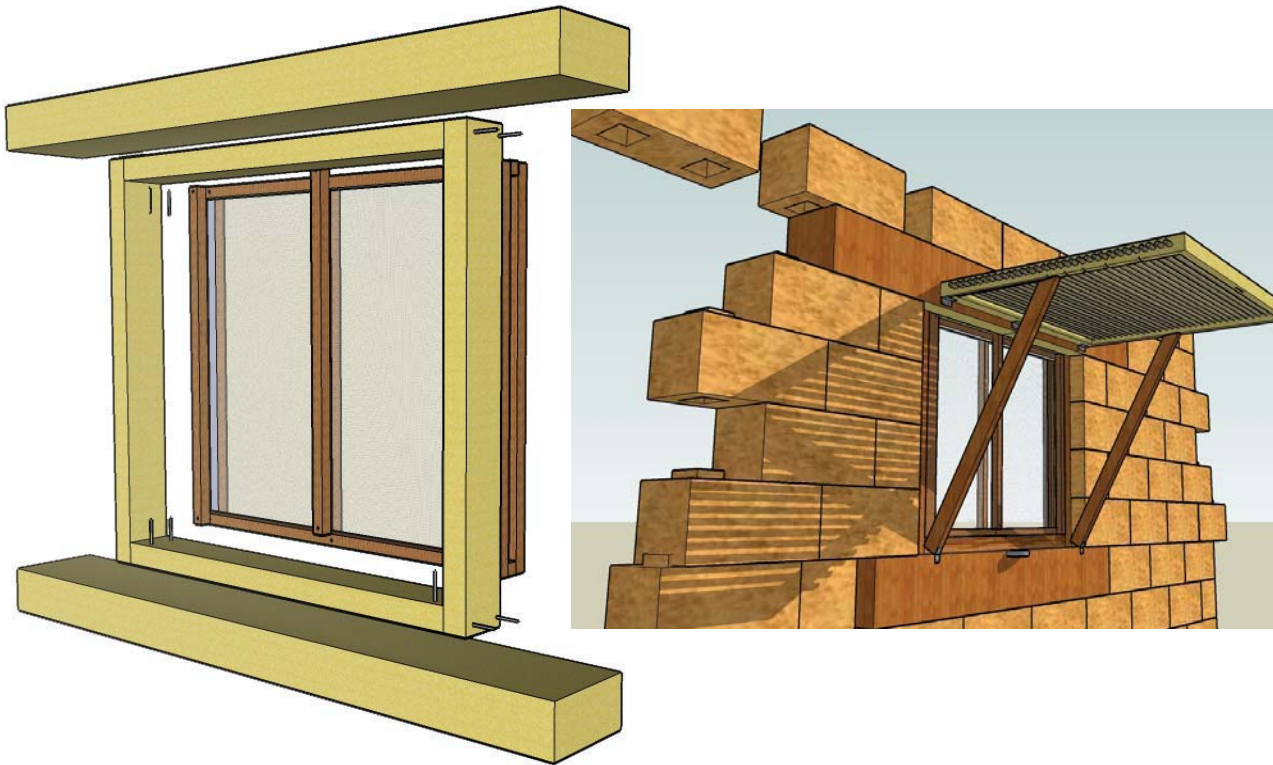


Fig 3.12 window construction

Windows are constructed of local lumber and fabric screen. Window lintels are cast on site from concrete, and installed when the block is installed. A window shutter is constructed of bamboo and local lumber. The screen can be closed in inclement weather, and opened to provide shade during the day. Glass is not installed in the windows at this time, though it may be a future modification.

The building was designed to harvest rain water and fresh breezes, to basically become an oasis in the African savannah. It is meant to be a tranquil environment that encourages healing.

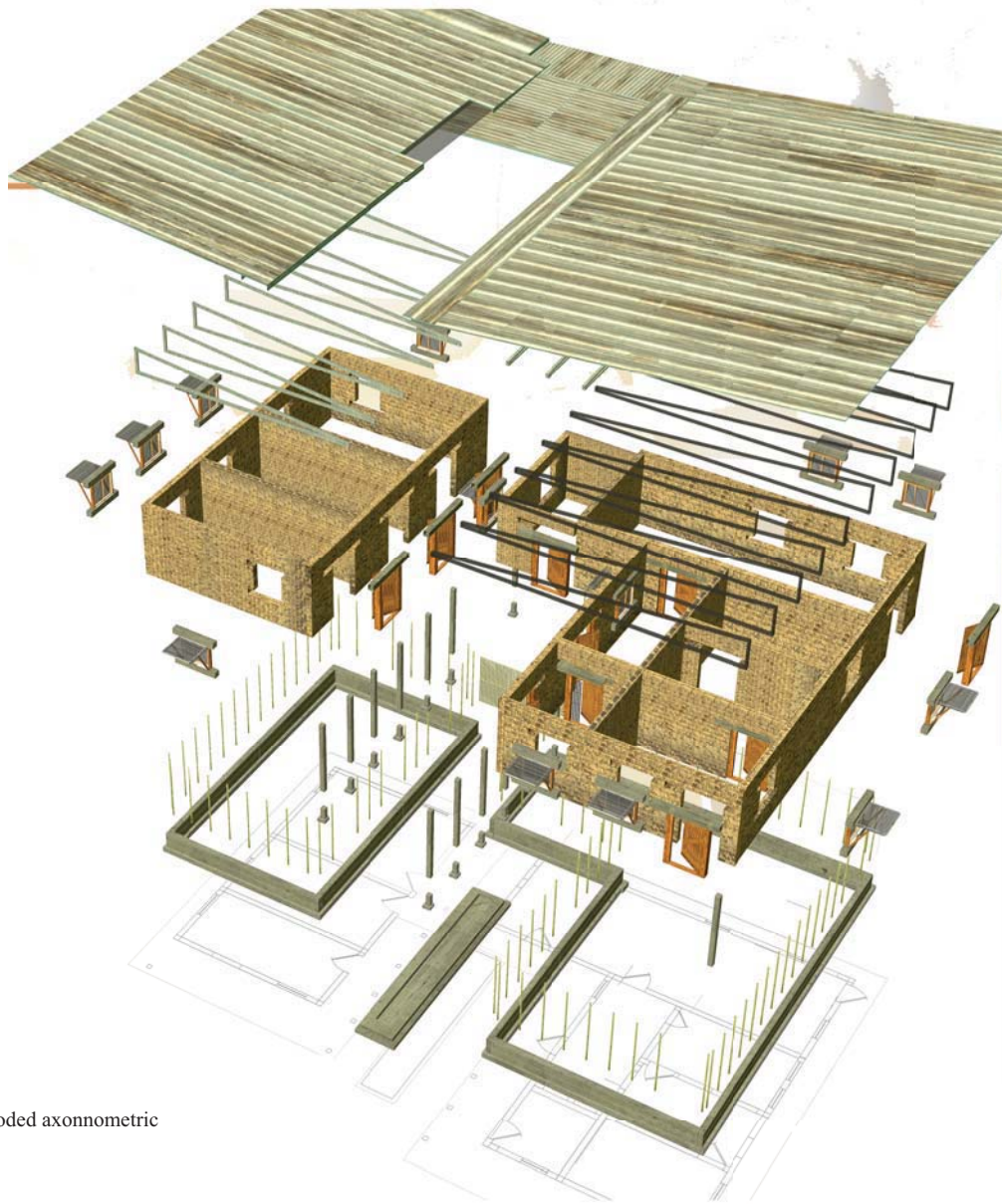


Fig 3.13 exploded axonometric



Fig 3.5

The concept of Mavuno Village started as an attempt to help the growing number of children who have been orphaned by the AIDS pandemic. Mavuno Village's mission is to build a Christian family-style village supported in part by farming, which will teach the biblical values of family as well as equip the children with skills for their future.

Mavuno will hire families who have few children, or have been unable to have children. These families will adopt orphans of Mavuno Village, and raise them as they would their own children. These families will go through a rigorous selection process, and have both a father and a mother. One of the parents will work outside of the home on the Mavuno Village land, or in the school to supplement income, and to show children the value of holding a consistent job.

The goal is to remove the traditional thought of institution from this orphanage. Children will be raised with cultural awareness, and a secure family environment.

Fig 3.6





[Sustainability]



IV. Sustainability

Looking to traditional architecture reveals that fully sustainable architecture is not only possible in these regions, it is necessary. Many of the people still living in the bush and in the suburbs of cities cannot afford to maintain a building that wastes energy. Many of people, even located within the limits of Mwanza, Tanzania's second largest city, live in traditionally constructed houses with no electricity or running water (fig 4.1, 4.2). If all of these people begin to move into energy-guzzling buildings, think of the strain on the natural resources in the area, as well as the world. Walter Youngquist, a writer for the *Geotimes* warns:

"Should everyone in the developing countries use the same amount of energy as the average consumer in high income countries does, the developing countries' energy use would increase more than eight-fold in the next 50 years. And where would the energy come from? The International Energy Agency says the world will need almost 60% more energy in 2030 than it did in 2002. At the same time, oil industry experts estimate that current reserves will only last for about 40 years, and the accessible reserves of coal will also be consumed within the foreseeable future."⁴⁵



Fig 4.1 Typical family and twelling in Kitongo-sima

In the end, sustainability should be valued not only as a way to save resources, but for its health benefits for the inhabitants as well.

Circadian rhythm is defined as 'a body's natural daily rise and fall of energy, often coinciding with natural progression of daytime'⁴⁶. To create a building sensitive to environment could also be an opportunity to keep inhabitants directly connected to their environment. Many 'westernized' buildings become large concrete towers with windows only along the periphery; not all workers get to see daylight during the day. This disconnect actually impacts the society's pride in, and care for the natural land that they live in. As Leopold laments in *A Sand County Almanac*, "we grieve only



Fig 4.2 Shops and homes in Nyangugue, a town near Mwanza

what we know.”⁴⁷ People’s concerns begin at home, with their environments, the networks of meaning with which they are daily engaged.⁴⁸ If people become disconnected with the daily cycle of their environment, it will slowly cease to matter if it exists at all. Not only do these ‘bunkers’ prohibit the communion with the passage of time, but inhibit the free and healthy energy provided to us via the sun. Gregory Kiss, principle of Kiss+Cathcart Architects goes so far as to challenge:

“Why not address the long standing disconnect – even hostility- between modern architecture and the environment? We clad buildings in opaque skins that reject daylight and absorb heat, while inside lights burn, creating more heat that is blown outside

by air conditioning units, which are oversized to carry off the heat they produce themselves. The skin of the building should instead gather as much energy as possible and direct it to where it is most needed.”⁴⁹

This quote points out that the skinning of modern buildings can be good illustration of man’s quest to dominate the natural world through modern architecture rather than work with it (fig 4.3). If much of the developing world is allowed and encouraged to follow through with westernization, we are at risk of losing all cultural heritage, and what little natural resources we still possess. That is, if Africa develops as America has: with a disregard for climate, site, and energy consumption. In *Understanding Sustainable Architecture* Helen Bennetts states:

“modernists unapologetically maintain that globalization, scientific rationality, and technology are the most important elements of any context in this day and age; climate, history, and topography must be dealt with, of course, but they are easily dispatched. This attitude,

IV. Sustainability

simply put, is what it means to be modern.”⁵⁰

It is essential to begin the process of changing the mentality surrounding architecture in this part of the world. Just as these people have lived in harmony with nature for thousands of years, they must continue to do so, even as they enter into the ‘modern’ world of architecture. A rapid change to fully energized idyllic modern buildings is out of the question for a majority of the developing world; nor is this desirable. Instead, to invent a new form of modern architecture that is accepted world-wide as a peer to modernity should be ideal. In addition, a more gradual roots-based change will be more widely accepted by the inhabitant. Helen Bennetts also points out that “neighbors share our own cultural horizons, change is slow, and building forms, culture, and environmental changes move in step.”⁵¹ This will mean looking not only at sustainability as an environmental concern, but also a concern of culture and technology; seeing the term of sustainability as all encompassing.



Fig 4.3 A row of shops outside of Mwanza - designed without windows or ventilation. These buildings are relatively new, and are deteriorating



Fig 4.4 Stelehe Orphanage in Tanzania uses locally available black tubing to pre-heat water for washing. This uses solar energy, and saves valuable electricity for other uses

Nature – Contrary to popular belief, the term ‘sustainable’ is not used only in reference to the protection of the physical environment and natural resources of an area. Environmental sustainability’s popularity as a term, as a fad, and as a marketing ploy outside of design circles should not overshadow its necessity, but it is important to realize that natural sustainability is just one issue in the broad spectrum of complete sustainability in the context of the society. Human beings are at the center of sustainable development. Humans are entitled to a healthy and productive life in harmony with nature.⁵² This can be achieved simply through an awareness of design choices – who they affect, why they affect them, and how these affects can be minimized or eliminated. The simple

use of passive energy is used in traditional architecture, but is not often articulated well enough to be carried into future buildings. Traditional inhabitants of the area had no choice but to use the passive techniques. Naturally occurring wind, solar and water were used to heat or cool. While traditional inhabitants assumed that future generations would understand and use the same technology, younger generations may not understand the considerations that were made in constructing traditional dwellings because of modern conveniences made to override nature’s challenges like air conditioners, and ventilation fans. By confronting the challenges presented by passive and active engagement with the environment, architects have the opportunity to create new forms and reinterpret traditional models.⁵³ Studying the natural energy on site is essential, and all too often overlooked (fig 4.4). In McDonough’s Hannover principles, he states

“Rely on natural energy flows. Human designs should, like the living world, derive their creative forces from perpetual solar income. Incorporate this energy efficiently and safely for responsible use”⁵⁴

IV. Sustainability - Nature

This could be achieved as simple as letting ambient light into a building. By calculating the sun's angle and azimuth, architects can simply and effectively block direct sunlight. Because African homes rarely, if ever, need heating, these shades and overhangs can be used year-round. Deep colonnades and walkways are good ways for encouraging natural light without letting the heating rays penetrate the space. Capturing natural energy can be passive, or active; Solar energy is relatively easy to capture and use with photovoltaics. A company out of Florida, USA (with offices in several major European cities), Aerotechtecture makes low-wind speed wind turbines. They are a slight increase in cost from typical small-voltage-producing turbines but these are soundless, vibrationless, and prevent birds and animals from getting caught in them.

For passive application, wind can be captured as cooling simply by studying the wind patterns for the area and encouraging cross ventilation; this also helps to clear the air from cooking smoke. Many areas of African do not have enough running water to consider hydro-electric power at this time, but there are a few projects being considered for the Lake Victoria area's future use.

Using local materials can save much impact on the environment (fig 4.5). If there



Fig 4.5 Local materials (twine, simple rubber stops, metal pieces) make up this hand cranked pump. The twine has knots in it with rubber stops tied to them, which are pushed into a pipe to trap air. This creates enough pressure in a cistern to push water up into the spigot.

is a cement factory near, and people are aware of the correct process to mix and pour cement (fig 4.6), it can be considered for larger-scale construction.

Traditional materials often still work if re-evaluated, and reinterpreted: adobe, stone, clay, brick, and plaster are all excellent building materials. Often, locals grow crops as 'living fences' that can be used in the building process. Sisal and bamboo are often grown for fences, and eucalyptus trees are often very plentiful in the sub-Saharan region. All three of these materials have enormous potential in the building industry. Bamboo and eucalyptus are fast growing, easily regenerated,



Fig 4.6 When cement is constructed correctly, it becomes a fine material for building in this region.

and have been used with success as flooring and paneling in the US. Sisal is thick and reedy, readily grown in every climate, and excellent for use as lattice, gates, fences, and shading. Papyrus reeds are very similar to sisal, and grow plentifully along the shore of Lake Victoria. Sugar cane is a very popular crop in parts of sub-Saharan Africa. Gerald Risowski, a scholar specializing in innovative building materials in rural or third world countries recently did a study on the effectiveness of sugar cane as a rebar stand-in in rural cement construction⁵⁵. And while many of these villages and cities do not have the machinery required to make rammed-earth, there are several soil/plaster/cement mixes that use local soil to make walls very similar to

rammed-earth. Straw bale construction is being explored, although its resistance to termites makes it difficult to use in some areas. The red-cross will also send bales of waste-T-shirts to any country in Africa⁵⁶; usually these bales are dismantled and sold for profit. However, these bales have been used recently in humanitarian building: they act well as insulation, and create structurally sound walls quickly and easily. No matter what building materials are used, the underlying message is the same. People should be living in buildings made of natural materials, with a connection to the world outside. Jason Frederic of BNIM Architecture idealizes this in *Architecture White Papers*:

“a living building will
harvest all its own water
and energy needs on site;
Be adapted specifically to
site and climate and evolve
as conditions change;
operate pollution-free and
generate no wastes that
aren’t useful for some other
process in the building or
immediate environment;
promote the health and
well-being of all inhabitants,
as a healthy ecosystem
does; Be comprised of

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integrated systems that maximize efficiency and comfort; Improve the health and diversity of the local ecosystem rather than degrade it; Be beautiful and inspire us to dream"⁵⁷

This approach to architecture responds to, instead of alienates, the local tradition of health and wellness. Locals characterized health in terms of a harmonious balance between person and environment. The person was thought of as an interaction of physical, mental and spiritual ingredients and the environment included the living environment, and social environment.⁵⁸



Fig 4.7 Charcoal is often used to cook with in this region. It is not sustainable, and used only because other methods are not readily taught or available.



Fig 4.8 Fishing is a vital cultural interaction for the village. It provides families with food and money, and gives the men a social outlet

Cultural-- The social environment is as important as the natural when studying the true sustainability of a building. If a building does not support or improve the culture (fig 4.8) in which it is placed, it is a waste of space. In an area of the world where many cultures are threatened with the loss of culture because of westernization and loss of many family members to AIDS, it becomes especially important to reinforce local traditions. In *Architecture: Meaning and Place* Christian Norberg-Shultz warns that

“In general, the loss of things and places makes up a loss of ‘world’. Modern man becomes ‘worldless’, and thus loses his own identity, as well as the sense of community and

participation. Existence is experienced as ‘meaningless’ and man becomes ‘homeless’ because he no longer belongs to a meaningful totality. Moreover he becomes ‘careless’ since he does not feel the urge to protect and cultivate a world any more.”⁵⁹

It is arrogant for westerners to assume that there is nothing in African heritage worth saving. Again, it is due to the incorrect view that Africa is a proverbial sponge: simply soaking up the culture from imperial countries, with little merit on its own. It is a danger to let these cultures slip away before we can discover the knowledge and merit that they own. A good illustration is medical care in modern day sub-Saharan Africa.

“One look at an African hospital pharmacy reveals that Africans are being treated the European way only. No cognizance is taken of the vast wealth of knowledge of health matters accumulated over centuries in Africa itself.”⁶⁰

It is time to recognize regional and

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cultural differences in architecture – even in developing countries. These changes can be inspired by adopting a driving theory called *critical regionalism*. Critical Regionalism was a term originally used to draw attention to a movement working towards an alternative to postmodernism.⁶¹ In Alexander Tzonis' words "critical regionalism is a more original movement...a response to new problems posed by contemporary global development".⁶² Kenneth Frampton goes so far as to proclaim that

"This threat is expressed, among other disturbing effects, by the spreading before our eyes of a mediocre civilization which is the absurd counterpart of what I was just calling elementary culture. Everywhere throughout the world, one finds the same bad movie, the same slot machines, the same plastic or aluminum atrocities, the same twisting of language by propaganda, etc. It seems as if mankind, by approaching en masse a basic consumer culture, were also stopped en masse at a sub cultural level."⁶³

Instead of following the postmodern ideal with



Fig 4.9 a pile of local and site-made materials sits on a future building site

seemingly arbitrary adornment, critical regionalism encouraged a deeper understanding of the region, the culture and the people; it focused on celebrating the things that made each community different from the next, the identity of a place. The architects responsible for coining the phrase explain the need for the movement as "...the reason for this has to do with the ubiquitous conflict in all fields between globalization and international intervention, on the one hand, and local identity and the desire for ethnic insularity on the other."⁶⁴ First one must fully understand the culture in which you're building. Then, study and re-interpret



Fig 4.10 an icon for the Sukuma culture - this round building is the traditional form and ornamentation used for churches

traditional building materials, and community icons (fig 4.10), along with appropriate new technology or techniques.

“It [critical regionalism] selects these regional elements for their potential to act as support, physical or conceptual, of human contact and community, what we may call “place defining” elements, and incorporates them “strangely” rather than “familiarily.” In other words, it makes them appear distant, hard to grasp, difficult, even disturbing. It disrupts the sentimental “embrace” between buildings and their consumers.”⁶⁵

In the end, you have a building that feels like it is an essential part of the native fabric, while avoiding

simply replicating historic buildings. Critical regionalists know that it is a fine line between emulation and inspiration. Kenneth Frampton warns against this

“It is necessary to distinguish at the outset between critical regionalism and the simplistic evocation of a sentimental or ironic vernacular. I am referring of course, to the nostalgia for the vernacular which is currently being conceived as an overdue return to the echoes of popular culture”⁶⁶

An architect should look at: what are the local-made building materials (fig 4.9), what are the traditional housing forms for that ethnic group, what are the popular building materials that are imported, how are they used? What plants do people generally grow and use? How do people generally get their water? Is the town centralized or spread out? Does the culture have a major export crop? Do the inhabitants hone any special skills that may be used in the building process, or as inspiration? These questions, although they seem basic, are rarely asked when beginning a project in a third world country. More often than

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not the mentality becomes to 'provide shelter' in developing countries and that somehow the function of 'shelter' mutually excludes aesthetic or cultural sensitivity.

Critical regionalism invites us to analyze current building practices, traditional building practices, regional and local labor forces, talents, regional and local labor force, local climate, and encourages the use of these elements. It also encourages the re-invention of these materials and ideas; this idea is core to the ideology. Critical regionalism does *not* promote culture wash: simply pasting on a traditional iconic form to an otherwise culturally ignorant building and calling it 'regional architecture' (fig 4.11). Instead, critical regionalism inspires research into *why* the traditional forms are the way they are – are they meant to pull air through the building? If so, could they be made of another local material to improve ease of maintenance? Is the traditional shape really the most efficient? Could it be re-interpreted somehow to improve performance? Critical regionalism inspires buildings deeply connected with site and culture, not as Elizabeth Bennetts states in *Understanding Sustainable Architecture*

“...[there is a wrong] assumption that a global building designed elsewhere



Fig 4.11 a cross between traditional and concrete -- critically regional or culture clamping?

can be clamped limpet-like to a local culture by using the 'right' materials, features, and gadgets appropriated from the vernacular.”⁶⁷

It is difficult to realize a critically regional building; to create a building that is culturally sustainable, instead of pasting culture onto a building. For example, in sub-Saharan Africa, many of the traditional dwellings have thatch roof supported by sisal pole grids, thatched together by sisal rope, or papyrus reed rope. Does this mean that new architecture in this area must also have thatched roofs; because of their cultural relevance, and effectiveness at cooling and ventilating? Of course not.



Fig 4.12 view from the site over Lake Victoria. This environment should be allowed inside of the building as well.

Instead, critical regionalism encourages us to investigate why the traditional vernacular developed the thatch in the first place. Research tells that thatch was easy to grow, easy to replace, and that it was readily available. It also does not transmit much heat into the building, while allowing a light breeze to take smoke away. Those are all impressive qualities, but thatch allows animals and insects to live in the roof of the building, and moisture encourages mold growth. Instead of *making* a roof from living material, a roof could instead be built out of another locally available material (like locally made slate tile or concrete shingle), and create a living canopy to discourage the sun's direct glare on the roof. The same thought could be given to any number of building components in this region of the world. We don't want to *replicate* culture, we want to *sustain* it. Encourage culture to thrive, flourish, change, and grow.

A critically regional building should *feel* like it belongs on the site. In the site of Kitongo-sima, a building

should allow the cool breezes through the entirety of the envelope. Because many of the walls in the village are constructed using adobe or rock, smooth walls might seem out of place. Instead, a wall with an inviting texture similar to traditional vernacular would be best. Not to say that it must be made of the same materials, but that it must recall the same feeling when running a hand over the wall. The building should feel as if it is part of the site. Inhabitants should be able to hear the fish eagles while they fly overhead, or smell the thunderstorm rolling in over Lake Victoria (fig 4.12). The building while being open and sensitive to the environment must also feel safe. Safety is a large concern for rural people, and new buildings must be able to be locked if they are to deter thieves. If nothing else, an outside wall can be made of thorny bushes or stone to further deter pedestrians from becoming opportunistic thieves. These are all essential pieces of critical regionalism as well. Critical regionalism does not stop at form and material choice, but continues on to address smell, sound, and tactile feel.

Dwellings in the village of Kitongo-sima are surrounded by trees, crops, living fences, goats, chickens, cows, and children. In essence, these buildings should feel like

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they reflect the life that goes on around them at all times. The building should not feel static, but rather a dynamic and living part of the community's culture.

Buildings could also become educational tools. New construction methods like the correct use of concrete, site analysis, or passive orientation could be taught to younger members of the society, and these skills could then be used to make a living constructing buildings for other cultures. This would help to spread not only knowledge, but the opportunity to use this knowledge to make a living.

Architecture could be a tool in other ways as well. If a building were built with elements of traditional architecture, it would be easy to explain to inhabitants what parts of the building were inspired by local culture. It could become a source of pride, a piece of community to be preserved and taken care of. Architecture could begin to teach the culture about their own heritage. Sadly some people who use the building may not have as much knowledge about traditional building as the architect, and may be able to learn something from its construction to pass on to their own families. It is important to not only construct these buildings to be part of the community, but educate the community about it as well. "...to facilitate African people



Fig 4.13 students are required to work repairing the school and growing food for the teachers during part of their school days

in valuing what they know, and relearning what they knew before; this would mean spreading genuine local knowledge"⁶⁸, as Dr. Hans Martin Hurt encourages.

In the example of the rapidly declining healing and traditional medicine culture, buildings could be built allowing for small medicinal gardens out front. An elderly and knowledgeable person from the village could help select, plant, and tend the garden for a bit, until everyone in the building understood the plants and what they could be used for. School children often are recruited to help garden and farm at school (fig 4.13). It would be a wonderful place to start medicinal gardens to help pass on a knowledge that might otherwise be lost. Not to mention the health benefits that the children would have on hand, instead of having to travel to



Fig 4.14 bamboo would be a useful addition to a medicinal garden. It can be used for healing, as well as building material.

purchase medicine or wait for it to be delivered. Rather than having to suffer with ailments due to lack of money for chemical medicine, some easy-to-treat illnesses could be taken care of at school by a nurse with natural medicinal knowledge. The children would then be able to bring that knowledge back to their sisters, brothers, and parents.

Each ethnic group generally has an art form that dates back thousands of years. Designing a building that either embraces that aesthetic, uses it in the building somewhere or giving an area to practice the art form would be very beneficial to the culture. The Massai are

known for their beautiful red checkered cloth, and giving the women a shaded community area in which to produce and sell this cloth would be a wonderful addition to any building in one of their villages.

So what would a regionally critical building look like in northern Tanzania? An example would be to study traditional wall structure: massive, often made out of adobe or natural material, constructed on-site by local labour. This wall could combine a new technology with a traditional idea and form a new concept of wall: a thick wall made of cast earth (a new technique that mixes small amounts of cement with plaster, and earth from the site to create a strong building material with a look similar to rammed earth). The wall would be “of” the site, with the familiar weight associated with walls in the region, but would not duplicate exactly a thick adobe wall. The building could be oriented so that prevailing breezes swept through long corridors (fig 4.15) or were drawn up stair wells to help cool the interior of the building. Studying the courtyard of a traditional dwelling would inform the viewer about proximity of gardens: they are located close to the house for ease of weeding, care, and protection. However, these plants also serve to cool air before it enters the house.

IV. Sustainability - Culture

Another critically regional decision could be the creation of a living wall that cools air before it is drawn through the space. The concept of courtyard could still be carried out, but instead of one level courtyard, one could argue that several stepped intimate courtyards could perform the same function: identifying personal space and providing an area for socialization and play. Rocks local to the site could be used to build these retaining walls, again tying the building to the site. The roof structure could be made in a similar fashion to sisal poles, only using thin steel members. Metal roofs can be used to collect water, but sometimes cause the interior to become very warm. Studying the effectiveness of thatch roof for cooling, one could be inspired to create a trellis that would hold vines or ferns in a living canopy to the roof. These plants would help absorb the heat, benefit from the direct rainfall, and shade the roof from direct sunlight. The possibilities are endless, critical regionalism does not impose a checklist for design – it is situational and site dependant. As Liane Lefaivre states, “critical regionalism not only alerts us through the poetics of its forms to the loss of place and community, but also to our reflective incapability to become aware of this loss while it was occurring.”⁶⁸

Cultural sustainability is a choice for some, but those who hold sway over design



Fig 4.15 deep overhangs help keep direct sun from entering building

choices in developing countries often take that choice away from the people of the country. Instead of encouraging complete westernization, we should encourage the richness and diversity that makes this world exciting. If one travels to Kenya, Nairobi should feel very different than Boston, Massachusetts. Travelers should be enveloped by the culture that they step into, and locals should be full of pride in their city; pride because their buildings reflect who they really are: their values, their arts, their knowledge. That is true cultural sustainability. As McDonough says in the Hannover principles: “Seek constant improvement by the sharing of knowledge”⁶⁹



Fig 4.16 Cellphones are gaining rapid popularity. Here 2 Masai talk on their phones while herding their cattle.

Technical—Even though it is important to look at local materials and cultural traditions, it is just as important to analyze where it would be appropriate to implement new technology. If the technology will be understood by the people using it, if there are people who know how to repair it locally, and if it can be easily taught, it can be a great addition to critically regional architecture. Developing countries often don't even have to 'catch up' to modern technology. They can adopt new technologies and tools from around the globe and use them in their own ways; skipping older and outdated methods. According to *Worldchanging*, "surprisingly often, developing countries try out solutions that have yet to take hold in industrialized nations, we call this process

leapfrogging".⁷⁰

An excellent example of this in Africa is cellular phone use. *Worldchanging* states that "mobile phones empower both individuals and communities; The more people who have them, the more useful one phone can be."⁷¹ Actually, in many developing countries mobile phones are acting as catalysts for economic development and innovation, and cellular phone use is growing faster in Africa than anywhere else in the world. Currently more than three times as many Africans have a mobile phone than have a land line. Kenya's mobile-phone-using population grew from 15,000 people in 2000 to over 6 million today (that's 1/6th of their total population!). But leapfrogging has more meaning than simply adopting high tech gadgets, for developing countries it means freedom—freedom to use the very newest technology and freedom from being seen as uncivilized. "Being poor or lacking access to established technologies can liberate individuals and communities to embrace the new, because they haven't poured money into the old."⁷² Very few parts of Africa have a land telephone system, it would be silly for them to string up hundreds of miles of telephone wire, just to have it replaced with cellular towers a few short years later.

Leapfrogging can also inspire innovation around something that we in America see as 'normal'. In May of 2005 one of Africa's largest cellular providers, Safaricom, introduced a service allowing subscribers to transfer airtime minutes to other subscribers via SMS text messaging. Because these minutes are worth money, and because Safaricom serves most of the mobile phone subscribers in Kenya, sending minutes became another way of paying for goods and services.⁷³ "In essence, Safaricom became the unofficial national electronic bank".⁷⁴ This means that Kenya may be the first country in the world to test how successful an electronic currency works, simply through the use of a gadget that many of us have on hand.

In many parts of sub-Saharan Africa, photovoltaics are gaining rapid popularity. Power-plant generated energy is unreliable, and the power lines often go weeks without being fixed if they are downed. The clean and easy use of photovoltaics seems like a blessing to many who live far from a town center. However, few understand how to repair or maintain solar arrays. If the building were to change hands, would the new owner understand how to operate and maintain the array? New technology should always be considered: it is a mark of the developing country taking steps into the future.

However, putting technological gadgets into a building, simply to have people show it off (with no real idea what it does, or how to use it) defeats the purpose and the cost of getting it there. Instead, informing inhabitants about technology: how it is used, how to maintain it, how to repair it is extremely important. Many small wind turbines are easy to import, easy to install, and easy to maintain. Just because Africa has the ability to leapfrog into the 21st century, it doesn't mean that we should overlook the traditional passive techniques or the low-technology solutions that are just as. This is in no way suggesting that we should hold back technology from sub-Saharan Africa. As computers become more and more prevalent in the sub-Saharan, it is not hard to imagine computer-regulated operable windows systems on larger buildings. It is just essential to analyze the capability of the users of the technology. Education can be a powerful tool, and it needs to be used if implementing new technology.

[Case Studies - Critical Regionalism]

V. Sustainability - Case Studies

Bringing together the consideration of natural, cultural, and technological sustainability can be quite a feat anywhere in the world. It is critical to analyze those buildings which have achieved a measure of success through critical regionalism, and understand *why* the project is successful.

Alvar Aalto's Saynatsalo Town Hall in Finland is one of the most well known critically regional buildings in the world. Lefaivre and Tzonis applaud Aalto's building for being "unabashedly tender towards the new town of 3,000 inhabitants ... in an area fought fiercely over and strongly damaged by the Nazis...it tried to achieve a sense of belonging and community."⁷⁵ Rather than Aalto's pre-war use of pristine white stucco, this project explored brick, copper, wood, and abruptly varied roof shapes to respond directly to the genius loci.⁷⁶ The roof shapes create a jagged landscape against the background of closely planted trees and closely wooded landscape of Finland. The unusual layout of the collection of buildings also is a direct response to the culture. Instead of a grand monumental central building, "offices, council chambers and library are broken down into separate homey elements and grouped around a central public space."⁷⁷ The central courtyard is the entry point for every part of the Town Hall, and was created using dirt excavated for the

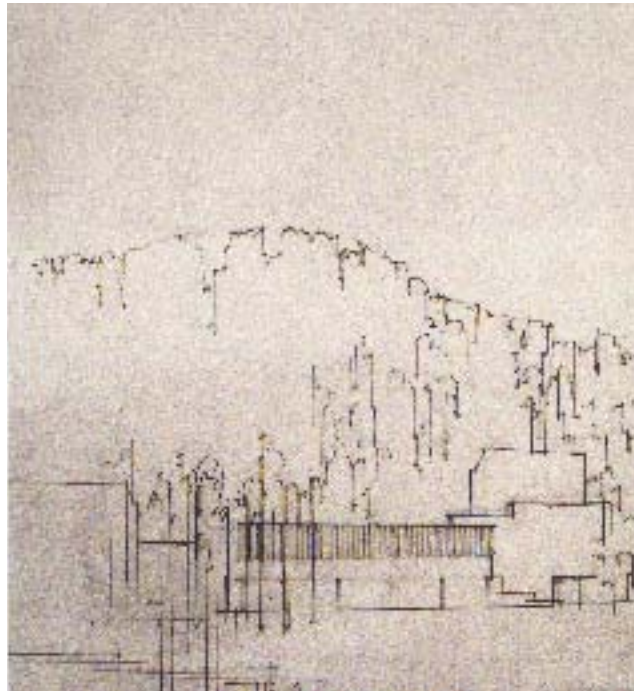


Fig 5.1 Alvar Aalto's building is one of the most well known examples of critical regionalism

buildings foundation. It responds to the site directly, allowing views of distant lakes and the penetration of the low northern sun. The building steps gently down the hill in response to site changes, so that inhabitants still experience the site, even when in the building. It is a building of its site and people, and Lefaivre states that "humble as it is, this project has gone down in history as one of the first examples of a humanized post-war architecture."⁷⁸



Fig 5.2

V. Sustainability - Case Studies

Renzo Piano's Tjibaou Cultural Centre in New Caledonia is also another very successful critically regional building. Renzo Piano worked closely with a social anthropologist to understand fully the traditions, history, environment, and religious beliefs of the Kanak. The result was a "new synthesis between local and global, tradition and modernity"⁷⁹ according to Lefaivre and Tzonis, authors of *Critical Regionalism*. Piano took European technology and expertise and studied how to best compliment the traditions and expectations of the Kanak people. It meant using traditional materials, building methods, and using natural site elements like wind, light, and vegetation.⁸⁰ The form of the cultural center was derived from the structure and functionality of Caledonian traditional huts. Ten huts make up the center, and are laid out like a village. Piano worked closely with specialist social anthropologist Alban Besna in deriving the configuration so that the huts would perform socially as well as they did environmentally.⁸¹ The center is composed of ten "huts", each a different size and height, and each with its own theme or function. Part of the site is devoted to cultural exhibitions, as well as an ampitheatre, and studios for traditional activities like dancing and painting. This project is an excellent example of taking the form

and function of a traditional dwelling and adapting it physically and socially into a new building. The project respects the past, and the site, but still is not a "pastiche replica of the past."⁸²

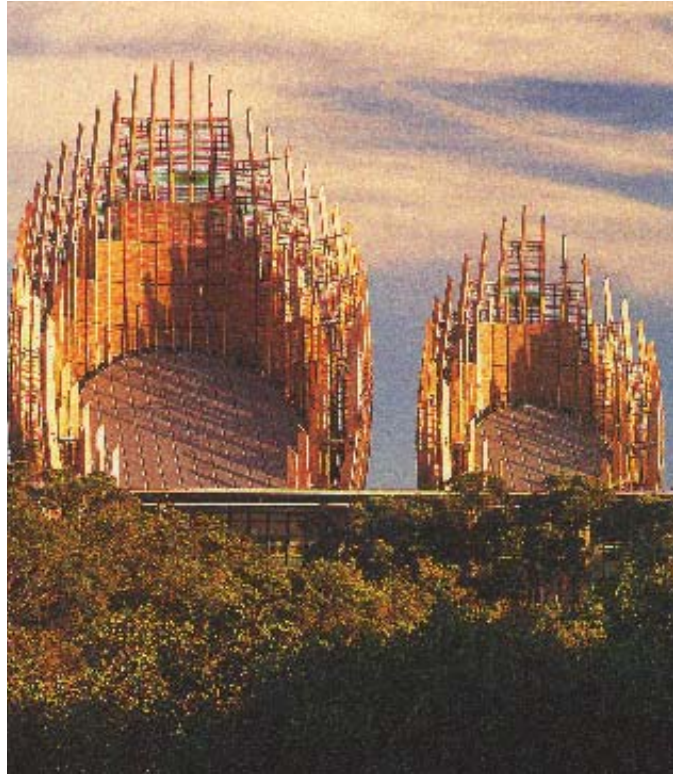


Fig 5.3



Fig 5.4

V. Sustainability - Case Studies

On a smaller scale, Samuel Mockabee's Mason's Bend Community Center shows how critical regionalism can be achieved through simple local material. Mockabee describes it as "a windshield chapel with mud walls that picks up on the community's vernacular forms and shapes."⁸³ Like the other buildings in the community, this community center is close to the ground, using a base of rammed earth. Its form recalls some of the old barns in the area: the red of the dirt in the walls, and the slant of the back side of the roof. But this project is hardly a trite replication of an agriculture building.

Andrea Oppenheimer, co author of *Rural Studio: Samuel Mockbee and an architecture of decency* writes that "the project's rammed-earth walls, pulled long and low suggest a prowlike form, supply heft, and the folded metal and glass roof provides the desired contemporary look."⁸⁴ The form was drawn in large part from the site itself, a triangular piece of land that connects the land of three of Mason's Bend's four extended families. The materials used are local, the rammed earth walls are thirty percent clay from site and seventy percent sand. The studio cut down cypress trees from a local farm to make the trusses by hand, and used left over timber to make benches for the interior. It even used community-specific waste as a building material:



Fig 5.5

eighty Chevy Caprice windshields were bought from the landfill and used instead of glass to help enclose the pavilion. As Adrea Oppenheimer writes, this project is "a work of avant-garde design perfectly at home in its rustic setting, a civic building created ... for people too poor to pay rent, [it] embodies Mockbee's admonition to act on a foundation of decency."⁸⁵

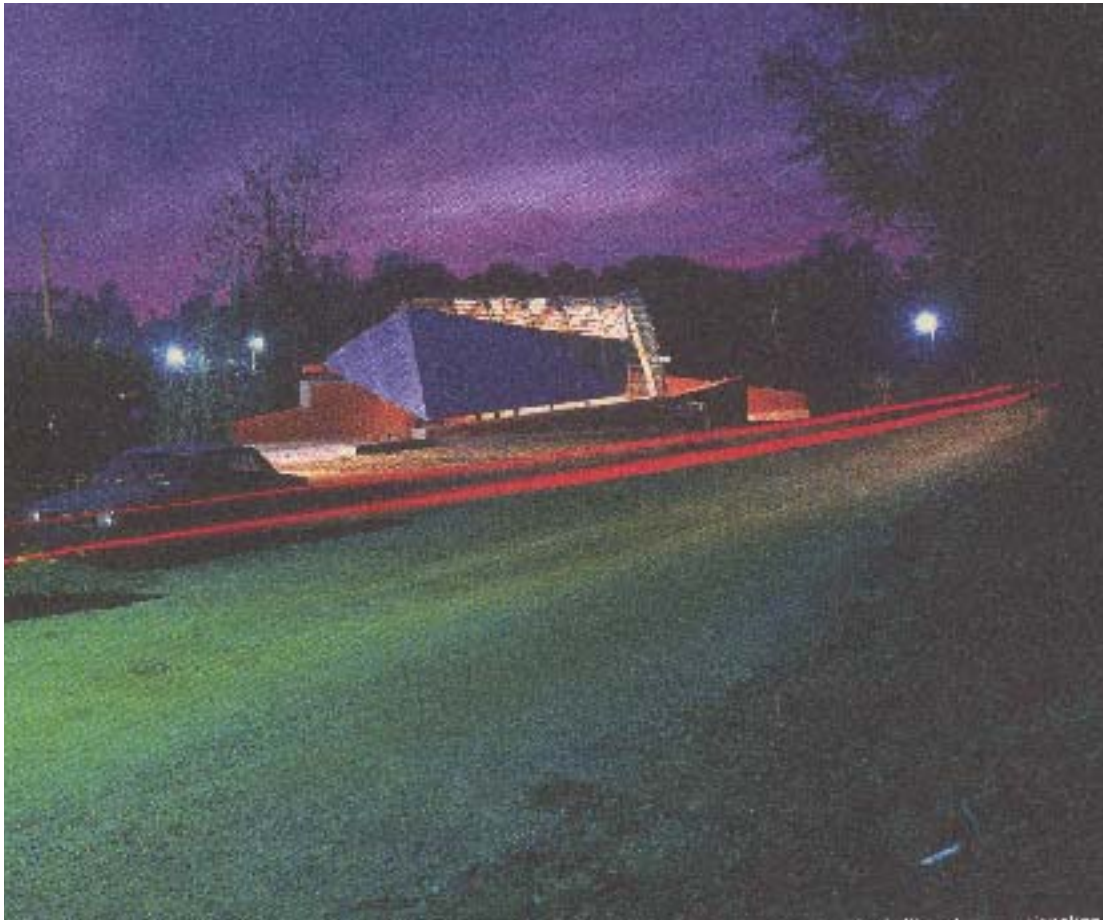


Fig 5.6

V. Sustainability - Case Studies

As mentioned earlier, sub-Saharan Africa is home to a good example of how critical regionalism can be adapted to the region.

Architect Justus Dahinden achieved a critically regional building in Uganda's Mityana Pilgrims Shrine. He says that his project "adapts to the climatic conditions as well as the local culture and in particular to the symbolic consciousness of African people."⁸³ The building is noted for its three spherical segments, meant to symbolize the three martyrs being honored by the shrine. The shape also recalls an ancient "Bantu building symbol of marked religious dimension."⁸⁶ The segments are arranged around a large common area in response to the social nature of religious practice in the area. The building used native materials: adobe and clay bricks, along with a modern material palate of concrete and glass to achieve a harmonious balance between modern and traditional. The architect saw the success of this project as "clear proof that the problem has not been with the architecture, but with the hesitation of trained architects to innovate with form and materials."⁸⁷

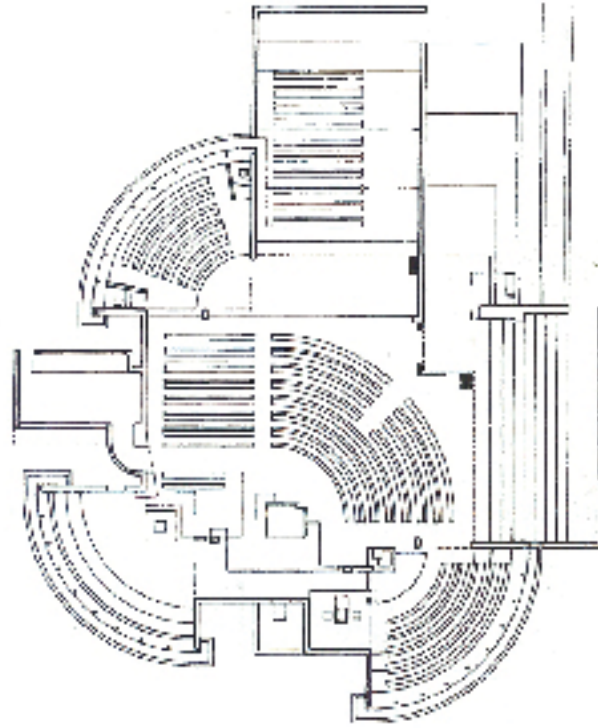


Fig 5.7 Mityana Pilgrims Shrine Plan

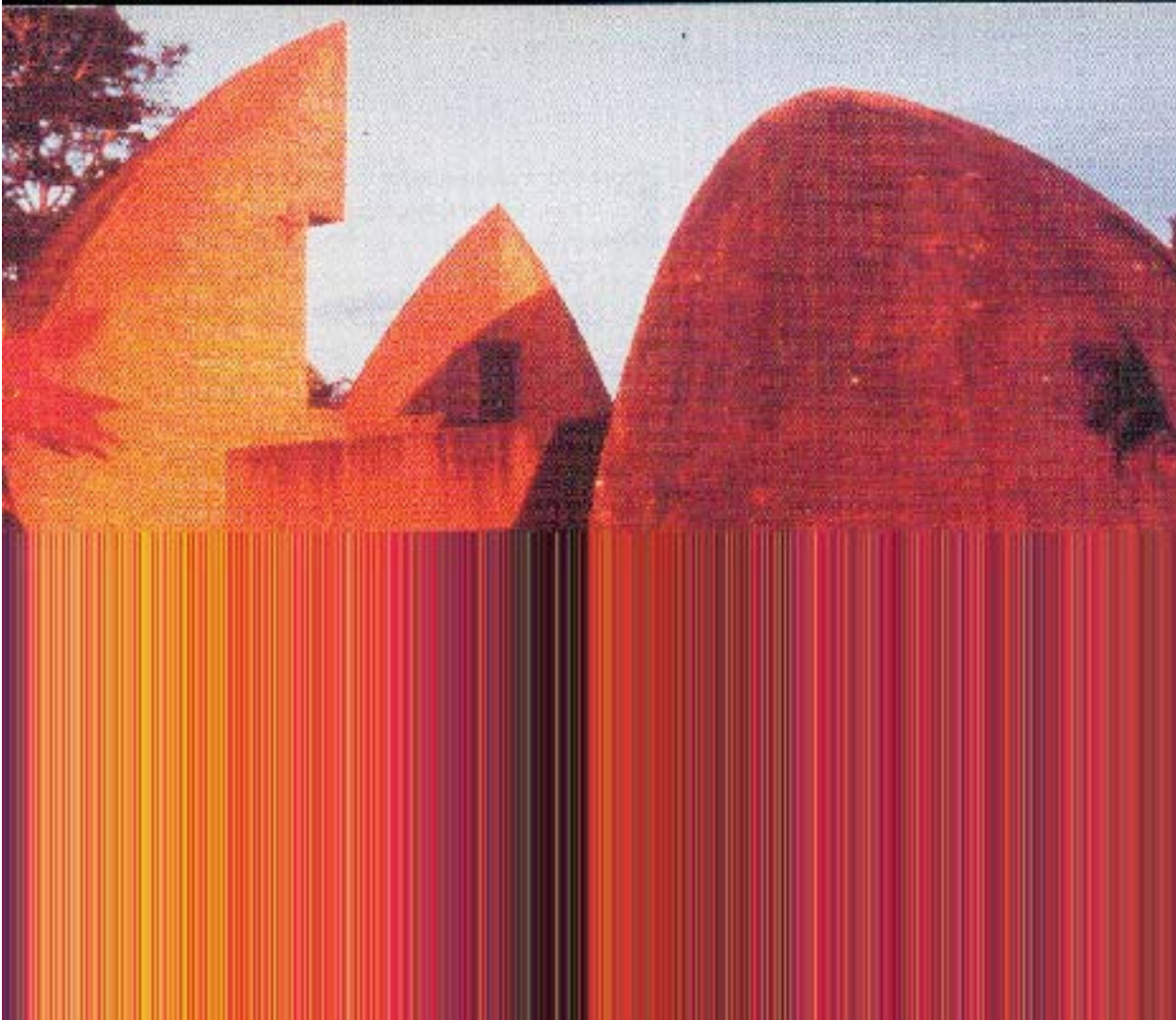


Fig 5.8 Mityana Pilgrims Shrine Plan

[Conclusion]

Can “architecture” survive in a place where people are struggling just to survive?

Recent architecture in sub-Saharan Africa has been a battle zone of its own. On one front are the proponents of the International style: bringing Africa into the 21st century by giving them tall glass buildings that have nothing to do with their culture, ability to sustain such buildings, and regardless of the impact of these buildings on an already fragile ecosystem. On the other front are traditional fanatics who simply want to replicate archaic buildings and would have everyone move back into grass huts with no electricity. Neither really encourages a balance of stewardship of the rich environment with improvement in the standards of living appropriate for this part of the world. There is a balance between the two, and that is where architecture will find success.

It begins with knowledge of the region that is being designed. Not just cursory knowledge of latitude and longitude, but intimate knowledge of people, what they value, what is available to them, and what can be improved upon; knowledge of the land, and the resources, and how a building can minimize its affect on the environment surrounding it.

Architecture in this part of the world not only involves educating the people whom

are to use the building, but also the rest of the region and the world. The world needs to know that there are cultures worth saving, worth studying in sub-Saharan Africa. That it is a rich tapestry of culture with a diverse, interesting, and *successful* past architecturally. New architecture built in these places shouldn't be seen as building for 'impoverished' communities, who simply need shelter. New architecture in these areas should inspire the communities to improve themselves. Shelter is a priority, but with little impact to environment or economics, buildings can be beautiful, inspiring, sheltering, and educational for everyone who uses them. It is this standard that we should strive for when creating architecture anywhere: sub-Saharan Africa is no different. The people there deserve to live life in beautiful buildings, easily recognizable as their own; buildings that do not use resources that they cannot spare, buildings that do not push an international culture and lifestyle onto people struggling to raise food for their families.

In an answer to the question: “*should aesthetic be considered when creating even the most basic shelter in a developing country*” the answer is a resounding “yes!”. Just because it is basic shelter does not mean that form, function, site, and culture have no place in the design. Will the result be a different aesthetic than the glassy sea of skyscrapers in Berlin? Yes. Will the result be a different aesthetic than the coral-made huts on a pacific island? Yes. But beauty can exist in a culture struggling to survive: it is where

the rest of the world chooses to find the beauty. It can be as simple as a domed roof above well constructed stone walls. It can be as simple as a roof that collects the rain water, and allows natural light into the dwelling. Beauty is found anywhere a building lives *with* its environment, not against it. Architecture should simply mean 'sensitive' design... it should encourage the emulation of itself for the improvement of many. "Susan Maxman, former President of the AIA wrote that 'sustainable architecture isn't a prescription. It's an approach, an attitude. It shouldn't really even have a label. It should just be 'architecture'.'"⁸⁸ This kind of architecture can not only *exist* in 'third world' countries, it is the necessary ingredient which will lift these people out of slavery to westernization. It is not in the conquering of nature that sub-Saharan Africa will find its power, but in creating architecture that enhances and compliments its rich environment and diverse cultural background.



[Bibliography]

Bibliography

(Endnotes)

- 1 "westernization." WordNet® 3.0. Princeton University. May. 2007. <Dictionary.com <http://dictionary.reference.com/browse/westernization>>.
- 2 Bonnett, Alastair, *The Idea of the West*, Palgrave Books, 2004
- 3 ibid
- 4 ibid
- 5 ibid
- 6 Phillip, Conrad. *Window on Humanity*. New York: McGraw-Hill, 2005
- 7 "Colonization." Columbia Electronic Encyclopedia. Columbia University Press. 02 May. 2007. <Reference.com <http://www.reference.com/browse/columbia/coloniza>>.
- 8 ibid
- 9 globalization." Encyclopædia Britannica. 2007. Encyclopædia Britannica Online. 23 Apr. 2007 <<http://www.britannica.com/eb/article-9344667>>.
- 10 ibid
- 11 ibid
- 12 Dr. Hans Martin Hirt. *Natural Medicine in the Tropics*. Anamed: Winnenden Germany, 2001, p.18
- 13 ibid, p. 18
- 14 ibid, p. 7
- 15 ibid, p. 13
- 16 ibid, p. 14
- 17 ibid
- 18 ibid, p. 7
- 19 ibid
- 20 ibid, p. 1
- 21 Guest, Emma, *Children of AIDS: Africa's orphan crisis*, Pluto Press, Sterling, VA, 2001, p. 18
- 22 ibid, p. 12
- 23 Campbell, Catherine. *Letting Them Die: Why HIV Prevention Programmes Fail*. Indiana University Press: Indiana, 2003, p. 4
- 24 Guest, Emma, *Children of AIDS: Africa's orphan crisis*, Pluto Press, Sterling, VA, 2001, p. 10
- 25 Campbell, Catherine. *Letting Them Die: Why HIV Prevention Programmes Fail*. Indiana University Press: Indiana, 2003, p. 5
- 26 Guest, Emma, *Children of AIDS: Africa's orphan crisis*, Pluto Press, Sterling, VA, 2001, p. 11
- 27 Campbell, Catherine. *Letting Them Die: Why HIV Prevention Programmes Fail*. Indiana University Press: Indiana, 2003, p. 6
- 28 Dr. Hans Martin Hirt. *Natural Medicine in the Tropics*. Anamed: Winnenden Germany, 2001, p. 11
- 29 "Africa" World Atlas. 2005. <[http:// www.worldatlas.com/africa](http://www.worldatlas.com/africa)>.
- 30 Elleh, Nnamdi. *African Architecture: Evolution and Transformation*. New York: McGraw-Hill, 1997, p. 1
- 31 ibid p. 2
- 32 ibid p. 6
- 33 ibid
- 34 ibid p. 23
- 35 Donahue (1979, 4) as cited in Elleh, Nnamdi. *African Architecture: Evolution and Transformation*. New York: McGraw-Hill, 1997, p. 43
- 36 Elleh, Nnamdi. *African Architecture: Evolution and Transformation*. New York: McGraw-Hill, 1997, p. 149
- 37 ibid p. 161
- 38 ibid p. 162
- 39 ibid p. 148
- 40 Elleh, Nnamdi. *African Architecture: Evolution and Transformation*. New York: McGraw-Hill, 1997, p. 168

- 41 Greenspun, Phillip. "Sukuma Culutre" 2001 Harvard University . <<http://philip.greenspun.com/sukuma/intro.html>>
- 42 "western Africa, history of." Encyclopedia Britannica. 2007. Encyclopedia Britannica Online. 23 Apr. 2007
- 43 ibid
- 44 information from personal interview conducted by author: Malaki Bujiku, son of a traditional Sukuma Healer, Jan 2007
- 45 Youngquist Walter, "Spending Our Great Inheritance - Then What?" Geotimes, 1998-JUL.
- 46 ibid
- 47 Leopold, Aldo. Sand County Almanac. New York: Oxford University Press, 1949, p. 48
- 48 Williamson, Radford, Bennets. Understanding Sustainable Architecture. New York: Spon Press, p. 21
- 49 Kiss, Gregory. "Building Integrated Photovoltaics" Sustainable Architecture White Papers. Brown David editor. New York: Earth Pledge Foundation, 2000, p. 32
- 50 *The Ethical Architect* page 162, as cited in Williamson, Radford, Bennets. Understanding Sustainable Architecture. New York: Spon Press, p.32
- 51 Williamson, Radford, Bennets. Understanding Sustainable Architecture. New York: Spon Press, p. 21
- 52 Williamson, Radford, Bennets. Understanding Sustainable Architecture. New York: Spon Press, p. 5
- 53 Kiss, Gregory. "Building Integrated Photovoltaics" Sustainable Architecture White Papers. Brown David editor. New York: Earth Pledge Foundation, 2000, p. 33
- 54 Williamson, Radford, Bennets. Understanding Sustainable Architecture. New York: Spon Press, p. 21
- 55 Hart, Sara. "The potential of bagasse reinforced soil-cement as roofing material" Architectural Record; Feb2006, Vol. 194 Issue 2, p129-136, 6p, 7c
- 56 Red Cross <www.redcross.com>
- 57 McLennan, Jason "Living Buildings" Sustainable Architecture White Papers. Brown David editor. New York:Earth Pledge Foundation, 2000, p. 27
- 58 Campbell, Catherine. Letting Them Die: Why HIV Prevention Programmes Fail. Indiana University Press: Indiana, 2003, p.26
- 59 Norberg-Shultz, Christian. Architecture, Meaning and Place, New York. p. 12
- 60 Dr. Hans Martin Hirt. Natural Medicine in the Tropics. Anamed: Winnenden Germany, 2001, p. 12
- 61 Lefaivre, Lane Alexander Tzonis. Critical regionalism Munich: Prestel 2004, p. 10
- 62 Lefaivre, Lane, Alexander Tzonis, "Why critical regionalism today". Theorizing a New Agenda for Architecture. Nesbitt, Kate ed. New York: Princeton Press, p. 489
- 63 Frampton, Kenneth. "Prospects for a critical regionalism". Theorizing a New Agenda for Architecture. Nesbitt, Kate ed. New York: Princeton Press, p. 469
- 64 Lane Lefaivre, Alexander Tzonis. Critical regionalism Munich: Prestel 2004,p. 10
- 65 Lefaivre, Lane, Alexander Tzonis, "Why critical regionalism today". Theorizing a New Agenda for Architecture. Nesbitt, Kate ed. New York: Princeton Press, p. 489
- 66 Frampton, Kenneth. "Prospects for a critical regionalism". Theorizing a New Agenda for Architecture. Nesbitt, Kate ed. New York: Princeton Press, p. 470
- 67 Williamson, Radford, Bennets. Understanding Sustainable Architecture. New York: Spon Press, p. 11
- 68 Lefaivre, Lane, Alexander Tzonis, "Why critical regionalism today". Theorizing a New Agenda for Architecture. Nesbitt, Kate ed. New York: Princeton Press, p. 489
- 69 Williamson, Radford, Bennets. Understanding Sustainable Architecture. New York: Spon Press, p. 12
- 70 Steffen, Alex. Worldchanging: A User's Guide to the 21st century. New York: Harry Abrahms Inc, 2005 page 292
- 71 ibid
- 72 ibid
- 73 ibid
- 74 Lefaivre, Lane Alexander Tzonis. Critical regionalism Munich: Prestel 2004, p. 66
- 75 Lefaivre, Lane Alexander Tzonis. Critical regionalism Munich: Prestel 2004, p. 67
- 76 Lefaivre, Lane Alexander Tzonis. Critical regionalism Munich: Prestel 2004, p. 67
- 77 Lefaivre, Lane Alexander Tzonis. Critical regionalism Munich: Prestel 2004, p. 66
- 78 Lefaivre, Lane Alexander Tzonis. Critical regionalism Munich: Prestel 2004, p. 82

Bibliography

- 79 Lefaivre, Lane Alexander Tzonis. Critical regionalism Munich: Prestel 2004, p. 83
80 Lefaivre, Lane Alexander Tzonis. Critical regionalism Munich: Prestel 2004, p. 83
81 Lefaivre, Lane Alexander Tzonis. Critical regionalism Munich: Prestel 2004, p. 82
82 Oppenheimer, Andre, Hursley, Dean and Thomas. Rural Studio. New York: Princeton Architectural Press, 2002, p. 49
83 ibid
84 ibid
85 Elleh, Nnamdi. African Architecture: Evolution and Transformation. New York: McGraw-Hill, 1997, p. 168
86 Elleh, Nnamdi. African Architecture: Evolution and Transformation. New York: McGraw-Hill, 1997, p. 169
87 Elleh, Nnamdi. African Architecture: Evolution and Transformation. New York: McGraw-Hill, 1997, p. 169
88 Williamson, Radford, Bennets. Understanding Sustainable Architecture. New York: Spon Press, p. 6



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(Image Sources)

- Fig 5.1 Lane Lefaivre, Alexander Tzonis. Critical regionalism Munich: Prestel 2004,p. 61
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Fig 5.3 Lane Lefaivre, Alexander Tzonis. Critical regionalism Munich: Prestel 2004,p. 49
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Fig 5.7 Elleh, Nnamdi. African Architecture: Evolution and Tranformation. New York: McGraw-Hill, 1997, p. 168
Fig 5.8 Elleh, Nnamdi. African Architecture: Evolution and Tranformation. New York: McGraw-Hill, 1997, p. 168