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FOREWORD
by David Hughes
Architect, Professor
College of Architecture & Environmental Design, Kent State University

I am truly honored to have been asked to write the Foreword for this special edition of ATL, featuring the extraordinary work of CPDI Africa and its founder Nmadili Okwumabua…

As I set out to pen the feelings I have for this endeavor, I found the very placement in this document as the key to my thoughts… forward. Whether forward thinking, fast forward or just advancing forward, the journal, the initiative, the research, the competition and certainly the body of design work takes African architecture forward.

Twenty two years ago, I authored Afrocentric Architecture: A Design Primer, to establish that Africa had a distinct architecture that would enhance modern expression in form, space and aesthetic, deriving from elements that have origins in Africa – cultural, historical or environmental. This effort was intended to plant a seed and bolster a dialogue that supported the efforts of a community of designers, students, scholars and academics who shared a concern that Africa was a very relevant participant in the world of contemporary architecture, design and construction.

I consider the work of CPDI Africa to be a stellar example and advanced manifestation of that seed coming to full blossom. Primarily, there are three distinct facets of CPDI Africa efforts that advance the consciousness and commitment to African architectural design: the format, the forum, and the focus.

The format used to put Afrocentric design on a level beyond the early concepts is the competition. This approach challenged the architectural community to acknowledge, regard, recognize and respect the premise that African design is exciting, substantive and sophisticated enough to warrant the attention, energy and sacrifice of accomplished designers, practitioners and professionals to produce intriguing designs as seen in the work that follows. Further, the effort to create exacting rules, criteria, and guidance for jury review was exhaustive. It called for a distinct approach, a specific building type, and a focused assessment of space, aesthetic and structure, which ensured a seriousness of quality in each submission.

The forum was even more ambitious: the international community of designers and thinkers. This forum allowed for a participatory reach far beyond borders or boundaries that define race, religion, cultures and geography. To garner interest across so many domains of creativity further established the merit of the concept and the work. However, the scope was wide for a relatively new body of thought and a very new organizing entity. Nonetheless, the results speak for the success of this aspect of the effort.

The focus was yet another level of brilliance, as it placed the work into an area that enhances a universal idea: quality living throughout humanity. This building type is certainly appreciated by all architects and designers, who will learn much from this concept about how to advance design in all realms. Thus, Afrocentric design can lead to a vibrant and essential aspect of creativity in the built environment.

Finally, I salute the jury that undertook the daunting task of review and selection from the many outstanding submissions. I am most impressed that the stellar assembly of critics could have been so patient in deliberation as to make their final decisions.

The work, the effort, the energy, the breadth, scope and the product that resulted in this competition, exhibition and publication take Afrocentric architecture forward, to a new height, appreciation and dynamic.

Let’s continue the march forward….
EDITOR’S INTRODUCTION

Introducing *ATL*, an Intersectional Journal for Alternative Knowledge Production
by Jesse Benjamin

It is a pleasure to introduce our new journal, *ATL*. We are committed to providing an interdisciplinary space for the intersectional exploration of a broad range of contemporary social issues. We chose *ATL* because the project is based in Atlanta, at a time when Atlanta stands at the nexus of important regional, national and international change, and burgeoning new movements for social justice. We are committed to providing a peer-reviewed space for intellectual work across an unusually broad range of researcher levels, from advanced students to advanced professional scholars, and including intellectuals working outside the academy, in the arts, the community and beyond. We are particularly attuned to underrepresented voices and perspectives, and seek to embrace innovation and experimentation.

Atlanta is emblematic of many of our core themes as a space of historic injustices, contestations, social movements and transformations. It is a capital of the US South, and has become a capital of the African American world, as well as within the Pan-African world, at a moment when global centers are shifting seismically. It is now also a major world city, with a completely global population. Our unusual Editorial Board structure is reflective of our location, and our boundary-crossing agenda. Aajay Murphy and I are the editors, and then we have concentric circles of Editorial Board members around us, emanating from our work in Atlanta, and at Kennesaw State University. This starts with a Student Editorial Collective, which includes our copyediting team, photographers, writers, scholars, and student leaders. This is followed by a Student Alumni Collective comprised of talented former students from our area who continue in their commitment to this work. This is followed by a large KSU-based Editorial Board across numerous departments; a community Advisory Board comprised of top regional scholars and community leaders; and a broader regional Editorial Board reaching across the geographic South, from Florida to Washington DC. This allows us to engage scholars from the advanced reaches of undergraduate study, to leaders in the international fields they represent, and to bring them into dialogue. While based in greater Atlanta, and grounded in engagement with this particular community, we are also connected to scholars throughout the regional South. We even include scholars originally from, or currently working on the South, so that we have the broadest possible interpretation of our mandate. We thus reflect and cultivate work by, for, of, and/or about the US South, and the infinite range of social issues occurring in the South. *ATL* is where we are, but as this issue reflects, we are of the world, engaging it from here.

In the broadest and most ambitious sense, a project such as ours is about epistemology and the construction and politics of knowledge. How and where is knowledge produced, how is it verified and recognized, and what epistemic and historical political-economic parameters circumscribe its representation? Questions of power, social responsibility, decolonization and social justice therefore guide us and are reflected in our boundary-crossing structures. We consciously seek to link Western and Non-Western perspectives, undergraduate and graduate students, theory and practice, the local and the global, students and advanced scholars, scholars and members of the community, activists and intellectuals, artists and writers and community leaders.

This first issue of *ATL* reflects these intended values well. From the first meeting with Nmadili Okwumabua, and upon hearing about her ambitious project promoting alternative and culturally relevant architecture in Africa, we knew this was the kind of project we wanted to support and work with. Coalescence was thus easy and immediate, and continues to grow. Architecture has its own Eurocentric tendencies, as do
most of our current disciplines and practices, and the assertion of culturally appropriate African architecture remains an intervention in the world of things as they currently are. Nmadili is not waiting for the world to catch up, and for discourse to shift; she is creating what needs to be, bringing her vision into being. In this case, it’s not just a theoretical vision either, as the winner of the design contest reflected in this volume will actually have their design built, on the Continent. That this project was considered off the radar of some at first, and rejected by others as too new, or too untested, was not a determent for either Nmadili or her CPDI team, nor for us at ATL. This is precisely the kind of engaged research we intend to foster in our new space. This is a space for new ideas, in which new terrain will be broken, and new or underrepresented ideas promoted.

We hope you will enjoy this exciting collection of design proposals, part of the *Community Planning and Design Initiative (CPDI) Africa – Design Competition*. We felt that the best global contributions received in this process were worthy of publication and propagation to a wider audience, because they were constitutive of vital alternative knowledge production of great potential significance. While our journal will normally function via a traditional double blind peer review process, we will make occasional stated exceptions when circumstances dictate. In this case, the detailed review process of the contest itself, and in which we participated, was considered sufficient for our purposes. Special thanks need to given to our dedicated Student Editorial Collective members, constituting a sub-team of dedicated copy-editors without whom this work would have been impossible: Shelby Cole, Stormy Kage, and Alisen Redmond. Similarly, Aajay Murphy made this project possible, both with his graphic design talents, and his ability to sometimes push the bounds of time and space. None of this would have come together without the unique qualities of Nmadili Okwumabua, who cultivates teams powerfully, and is a dynamic and driving force behind this vision. Beyond this journal launch, she is also orchestrating a traveling exhibition that will course through the US, and then on to Africa. Together with the building of the winning project, featured here, and the resumption of the next round of this project in 2017, this is clearly just the beginning. We look forward to the ongoing partnership.
INTRODUCTION TO THE SPECIAL ISSUE

Madams Suites, Livingroom Graves, and the Building of Africa in Her Own Image
by Nmadili Okwumabua

Have you ever imagined what the architecture of Africa would look like today, if the great civilizations of Egypt, Timbuktu, Mali, the Dogon, Zulu, Yoruba, and thousands of other African cultures had continued to develop and evolve in their own unique identity? Imagine the transformation of the African landscape into sprawling metropolises filled with architectural masterpieces celebrating new interpretations of traditional design elements, portrayed with all the comfort of modern innovations and technology. Amazing structures celebrating African aesthetics, in abstract and organic form, from technologically advanced materials that paid homage to architectural elements steeply rooted in Africa’s plethora of cultures. Now imagine once again that you have been given the opportunity to create that new architectural language for Africa...drawing inspiration from her glorious past, reflecting elements of her present identity, and then deliver architecture so dynamic and innovative it would define her emerging future! You, the creator and custodian of Africa’s newly built environment, advancing design language in the new millennium – the architectural language of a new Africa. Given the opportunity to develop Africa’s built environment in her own identity, what Africa would you build? This account begins with my first recollection of receiving this call to action, and how my response evolved over several adventurous decades, as I sought to understand where Africa had been, why she stood where she did, and exactly where she just might be going once she took her giant step forward.

*****************************************************************************

As a little girl, growing up in Nigeria, I had always been intrigued by spaces in which we live and call home. I often visited my friends, and marveled at the uniqueness of each of their homes, the arrangement of spaces, simple dwellings, grand palaces, artsy aesthetics and gaudy interior furnishings. It was when I started high school, in my American home town of Memphis Tennessee that I learned the profession I had a natural love for, was called architecture. Naturally, it was my chosen course of study when I entered the university.

As a design major, I learned all about Egyptian and Greek architecture, classical design, colonial, modern, and I wondered what Africa south of the Sahara had contributed to the discourse of world architecture. I yearned to reflect some of the design elements I could remember growing up in Nigeria, into my studio projects, but upon doing my research at the local library and book shops, all I found on African architecture were endless books on romantic, thatched roofed, ‘mud huts’, in rural towns and villages.

I realized a pilgrimage to Nigeria was crucial if I were going to first identify, then deconstruct whatever evidence I could find on contemporary African design, in order to incorporate those unique elements into my school projects and one day professional practice. I spent the first five weeks living in my ancestral family home, where I remember witnessing my Grandfather being buried in the living room, and later learning Great Grandad was buried in the dining room. I pondered on the ever so important connection between the spirit realm and the physical world, and how for my culture, the place we called ‘home’ was in every way truly the place where generations of my family would call home. The photographs that now fill my private collection are the results of my journeys across the Nigerian countryside, in search of a distinctly discernible architectural
language. The images represent homes I found in the land of the Edo, Yoruba and Ika-Ibo people of Nigeria. To start, I singled out buildings that visually celebrated unique characteristics, textures, contours, abstract forms, symbolic motifs, obvious spiritual influence… that could only be found, I guessed, in Africa. These buildings would lay the foundation for my research.

But first, let us, like I did, articulate a definition for what one would term ‘African architecture’, as it was important that I understand what constituted traditional African design, so I could successfully identify its contemporary translation when I came across it. Leading African architects and scholars Nnamdi Elleh, David Hughes and Demas Nwoko, define true African architecture (paraphrased) as the collaborative efforts between the artist and the architect, in their sincere desire to create comfortable, affordable dwellings that reflect the history, culture, aesthetics of the African continent, and utilize its appropriate local building materials. Traditionally, I knew African master builders had achieved the theories posed by the scholars, but how well had contemporary architects succeeded in achieving the stated definition. My findings proved that architects responsible for the buildings I had documented, had successfully articulated a visual identity that was indeed African, but had they achieved all the elements of design required to make it ‘truly African’ or truly comfortable for its inhabitants? How did the people’s culture, and lifestyle influence the homes? Let’s take for instance polygamy, as the basic family structure. A traditional husband with multiple wives would obviously require special bedroom space planning, in order for him to have easy, non-confrontational access to his wives’ chambers! The ‘Masters’ bedroom in this case would belong to the husband, while Madams bedrooms would be designed for his wives. Naturally it will be important to design exclusive quarters separating the numerous female children from male children. In contemporary times, polygamous families often choose to keep things simple by building completely separate homes for each wife and her children, in different parts of town!

What about aesthetics, and how were they typically reflected in residential design? Traditionally, patterns and motifs were often applied on building facades. These aesthetics would be loaded with spiritual symbolism, or sometimes purely decorative in nature. In more recent times, a technique called bronzing is used, which requires an artist to sculpt patterns on the final coat of wall plastering. Once the plaster is dry, the area is painted black and gold to achieve a bronzed effect. The building itself takes on the form on an abstract or sculptural monument, nestled in a manicured bed of tropical gardens and vegetation.

What about the impact of climate, environment, local building materials? Traditionally, homes and other ceremonious buildings would be built from laterite, local to the very site of the building. Being the perfect thermal material that it is, the building would be kept cool from the intense heat of the day. Today, the practice of using cement blocks with corrugated iron roofing sheets is not the best in communities practically sitting atop the equator! Houses feel like ovens, achieving an extremely low score on the test for comfort. The tradition of building with cement blocks goes back to the bygone era of colonization, when design and materials were dictated by foreign interests. Today, builders and homeowners continue to agonize over the cost associated with the impact of this forgone legacy, the challenge of cooling their buildings, using expensive diesel fueled generators and other private power plants. These examples just go to show, the development of a modern laterite ‘mud’ brick with the perfect thermal characteristics for building throughout Africa is long overdue.

My research evolved with the passing years, and eventually, I joined the pioneers who had mentored and guided my journey. I had become committed to what I believed was a higher calling, to contribute in my small way, to the development of architectural languages that bore true identity, and direct evolutionary linkages, to Africa’s rich and diverse architectural legacy. In 1999, I created Southern Sahara, an Atlanta-based, international research consultancy service, whose mission was to research and document this exciting discourse on architecture south of the Sahara. In 2007, the company’s affiliate, Southern Sahara Nigeria Ltd,
was incorporated in Abuja Nigeria, to offer unparalleled residential design, facility management and property brokerage to clients there. The fruits of these efforts gave birth in 2013 to the Community Planning & Design Initiative, Africa (CPDI Africa), a research-based, culture-inspired initiative created to develop this new architectural language for Africa, using design competitions as its platform. Believing that the redevelopment of Africa’s built environment should be as it has always been, built as a collaborative effort between the community members and designated master builders, CDPI Africa is built to engage participation from the design community in Africa and the Diaspora at large, for the accomplishment of its vision.

Year 2015 was phenomenal, witnessing the inaugural CPDI-Africa modern African architecture competition, as we received 58 stellar submissions from 29 countries around the world! A spectacular 25 winning designs where selected by a renowned, interdisciplinary Jury of built environment professionals, with the top three designs coming from Vietnam, Puerto Rico and The Republic of Benin. Honorable mentions were awarded to masterpieces submitted from the Nigeria, the Ukraine, Ethiopia, Uganda, Japan to name a few. Special recognition goes to our winning designers, Ms. My Dao Le Hong, Mr. Eduardo Soto, and Mr. Seni Dara, who were inspired by the architecture of Mali, Nigeria and Benin respectively. They have made a special place in history for themselves as the inaugural winners of the CPDI Africa design challenge!

It was during my appointment as a lecturer of African and African Diaspora Studies, at Kennesaw State University (KSU), that I met Dr. Jesse Benjamin, renowned scholar and activist at KSU, and founder of the Global South Research Consortium (GSRC). We immediately began to collaborate on this special edition of ATL featuring the CPDI Africa 2015 design competition. Our collaboration on the project was perfect, coinciding with the CPDI Africa - Art of African Architecture Travelling Exhibition, a celebration of the 25 Winning Designers. With Aajay Murphy managing production and graphic design for the project, a dynamic exhibition and journal publication was developed.

Our current plans are to travel the Exhibition throughout the United States, with our Sponsors & Partners such as the American Institute of Architects Georgia Association, before traveling the Exhibition to Nigeria and then Ethiopia. The exhibition will provide the opportunity to showcase these special international designers and their African architecture masterpieces, generating interest in their skills and talents for consultancies and further design development of these new architectural ideologies in brick and mortar. The CPDI Africa vision is to ultimately develop affordable communities in Africa that are culturally and environmentally sustainable.

In 2017, the 2nd CPDI Africa Modern African Architecture Design Competition will launch, to a wider audience, with specific focus on Africa’s six geographical regions. The prized opportunity for participants and partners of the CPDI Africa project will be Design-Build projects of the winning prototypes! Our Cash Prize and Winners Packages will remain stellar.

In my most sincere efforts to recognize the amazing support and contribution for this ground breaking initiative, I cannot give enough thanks to Nadine Levy, Akin Afolayan, Emmanuel Odai and Nony Mbazue, without whose their companionship and support on this long and winding journey, CPDI Africa could not have been born. To Dele Fadahunsi, Chidi and Roli Ukwu I give thanks for your contributions and belief in the dream and making it a reality. Chuks Okoye, Boye Akinola, Dennis Harold, Karla Dennis, DeShaun Jenkins, Jesse Benjamin, Kayode Babalola, Kwagga Eliphelet, Joe Osae-Addo I thank you wholeheartedly for your listening ears, your words of encouragement, your support! To Nuru Akinyemi, Lynn Robinson, Adeloyi Akanmu, Obi and Glory Okezie, Omar Pela, Samson Atureta, Manny Anyebunam, Kathryn Bedette, I thank you for opening doors and ushering in this pioneering effort. Thank you to Chike Oguamanam, without whom this project would not have become an international house hold name! And to Asabe Mamza, Kopji Golit, Kid Chukwudo, Amina Manko Ibrahim, Xin Wang, Terso Akuto for being the best research and design...
team ever. Special recognition goes to my mentors, I am ever indebted to them, Demas Nwoko, Nnamdi Elleh, David Hughes, Jack Travis, Carolyn Armenta-Davis, and my amazing design professor, Robert French. Of course, my love and deepest appreciation to the entire Okwumabua Family, for being the solid foundation upon which I stand, and to the Creator, who blessed me with my loving family and, this special calling.

In closure, this innovative research holds the answers to many of the exciting challenges Africa’s emerging built environment professionals will tackle in the fast approaching future. CPDI Africa provides more than just a platform for African inspired creativity. We support the development of African architecture course curricula, R & D for African centered building and zoning codes, the elimination of huge affordable housing deficits, and the provision of design services and building contracts for talented built environment professionals! Thank you for your participation, and we welcome your inquisitive spirit as you enjoy this special edition of ATL, exploring the Art of African Architecture!

************************************************

NMADILI OKWUMABUA is an urban planner and African architecture historian. Her passion for design is rooted in a vision where homes and communities in modern Africa are developed with a new architectural language that celebrates the aesthetics and culture of her people today. In 1999, she founded Southern Sahara USA, a design consultancy service specializing in the research and development of this new architecture, which she promotes through exhibitions and lectures.

Nmadili Okwumabua attended the University of Tennessee and Georgia State University, where she pursued her undergraduate studies in architecture and urban planning. She is a licensed Realtor in the state of Georgia and Certified Property Manager with Broll CBRE South Africa. She holds a master’s degree in African Studies from Clark Atlanta University, where her research centered on the evolution of modern vernacular architecture, by Nigeria’s premiere designer and master builder, Demas Nwoko. The fruits of these efforts gave birth in 2013 to the Community Planning & Design Initiative, Africa, (CPDI Africa), a research-based, culture-inspired initiative created to develop this new architectural language for Africa though design competition.

Believing that the redevelopment of Africa’s built environment should be as it has always been, built as a collaborative effort between the community members and designated master builders, CDPI Africa engages participation from the design community in Africa and the Diaspora at large, for the accomplishment of its vision. Ms. Okwumabua lives in Atlanta Georgia and Abuja Nigeria, where she offers international consultancy services in urban design and real estate asset management, and shares her vision with the futures shapers of Africa built environment.

Providing Africa with Modern Residential Architecture That is Both Culturally and Environmentally Sustainable

INTRODUCTION TO THE SPECIAL ISSUE
COMPETITION PROJECT BRIEF
by CPDI Africa 2015

The Community Planning & Design Initiative Africa (CPDI Africa) is a culture-inspired, research-based, design-build competition, created to inspire the development of successful neighbourhoods and communities on the continent, with modern African architecture that is both culturally and environmentally sustainable. Believing that the redevelopment of Africa’s built environment should be as it has always been, built as a collaborative effort between the community members and designated master builders, CPDI Africa engages participation from the design community in Africa and the Diaspora at large, for the accomplishment of its vision.

CPDI Africa works through annual design competitions, where students and practitioners in the global design community develop residential prototypes, guided by a ‘kit of parts’ database of African architectural elements. A panel of distinguished Jurors, consisting of our well renowned architects, Africanists, artists, urban planners and engineers, will select winning designs for the CPDI Annual design-build events in Africa, and for the publication of our annual design compendium. Designers who create winning prototypes that best fit interpretations of modern African architecture, will receive cash prizes, design recognition and also participate in the design-build trips to the various featured African countries.

The CPDI design-build competition is open to both students and practicing designers across the world; applicants may register from all parts of Africa, the Americas, Caribbean, Europe and Asia. Participants may enter the competition as individuals, or may submit their entries as part of a team of designers, artists, engineers, and planners. The competition is open to any race, religion or creed, and encourages collaborative ventures between development professionals in Africa and the Diaspora. Campaign events to create awareness of the design competition commenced in 2015, with a series of exhibitions and information seminars across the US and Nigeria.

CPDI Africa is a signature initiative of Southern Sahara Nigeria Ltd and Southern Sahara Realties USA. In a collective effort to accomplish shared goals for innovated solutions for sustainable development in Africa, Southern Sahara has initiated relationships with both private and public Partner Organizations such as The Nigerian Institute of Town Planners, The American Institute of Architects, The National Organization of Minority Architects, Global South Research Consortium, Acres & Acres Abuja, Mass Media Productions, the Centre for African and African Diaspora Studies at Kennesaw State University. CPDI Africa continues to establish relationships with organizations who promote shared interests in this ground breaking initiative, and are committed to achieving mutual goals through the objectives set by CPDI Africa!
The Challenge:
To Design An Innovative Residential Home That Reflects The Comforts Of Contemporary Urban Lifestyle, Yet Celebrates The Essence Of Traditional African Living

1. Create a Design Concept for a One or Two Bedroom Bungalow
2. That Is Humble Yet Dignified in Concept
3. Not More Than 120 Square Meters (1,300sqft)
4. A Floor Plan That Reflects an Element Of African Culture, Lifestyle, or Philosophy
5. That Celebrates the Visual Aesthetics of An African Identity
7. That Explores The Concept Of The Modern ‘African Kitchen’
8. Pays Homage To The African Concept Of Courtyard Design
9. Can be Constructed with Less Than $30,000.00 USD (The equivalent once converted to any African currency)
10. Can Be Replicated Easily By Both Skilled and Un-Skilled Laborers

Prize Awards – CPDI Africa 2015 Competition

Winning Prize
• $5,000 cash prize
• Best Design Recognition, and prototype chosen for the Design-Build Project
• Major feature in our publication on contemporary residential design for building in Africa.

Runner Ups
• Second Prize of $2,000, major feature in publications, plus Special Awards
• Third Prize of $1,000, major feature in publications, plus Special Awards

Special Awards
22 notable applicants will receive these Special Awards:
• Special feature in publications on contemporary residential design for building in Africa.
• Recognition and presentation of their submissions at the CPDI Africa Award Ceremony.
• Opportunity to earn paid internships with Southern Sahara and affiliate Organizations.
• Opportunity to advertise their designs and architectural services on the International CPDI Africa platform.
• Invitation to participate in CPDI Africa design-build projects, in Africa & the Diaspora.
• Invitation to feature their works in the annual ‘Art of Modern African Architecture’ Traveling Exhibitions.
• Special appearances in the CPDI Africa educational and documentary films on architecture, community planning and urban development for Africa.
• Opportunity to attend local and international seminars and workshops hosted by Southern Sahara and CPDI Africa!
THE INNA
by My Dao Le Hong
Architect | Vietnam

1ST PLACE WINNER
Inspired by the people and culture of Mali
African vernacular architecture is impressively rich with ingenious techniques that early dwellers used to protect themselves from the diverse weather conditions. Great examples of well-thought vernacular architecture are found in hot and arid climate zone regions where earthen architecture prove to be the great response. In Mali, a country known for its use of earthen architecture, bungalow homes called the Inna are found and are an endless source of inspiration for the development in African homes today. In this project, traditional techniques are rediscovered and applied to a modern prototype of the Inna.

The Inna is a typical bungalow which tries to bring low cost, sustainability and very high living quality for the next generation of African housing. It also allows flexibility in order to accommodate the different needs of the house owner. Learning from vernacular strategies, along with integrating modern technology, the goal of the Inna is not to limit its use for only responding to the Mali climate, but to become an adaptable prototype in many different regions of Africa.

FUNCTION ORGANIZATION

African lifestyle is diverse all over the continent, through many countries, regions and ethnic groups; however, common characteristics can still be found within its architecture. Figure 1, 2 and 3 show aerial views of traditional homesteads in different regions. The homesteads are all combined of many smaller houses, and each house is used for one function and is located in its appropriate functional zone. This clear separation allows for each house to have its own size, shape and construction type. Then, in one homestead, the visual appearance and construction type of the main house, insaka, ganaries, or pigeon coops are different.

As part of Africa’s social, economical and cultural changing, the modern lifestyle requires the house to be more compact, private and efficient, causing some functions to be removed or changed. For example, the modern kitchen and dining room are important gathering areas and instead of being kept in the backyard of the homestead, they have been positioned in the front. The modern lifestyle also requires a more separated bedroom to keep privacy for family members. However, the vernacular African lifestyle is still maintained in modern living by allowing for enough space to accommodate large family gatherings and events. The kitchen has always had an attached kitchen yard or scullery for food preparation and trash. Hence, to find the right answer for modern African house layout, the functional zones need to be transformed and reallocated according with modern requirements, while still promoting social interaction inside the house. That is where the Inna starts to form.

MASSING AND COURTYARD

Due to the warm African climate, people use outdoor spaces for many reasons. These spaces can be designed for focus or functional use. In vernacular dwellings, plenty of seating and different outdoor space is important; the design always tries to incorporate as much nature as possible.

The outdoor space is still kept even when the population growth and the land use requirement is much higher. An example of an Yoruba traditional house type in Nigeria would show that the room layout is more compact and aligned, but a generous courtyard is still provided for various activities. One great example of a courtyard is Roman Domus. Even though this example does not originate from Africa, this courtyard is worth to learn. They use the yard and pitched roof as the rain water collection, known as the impluvium.

Learned from the past, the Inna form by simple principle: the interlocking of courtyard and functional areas. This organization allow flexibility in changing and adapting with different needs of owners but still keep the main concept and space quality. These courtyards, discussed in depth later on, play a major role in the climatic control of the house.
INSPIRATION

Earthen architecture is at best celebrating African architecture. Earthen architecture differs from country to country, with different types and forms such as rammed earth, mud brick and mud wall. It was often linked to poor housing and self-building phenomena and wasn’t considered worth being studied in depth. However, over centuries, earth material proved to be durable and sustainable as it well respond to the context. Mali possess one of the most amazing earth structures: Djenne Mosque.

Another inspiring earthen architecture is New Gourna Village, Egypt by Hassan Fathy. All details of vault openings are neat and sophisticated. The light is filtered through careful openings, creating sacred light environment. This masterpiece is a great source to learn from.

The most attractive feature of earthen architecture is the opening. When the outside environment is harsh, the opening should be very careful in position and size to achieve visual and thermal comfort. All of the design details are to respond to the context, as shown by the amazing aesthetic taste of Fathy. Earthen architecture is the endless inspiration both aesthetically and technically for modern architecture.

CLIMATIC CONDITION

Mali, the country of inspiration, has a climate so diverse, it represents climatic conditions across the entire African continent. The country’s climate ranges from tropical in the south to arid in the north. Most of the country receives negligible rainfall; droughts are frequent. Late June to early December is the rainy season. Mali faces numerous environmental challenges including desertification, deforestation, soil erosion, and inadequate supplies of potable water.

The arid regions are dominated by tents and houses with flat roofs or terraces with relatively thick walls. These areas measure against the great drought of wind, solar radiation, solar reflection, sandstorms, dust, insects and parasites. In the tropical region, the traditional sloping roofs are more frequent. The houses in this region require natural ways to combat heat (with a relative humidity of at least 50%), solar radiation, precipitation, insects and parasites. The Inna attempts to respond to the Mali climate and from that be able to adapt with different climatic patterns of Africa.

*Thermal mass:* Thermal mass strategy in Africa is mostly found as thick earth wall, which can stabilize indoor temperature, slowly absorb heat from harsh sunlight and release the heat during night time.

*Stack ventilation:* Stack ventilation is passive ventilation that uses air pressure differences due to height to pull air through the building. Hence, high opening is easily found in hot and arid climate.

*Cross ventilation:* Cross ventilation occurs where there are pressure differences between one side of a building and the other.

*Evaporative cooling:* Cooling through evaporation is an effective way to low down the temperature. Figure 18 shows the air captured is cooled by a small fountain before entering living space.

*Hot and cool courtyard:* Simple but effective strategies are positioning the courtyard with two characteristics. One is the cool courtyard: shaded, with greenery or a pool. The other is the hot courtyard: unshaded, no greenery or pool. Temperature difference between the courtyards will generate air flow from the cool courtyard to the hot courtyard. Then, the space between the two courtyards will have good ventilation.
Wind tower: Wind towers catch the passing winds and channel them down to the ground and living spaces. They provide effective ventilation to refresh the air and remove unwanted smells from cooking. When there is no breeze, these towers still serve as a means to good ventilation.

PERSPECTIVE
After evolving from vernacular architecture as well as learning passive strategies from the past, the Inna was developed with simple and efficient massing by rammed earth. All openings were positioned carefully and the facade is inherit from Earthen architecture, in Mali, with an extruding wooden bar.

THE PLAN
The Inna has a roofed / livable space area that totals 120m². The preferred orientation is for the bedroom and living room to be northward. However, the Inna still can respond well with different orientations if the master plan requires change. The entrance hallway leads to the open plan lounge and dinning room. The dinning room is the central gathering area.

Next to the dinning room is the open patio. This patio is used on a cool day or in the evening. In some family gatherings and feasts, the dining room can fully open toward the patio and become a big gathering area. On hot days, the patio acts as the “hot courtyard” to generate air flow from the “cool courtyard” (impluvium). The dining room in between the courtyards will benefit from cool ventilation. Also, cooking smells can be swept away. The kitchen leads to a kitchen yard, where people can prepare food and clean.

In the middle of the house is the impluvium courtyard. This courtyard capture rainwater and recycle water for domestic use. The courtyard also provides moisture for evaporative cooling. The central position of the courtyard benefits living spaces of the house.

The living room has a full internal door facade and, on cool day, the door can fully open to connect with the impluvium. The master bedroom has one private toilet and shower. From this bedroom, people can see full view of the impluvium. The small bedroom also can benefit from the impluvium and an extra small bedroom is provided, either use for guest or staff.

SECTIONS
A double layered metal roof is used to prevent direct heat. The use of a metal roof will be explained in more detail in following sections.

THE INNA RESPONDS TO DIFFERENT CLIMATE
Responding to arid climate
In this climatic condition, the house is mostly closed to protect from harsh outdoor environment. The rammed earth wall acts as a thermal mass to protect the house from extreme heat. The stack ventilation is only used for ventilation. In this case, all the exterior low windows should be closed; the upper high and small openings are carefully open. The indoor space takes fresh and cool air from inside the courtyard and releases the hot air though high openings.

The open patio and the outside garden act as a “hot courtyard” and the impluvium acts as a “cool courtyard”. This will automatically create the frequent air flow from indoor to outdoor without any help from wind. If the impluvium pool has water, evaporative cooling will happen and will be even more effective to cool down the space. Spaces are able to close for local zoning in relation to time of operation to better control the thermal factors.
Responding to tropical climate

In this condition, the humidity of the air is even higher so combating with the heat is still the main job of the house. The rammed earth wall act as thermal mass to protect the house from the heat. Here, cross ventilation can be used to cool down the area. The hot courtyard and cool courtyard principle still works in this circumstance. The space needs to be able to open, allowing cross ventilation from space to space. The tall dinning roof acts as a wind catcher during windy days.

ROOF

The chosen material is white metal roofs. Although producing metal is energy-intensive, it is long-lasting, cheap, lightweight and easily recyclable. Metal roofs can last up to 50 years which means less waste in the long run. Metal offers exceptional durability and fire-resistance, and they’re ideal for those who want to collect rainwater from their roofs to water gardens (or for household uses). With the metal, there will also be no worries about chemicals that might leach from a conventional asphalt roof.

A roof painted white can actually reduce energy use by about 20 percent in hot, sunny weather, according to the Lawrence Berkeley National Laboratory Heat Island Group in Berkeley, Calif. The white roof reflects the solar radiation and absorbs less heat than a roof in another color. The roof is doubled with a layer of air in the middle, presenting heat transmission very well. Even when the metal roof becomes very hot on a sunny day, the heat transfer to the indoor environment is still limited. The pitched roof to inside prevents solar reflection from the roof to the neighbor house.

TECHNICAL APPLICATION

Horizontal flow reed bed treatment can be used to filter rainwater in the impluvium. Reed is available in Africa and is a great natural water filtration. It is environmentally friendly, using only a natural, sustainable ecological processes. Gravity driven systems don’t require any energy input. Maintenance requirements are low, but as with most systems, cannot be ignored. Operational and maintenance costs are low and can be carried out by anyone with a modicum of gardening skills and common sense.

The filtered water then leads to a storage for domestic use. Depending on the efficiency of the system, the water can be cleaned enough to cook or just used for shower, sink, gardening and toilet flush.

CONCLUSION

As a conclusion, vernacular architecture gives endless lessons about passive climatic controls. Even though the bungalow is set in an extreme climatic zone, some techniques could be successfully implemented for high quality living environment. Additional studies of vernacular dwellings could surrender ideas of aesthetically pleasing structures that are very efficient in terms of energy use.

Compared with the low construction cost required, the Inna can provide dwellers with a very high living standard. The using cost is also minimized, as the house requires limited need of air condition and artificial lighting. The Inna is easy to build in a short amount of time because of its simple shape and form. It also allows flexibility to change in function and room size according to the different needs of the inhabitants. The Inna uses pattern and motif from Mali architecture in the design. However, it is believed that using vernacular strategies is the best way to celebrate African architecture.
CPDI AFRICA 2015
The Inna sections (scale 1/100)

SECTION A-A
BEDROOM  IMPLUVIUM COURTYARD  DINNING ROOM  OPEN PATIO

SECTION B-B
LIVING ROOM  IMPLUVIUM COURTYARD  MASTER BEDROOM
The Inna plan (scale 1/100)

CPDI AFRICA 2015

Grid: 1m²
Roofed / Livable space total area: 120m²
IFA HOUSE
by Eduardo Soto
Architect | Puerto Rico

2ND PLACE WINNER
Inspired by the culture of the Yoruba people
INSPIRATION

The Ifa House aims to capture the essence of the traditional Yoruba compound palace. Its inspiration comes from the synthesis of the two traditional dwelling types most associated with the Yoruba people: The Orowa House and the Courtyard House.

The traditional Yoruba dwelling types, the Orowa House and the Courtyard House, originate around the idea of a communal space enclosed by small rooms.

The concept of the Ifa House incorporates elements of both the Orowa House as well as the Courtyard House. The Ifa House features an interior courtyard that opens to the sky for ventilation, natural light, and rainwater collection. The rooms that surround the courtyard feature screen walls that allow ventilation and views to the exterior gardens. The openness of the plan along with a high roof structure allow cross ventilation and natural lighting to permeate the entire structure.

TRADITIONAL ARCHITECTURAL ELEMENTS

The most prominent architectural element incorporated into the design is the roof structure used to collect rainwater and solar energy. Its inspiration comes from the traditional impluvium featured in many Yoruba houses. This roof helps to create a sustainable structure and naturally helps hot air escape the structure.

The house features other Yoruba architectural elements like the carved veranda post, carved wood doors, fluted walls, and corrugated metal roofing. To complement the design, the house also includes multiple gardens and a cistern to collect water.

TRADITIONAL AESTHETIC

The Yoruba culture is well known for their use of carved wood pieces for a variety of architectural elements. The use of Yoruba wood carving in the Ifa House is notable in the following areas:

• Highly decorated exterior doors
• Exterior carved panels
• The carved wood caryatides
• Fluted walls
• Lime plaster
• Bamboo ceilings
• Corrugated metal roofing

The conceptual idea behind the inverted roof is best illustrated by a traditional Yoruba divination cup known as Agere Ifa. This cup is often made out of carved wood and it represents human figures holding a bowl. In the same fashion, the Ifa house has an inverted roof that is used to collect rain water and solar energy while being held by carved human figures.

BUILDING MATERIALS

The materials chosen for this prototype have been carefully chosen based not only on their aesthetic value but on their proven performance and availability.

• Exterior and interior walls: Compressed Stabilized Earth Blocks
• Roof and ceiling: bamboo
• Screen walls, operable louvers: Palm Wood Timber
• Columns, beams and foundations: Concrete with additives
• Floor: Ceramic tiles
• Kitchen: Bamboo cabinets, terrazzo counter tops
HEATING, COOLING, VENTILATION AND AIRFLOW

The Ifa House is designed specifically to maximize cross ventilation into all the interior spaces. An air gap inside of the hollow roof structure acts as insulation. Operable louvers control the amount and direction of the air current that enters the house. Finally, interior screen walls allow different degrees of permeability to find the proper balance between privacy and ventilation.

THE AFRICAN KITCHEN

Traditionally, the African kitchen was a space located separate from the main structure based on practical considerations such as fire hazards and smoke. Using modern and efficient kitchen accessories makes it possible to feature the kitchen in a centralized location of the Ifa house. This makes the kitchen area an integral part of the social aspect of the modern African architectural space.

WHY A PROSPECTIVE HOMEOWNER WOULD CHOOSE THIS DESIGN

A homeowner would prefer to buy a home that features traditional techniques and concepts and provides a cultural connection. In addition, this house makes great use of space and energy and offers some independence from public infrastructure.

FEATURES THAT COULD BE BUILDING CODE

- Proper reinforcement for brickwork and structural connections for bamboo.
- Compressed Stabilized Earth Blocks are made from a combination of local clay and a small percentage of Portland cement. These blocks are compressed into various molds with manual or powered machines, offering endless possibilities in terms of design. The proper reinforcement is key to maintain structural integrity and the safety of the users.
- Structural bamboo’s strength relies not only on the unique characteristics of this plant, but also on the proper structural connections incorporated into the design.
TATA FU
by Seni Dara
Architect | Benin

3RD PLACE WINNER
Inspired by the cultures of Togo and Benin
The countries of Togo and Benin are both characterized almost exclusively by their circular architecture. Locally sourced materials are often used in construction including earth, stone, wood, and straw. However, buildings have begun to modernize by using different materials such as cement, porcelain coated stoneware tiles, and iron or tile roofs.

The main feature of the circular architectural design is the amount of detail used in the creation of interior spaces. The boxes, most of which are round are arranged in a circle, thereby forming an inner courtyard. This courtyard functions as a space for family gatherings or for household activities like cooking, which is done both inside and outside in the central courtyard. In this proposal, these particular aspects of Tata architecture are taken into account.

Based on the given architectural program, we concluded a two bedroom house (1 bed each) with a living area and a kitchen. Inspired by local architecture, each of the rooms is circular and located near a courtyard. The kitchen has both an interior and exterior space, with proper ventilation for smoke provided in the indoor space.

In our proposal, we opted to provide sustainable solutions to local climate challenges. Thus, each window is protected by an awning that has a particular design inspired by the stones found in the area. The roofs are all sloped and covered with terracotta tiles while walls are made of compressed earth bricks. This will ensure an excellent thermal comfort to the building, while accordingly optimizing the total cost of construction. In addition, local materials like stone and wood were also highlighted in this project.

This project design includes terraces and patio gardens as external spaces of communion. It is a modern take on a traditional architectural design certainly replicable on a larger scale with larger homes.
1. The walls are made of compressed earth blocks.

2. The windows are wooden louvered.

3. The roofs are all sloped and covered with terracotta tiles.

4. Steel column

5. With the presence of a large courtyard, the air currents circulate freely in all the compartments of the house.
THE OMO
by Roman Gorshkov
Architect | Russia

HONORABLE MENTION
Inspired by the Omo River in Ethiopia
INTRODUCTION

This report describes a design proposal of a 2 bedroom bungalow house in Ethiopia. This project report was developed based on the original competition brief and provides well detailed information about structure, interior design, and sustainability regarding cultural and architectural research.

Prior to developing this design proposal, a study of local cultures and beliefs was undertaken, and different parts of Africa were carefully examined to choose a target group and location for the project. The Design prototype of a “future” African house was developed as an efficient and simple way to construct space that is very modern-looking but at the same time appreciates African traditions and ways of living, providing comfort and elegance.

BRIEF SUMMARY

The design brief encourages the development of an affordable “future” home for African people so they could feel a connection with their past within the space they live. This project was informed by three elements of design: culture-lifestyle, aesthetics, and sustainability.

CULTURE

“Omo Residence” is the name chosen for this project. It gets its origin from the Omo Valley and pays respect to the people of this region and their culture. This proposal is based on the idea of protective areas and courtyards, inspired by traditional African architecture. Every circular part of this design provides separate zones that organically divide the house into private spaces. By introducing big open-to-skies in circular fashion, soft lighting and a unique atmosphere are created. Inspiration for this idea comes from clay open homes that are put together to form organic courtyards and open zones providing for different usage, such as a kitchen, patio, living room, and bedroom.
DESIGN PROCESS

Traditional architecture in Africa provides colorful and varied examples, ranging from mosques in Djenne and Great Zimbabwe to simple yet unique clay homes and shelters in Mali and Ethiopia. Landscape, people, and the nature of spaces play a big part in forming this concept. This diversity provides a great inspirational base for different design ideas. Through the design process, involving sketching, creation of physical models, and thorough cultural research, 3 options were developed.

After careful consideration of all elements of these ideas the climate response, cultural connection, and ease of construction of Option One was chosen, as it provides the most efficient design for the home of the future. It is the option that will help to facilitate a deeper connection between the residents and their culture.
OPTION ONE

This option is organized as a series of protective spaces formed by circular shapes. These shapes provide a connection to the traditional round African hut. Inspiration for this idea came from the clay open African homes that are put together to form organic courtyards and open zones that provide the various usage possibilities.
OPTION TWO

Flowing like a snake, this design celebrates the great Omo River. Organic, green and simply designed, this project was formed for a unique identity that also provides an easily recognizable shape. This building is part of the landscape and nature of the Omo Valley.
OPTION THREE

Pitched and impluvium roofs are one of the design elements of African architecture. Inspired by cone shaped patios for collecting water, this option gives a beautiful interpretation of the impluvium room through a modern lens, by creating a very strong, sharp and organic form.
LAYOUT

The plan consists of the main spaces you would expect in a modern home, such as an entrance hall, kitchen, dining area, bedroom, master bedroom, guest room, and patio with an open kitchen. By organizing the kitchen, dining area, and open kitchen on one axis, it provides a good connection between the spaces and gives a nice view outside to the open kitchen and courtyard.

The building itself consists of three independent structures with separate entrances providing public and private separation for guests and owners. By locating bedrooms on the east side and guest room with living spaces on the west, open space in-between these two areas provides a natural separation and creates a courtyard with an open kitchen.
AESTHETICS

The facade tries to be straight and organic at the same time to fit well in a natural landscape. Most parts of elevations are made from rammed earth wall structures with natural ripple pattern that recalls wave ripples on the surface of the Omo River. On widows, mashrabiya screens are used to protect from heating issues. The pattern is based on original plan design of the building itself which recalls traditional patterns used in African rugs and cloth.

LANDSCAPE

Being an urban house makes it hard to provide an experience of the natural African landscapes, that is why non-urban elements were chosen for the site to make it feel as rural as possible. Natural ground cover, wild grasses and buses with big decorative stones all create an illusion of being outside on a free land without constraints of modern culture.

SUSTAINABILITY

Sustainability was the main concern for this project. All design decisions take into consideration the use of locally available materials and the climate of the region. This scheme provides good shading and cross ventilation to prevent overheating internal spaces. Place for water collection is also provided.
STRUCTURE
Considering the cost of the project, it was designed to be easily constructed by unskilled workers with sustainable materials. The diagram above shows the simplicity of the construction process and the elements of the building. This project also provides unique flexibility in its structure and reusable parts. It consists of identical elements that can be building blocks for other design ideas and options for this project.

INTERIOR DESIGN
The main goal for designing internal spaces was to create a warm and comfortable environment where people could feel protected, but at the same time provide a connection to the outside open spaces. The open courtyard that opens up from the kitchen provides an enclosed open space that serves as a place for family gathering and celebrations.
FUSION POINT
by Zuhra Zuhair
Architect | Nigeria

HONORABLE MENTION
DESIGN NARRATIVE

Architecture in Africa today is a receding echo of our history traced back from ancient Egypt to the layers of cultural diversity influenced by indigenous architecture, colonialism, western architecture and religion. As a result, Africa’s historical and cultural heritage, which are a reflection of Africans, are lost in translation. Fusion Point, a home design prototype, aims to reflect Africa’s heritage and create spaces that Africans can relate to on an elementary level. It evokes memories of our history and influences that inform our lifestyle through architectural design.

CULTURE AND LIFESTYLE

Fusion Point features an internal courtyard, which serves as the social core of all other activities revolving around it. The significance of the courtyard can be traced back to the earliest record of African architecture in ancient Egypt. On the subject of the evolution of African architecture, Nnamdi Elleh reveals the description of ancient Egyptian habitations by the French explorer Felix Dubois, who indicates that they were characterized by enclosed courtyards with plastered walls. The subsequent use of the courtyard is evident in various regions of Africa such as the Ashanti culture in Ghana, Equatorial Guinea, Djibouti, the city of Lamu in Eastern Africa, as well as the Yoruba, Hausa and Igbo cultures of Nigeria.

The facade of Fusion Point displays a modern interpretation of entry portals. Records of African architecture in ancient Egypt depicts the use of large entry pylons. Dubois, in his description of the houses in Mali, states the similarities brought down from ancient Egypt. Subsequent cultures in countries such as Nigeria, Cote D’Ivoire and Burkina Faso have adopted the use of pylons and elaborate entrances as a large symbol of power. In the Yoruba culture of Nigeria, the Oba’s Palace known as the afin, have highly decorated and elaborate entrances. Nancy C. Neaher also relates the use of imposing carved door panels by the people of Awka in Igbo land in the decoration of their portals.

The entrance at Fusion Point features protruding plastered brick surfaces with sharp sloping sides characterized by the simplicity of form embodied by modern architecture. The facade is further decorated with symbols constructed with polystyrene and metal panels.

The anteroom serves as the entrance hall to the house. Additionally, it creates an extra level of security. A similar space in the Hausa culture of Nigeria is called the zaure. Muhammad-Oumar describes the zaure as an entrance hall mainly used by the male members of the family to receive guests.

A door leads to the living room from the anteroom. All rooms open into the courtyard and direct access is provided from the kitchen to the dining room. An emergency exit and service door is situated near the outdoor kitchen area. Each bedroom has its veranda or porch, which reflects Western influence on Africa, and their use in the Yoruba culture of Nigeria. The door and gate to the veranda of the second bedroom can be accessed from the exterior for guests residing temporarily within the building.

The exterior form of the building mimics a pyramid shape with sharp sloping sides. The pyramid has its symbolism in Africa as a depiction of eternal presence and power.

AESTHETICS

The entrances and facade of the building is decorated with metal panels depicting geometric patterns found in Islamic religion, Igbo culture and Ashanti culture in Ghana. In Igbo culture, the mgbo ezi, which are panels that span the entrance to a compound, are intricately designed with geometric shapes. Symbols derived from the adinkra, a hand woven fabric developed by the Ashanti culture, are often found decorating the walls of their houses. Symbols decorate the entrances of Fusion Point and the metal panels, which also serve as burglary proof within the building.
Fusion Point utilizes local sustainable materials that reflect Africa’s history, evolution and climate. It creates a dialogue between the past and the present through tactile representation of African architecture.

The building is constructed with oven heated bricks left bare and plastered only at the protrusions of the building. Bricks are locally attainable in many parts of Africa. It has superior thermal properties, can withstand corrosion, and resist fire.

A gable roof flanked by parapet covers the building. The wooden roof members are visible from within the interior. Polystyrene ceiling is fitted between the spacing of the wooden rafters to provide a smooth and modern finish to the ceiling. Timber is also locally available in many parts of Africa such as Nigeria, Ethiopia and the Democratic Republic of Congo. In the eastern part of Nigeria, it was used extensively in traditional housing.

Bamboo is used to partition the living and dining rooms. It is utilized to form the structure of the bedroom verandas. Additionally, it is used in the zaure to create a security barrier and simultaneously admit light into the building. The use of bamboo provides a light weight structure that separates spaces but allows natural ventilation and daylight without the use of solid walls with windows or openings. Its lightweight structure provides flexibility of design as opposed to block or concrete walls. Bamboo is locally available in Africa, particularly within the tropical regions.

Aluminum framed glass doors and windows provide access into the courtyard and admit daylight into the rooms. Blinds made from raffia provide protection from glare. Raffia is used extensively in traditional Igbo Yoruba architecture for walls and roof construction. Its application adds indigenous character to the building in addition to its functional purposes.

Traditional architecture in some parts of Africa have a history and relationship with the landscape. Where fruit bearing trees are available, they are planted within the compounds and used in home cooking. The perimeter of the courtyard at Fusion Point is lined with fruit bearing trees that can be harvested for cooking.

The arrangement of spaces around the courtyard offers a more sustainable arrangement in terms of ventilation and daylight. Additionally, circulation is easier and more flexible as opposed to the rigid plan of modern housing.

SUMMARY

Fusion Point creates a dialogue between Africa’s history from ancient Egypt, and its transition to modern architecture. The utilization of spaces such as the use of the anteroom, courtyard and verandas reflect African living from historical and cultural Western influences. Locally available materials reflect the character of indigenous architecture. The application of symbolic patterns and elaboration of entrances evokes memories of Africa’s history and culture. The pyramidal form of the building reflects ancient African symbolism and ideology. The use of modern materials such as glass, aluminum and polystyrene reflect our transition to modern architecture. The composition of all these gestures creates a thoughtful architecture that provides a harmony and reflects the influences that form the heritage of African architecture.
CETIANA

by Nahom Bekele
Architect  |  Ethiopia

HONORABLE MENTION
Inspired by the people and nations of Ethiopia
INTRODUCTION

The Cetiana prototype is a home majorly inspired from the Nationalities from the Southern Nations, Nationalities, and Peoples’ Region in Ethiopia (SNNPR). The SNNPR is a conglomerate of different traditional people. Based on the 2007 Census conducted by the Central Statistical Agency of Ethiopia (CSA), the SNNPR has an estimated total population of 14,929,548. 89.98 percent of the population are estimated to be rural inhabitants, while 10.02 percent are urban; this makes the SNNPR Ethiopia’s most rural region. With an estimated area of 105,887.18 square kilometers, this region has an estimated density of 141 people per square kilometer. For the entire region, 3,110,995 households were counted, which results in an average of 4.8 persons to a household, with urban households having an average of 3.9 and rural households with 4.9 people.

The SNNPR, being an amalgam of the main homelands of numerous ethnicities, contains over 45 indigenous ethnic groups.

INSPIRATION FROM TRADITIONAL HOUSES

The Gurage people are a Semitic-speaking ethnic group in Ethiopia. According to the 2007 national Census, its population is 1,867,377 people, of whom 792,659 are urban dwellers. This is 2.53 percent of the total population of Ethiopia and 7.52 percent of the Southern Nations, Nationalities, and People’s Region (SNNPR). The Gurage people traditionally inhabit a fertile, semi-mountainous region in southwest Ethiopia, about 125 kilometers southwest of Addis Ababa, bordering the Awash River in the north, the Gibe River to the southwest, and Lake Zway in the east. In addition, according to the CSA, the Gurage can also be found in large numbers in Addis Ababa, Oromia Region, Dire Dawa, Harari Region, Somali Region, Amhara Region, Gambella Region, Benishangul-Gumuz Region, and Tigray Region.

Wolayita: In the mountainous region east of the river Omo, hundreds of stone Monoliths bear witness to the long time habitation of this area by early men and the people who live there today are very likely from fairly early stock. These people are light-complexioned and short, and they belong to the vast Ometo language group.

As far as religion, the people belong to either the Muslim or the Christian traditions and celebrate in temples shaped from the rock, akin to those found in Lasta and Tigray.

EVOLUTION OF FOOT PRINT

All three traditional houses have a similar circular footprint. The reason for this is the ease of construction and nature of the structure used. Although the construction is easy, the single monotonous circular footprint limits the programs within and require multiple blocks to accommodate various programs.

In an urban context, the parceling of land is made in a rectangular manner, in order to make the best use of the land changing the footprint of the traditional houses. A rectangular manner will be suitable in case of urban centers.

Further re-adjusting the rectangular footprint enables the creation of pocket courtyard spaces and a clear definition of spaces as well as more surface area for lighting and ventilation.

SPACE PLANNING

Space Usage Concept

Most traditional spaces, or traditional houses in Ethiopia, in the SNNPR have an open floor plan system and programs are segregated using furniture arrangements claiming their own space. The advantage of having an open floor plan enables multiple programs to take place within a single space at different times. This space usage system enables flexibility of programs and enhances versatility.
Courtyard Spaces

Courtyard spaces are vital to the SNNPR people of Ethiopia because it is where most daily activities and family gatherings take place. In this prototype the living spaces and the kitchen extend to the open courtyard allowing traditional cooking and different activities to take place.

‘MODERN AFRICAN KITCHEN’

Ethiopia has more than 80 ethnic groups meaning it has different kinds of food. One of the most famous is injera, a thin, porous bread, and is a product of enset for the SNNPRs. Just as there are the basic space requirements in a standard international kitchen, the same theory applies for an African kitchen i.e. storing, washing, cooking/preparing and heating. In the case of the African kitchen, additional exterior use is needed especially for the preparation of raw materials. Examples would be spices that are sun-dried and the manual grinding and pounding when using a mortar and pestle when making coffee, just to mention a few.

The integration of modern kitchen in this prototype includes introduction of electrically generated utilities: refrigerated stress, blenders, etc. Injera and kocho are common in the SNNPR and it is a necessity to have a circular oven locally known as a mitad.

With this particular prototype, the kitchen is arranged in a flexible manner. It has sufficient space for open air and high ceilings for ventilation and releasing heat with a vertical exhaust system common in most traditional kitchens. This kitchen layout would be best if it were to be a building code for African kitchens.

STRUCTURAL SYSTEM

The design of this prototype enables builders to use multiple materials, making it versatile and giving the structural system a variety of options. The recommended structural system of this prototype is a FRAME system which makes the construction easy to manage. Listed below are possibilities of each component. Items are written in hierarchy from the best option to the least efficient.

- Walls: straw-board, wooden panels, adobe super block, or CIS with insulation
- Floor: concrete and timber, timber alone, or concrete alone
- Fenestrations: timber, bamboo, steel frames and screens with 6mm clear glass glazing
- Roofing: CIS ega sheet, shingles, clay tiles, bamboo roof
- Foundation: precast concrete pads, strip masonry footing

Bamboo in Ethiopia

The Ethiopian natural bamboo forest is about 1M ha, which is 7 percent of the world total and 67 percent of the African bamboo forest area.

Bamboo Species and Ecology

Two recorded natural species of bamboo grown in Ethiopia are:
- Arundinaria alpine k.shum known as “highland bamboo”
- Oxytenanthera abyssinica known as “lowland bamboo”

SUSTAINABILITY

- Bamboo can grow as fast as three feet in a day
- Can be sustainably harvested every year
• Uses a small fraction of the land required by trees for the same structural work
• The waste (leaves and branches) can be as nutritious of an animal feed as alfalfa
• Bamboo can convert society’s waste nitrogen, mulch and water into a construction material that fixes 17 times as much carbon per acre as trees

PROPERTIES
• Compressive strength of bamboo is stronger than wood, brick and concrete
• Tensile strength of bamboo is as strong as steel
• Because of bamboo’s ductility and light weight, houses built with the material have survived earthquakes of 6.7 magnitude
GROUND FLOOR

- Toilet: 1.2 m²
- Maid's Room: 4.2 m²
- Store: 3.8 m²
- Indoor Kitchen: 8.9 m²
- Dining Space: 12 m²
- Foyer: 12 m²
- Living Space: 17 m²
- K. Patio: 8.8 m²
MEZZANINE FLOOR

BEDROOM 2
8.5 m²

C.BATH
4 m²

+ 3.00

READING/SITTING SPACE
9 m²

BEDROOM 1
12 m²
THE IRELE
by Adeyemi Akande
Architect  |  Nigeria

HONORABLE MENTION
Inspired by the art and architecture of the Yoruba and Hamer peoples
INTRODUCTION
Irele is inspired mainly by the traditional architecture of the Hamer people of Ethiopia and, contextually, by the ideals of Yoruba daily living. In addition to the two architectural cultures mentioned above, a thematic aesthetic element used in the prototype is the West African “humility and strength” symbol.

The design has avoided the direct translation and copy of ancient form. Rather, it rigorously sought to present a form based on the interpretation and understanding of traditional space function and order, and has appropriated it in a modern dialect.

THE SKIN
The fundamental feature that makes up the visual character of the prototype is the repetitive cylindrical exterior wall made to mimic the texture of closely packed sticks as seen in the traditional architecture of the Hamer tribe.

A MODERN TWIST
The design adequately considers the traditional lifestyle of the two tribes mentioned, but more importantly it interprets these lifestyles and appropriates them in the context of modern demands. Therefore, a space such as the reading lounge becomes essential as it responds to an aspect of our current lives.

WELCOME KINSMAN, I SHALL JOIN YOU OUTSIDE
The design pays keen attention to the treatment of exterior space as “the outside” is socially more important than “the inside” in African architecture. Hence, the elaborate entrance porch which serves as a major family space in the evenings after the day’s work. In practically all African tribes, the idea of interior space is strictly for sleeping and other private activities and not entertainment of visitors. The concept of a living room is foreign to traditional Africa, though it has been well integrated. Irele attempts to reclaim the original system of entertaining guests by creating an outside appeal at the entrance for family and guests. The entrance porch thus captures an essential part of our social practice and it encourages a healthy interaction and conversation among talking parties void of the distraction of electronics like television.

THE SYMBOL OF HUMILITY AND STRENGTH
This image served as a binding icon throughout the design. The idea was to use it as an aesthetic element to tie the two featured cultures together while presenting the notion that through humility, we can come together as Africans. And our coming together will give us untold strength. The symbol is featured prominently on the iron burglary proof and also on the railings of the roof garden. It also boldly brings all elements together in the mini courtyard. This symbol is sometimes called Dwennimmen in areas of Ghana.

WHAT WAS USED?
The deliberate approach was to employ common, easy to find materials that are relatively maintainable. Materials chosen are intended to sublimely situate the prototype within the context of modern life without disposing the homeowner to undue scrutiny and awkwardness. The foundation was done with reinforced cast concrete. The walls are a mix of baked clay and cement blocks covered with plaster and paint. Roofing tiles cover the front side while the rare end is of concrete decking. Burglary proof is made of iron. Windows are glass, while stone, gravel and tiles are used both outside and inside respectively. Wood is used for columns. If the construction process and project flow is prudently executed, the prototype will border around the 6 million Naira mark – this I must say is an extremely tight budget and some of the feature seen in the 3D
rendering may be greatly simplified to cut cost, e.g. the carved columns.

HEAT AND VENTILATION

For cooling, the windows are large and carefully positioned to maximize cross ventilation. In addition, heat release vents are situated near the ceiling at different points of the house to mitigate effects of rising hot air and evacuation of the same. The vents also allow efficient air flow fed through the courtyard void.

AFRICAN KITCHEN

Clearly tiled floor and the pounding mortar cannot work. This prototype splits the kitchen into two: the inside and outside kitchens. The inside part caters for the everyday activities as prescribed by modernity while the outside part which is an integral of the whole house system is made of concrete slab floors and only has a 1 meter high wall. It is semi covered and it allows for all forms of traditional African cooking such as frying with palm oil, pounding yam in mortar, grinding/cracking nuts, sieving grains, mixing semi solid food in pots placed between the cook’s feet on the ground, etc. The inside kitchen epitomizes the modern side but in this design it has responded to the admixture with traditional times too by its integration with the outside kitchen.

WHY BUY THIS HOUSE?

This design responds to the changing and often contradictory demands of the mixture of traditional and modern lifestyles. It captures the metamorphosis of Africanism as we venture into a future without losing our identity. The following features help make this design a preferable option for African families.

- The roof top vegetable garden: sustainable and healthy. Also presents a further private area for family members.
- The ventilation is excellent making for a cool system in the African heat.
- Courtyard: the modern reality and challenge of the courtyard system begs the issue of security and convenience (rain, insects etc). This design responds to these challenges adequately.
- The central part is not paved so to facilitate efficient percolation.
- It has blinders that can manually be pulled down during down pours and to prevent uncontrolled intrusion of insects attracted to night lights.
- Allowance is made for an optional manually retractable security barn door that can secure the courtyard opening at night while still allowing airflow.
- Further shading for the outside porch area can be done manually by pulling an inbuilt mat down to shield the sun’s rays and this also prevent rain splashes.
- The interiors are simple and space interaction is well defined
- Spatial transformation: The living area has large retractable doors. When open, it gives a sense of space continuity with the courtyard and allows maximum airflow.
- Efficient water collection through a detailed sprout system that transports rain water to a collection tank behind the house. Water collected here is used for watering the vegetables.

BUILDING CODE

I recommend that a green roof should be a requirement and at least 30% of the land should be
ASSITA
by Jun Yanagimuro, Hayashi Yoichiro & Ignacio Darras (NAAD)
Architect | Japan --- Architect | Spain --- Designer | Japan

HONORABLE MENTION
Inspired by the people and culture of Burkina Faso
ARCHITECTURE AND VILLAGE PLANNING

We found an interest in the circular shape being a very strong image of their vernacular architecture and configurations. It gives us the opportunity to create simple modules that can be freely added in many different ways, depending on each different preference.

DISTRIBUTION

In this type of urban planning, each house looks like it’s considered as a small city, creating spaces that surround an open common area for the family and community. Everything is connected to the neighbors to socialize. No big walls are raised to separate one boundary from another. And if so, big openings are made to let the guests in at any time.

ANALYZING THE IMAGES

• Interaction between public and private space
• Moving freely around the boundaries
• Creating different inner spaces inside the whole terrain
• Using the top of some roof areas for storing grain, tools, and to be able to sleep there during warmer nights
• Adding partitions to make an outer space
• Each house connects to every other in a spontaneous way
• Most spaces relate to a common courtyard for social events

PROS AND CONS: FINDING SOLUTIONS AND KEEPING THE GOODS

Pros

Socializing: As we see, for the African community, the meeting areas and outer spaces are one of their strongest beliefs. Closing a house to the others will be considered unsocial.

Current knowledge and materials: Such as with timber, steel and structural knowledge, and clay or earth bricks.

Cons

Weather conditions: Highly exposed to sun, architecture should take this element as its main focus, using different strategies to cool down each space of the house.

Solutions

Detached Roof: The use of a detached roof to conduct the inner hot air out was a must in our design. Offsetting the roof edges would give rain protection to our clay walls, so maintenance is required less regularly.

Circulation vs. Living: Living and moving around the same spaces will increase the inside temperature because of body heat. We propose a “double skin” so we can make a difference between stay and move/distribute. It will also protect the walls from sun exposure.
AREA: 105 sqm
AFAR SIDAMA
by Amanuale Brook
Architect | Ethiopia

HONORABLE MENTION
Inspired by the Afar and Sidama people of Ethiopia
The prototype presented in this paper is centered on a combination of Sidama and Afar vernacular architecture. This type of architecture mainly focuses on the similarities and symmetrical nature of domed form. The Afar-Sidama prototype prominently, yet simply combines rustic elements, either integral to the architecture or as part of the decor, with modern style to create a functional and modern architecture.

AFAR

One of the most uninhabitable places in the world, Afar is located in the Rift Valley where the climate is very hot and arid. However, it displays the most unique vernacular architecture shaped by their nomadic traditions, mostly constituting of temporary shelters. The livelihood of the people is based on cattle rearing. The settlements are dependent on water and grazing land availability for their cattle. Once the people in these settlements have found a suitable spot, they camp in groups of two to six families. The tent, generally made of wooden frames and leather mats, is built by the women. The men build the enclosing fence around the tents and the fence for the cattle.

In order to build the tent, the women dig 15-20 cm deep holes to erect the structure/armature. The armature is composed of three types of arches. The first is the longitudinal side arches (arhina), which are erected. Next, it is followed by the transversal arches (abol), which form the roof of the tent. Depending on the size and rigidity of the particular tent, the third row of arches (allawe) are put up. After a coherent structure has been made, the longitudinal and transversal arches are connected by threading in a small cord (maderto) of bark.

Finally, the armature is covered with three layers of overlapping mats. These mats are tied to the structure with strings of bark. A small permanent entrance (affa) with 80 cm high and 35 cm wide is located at one end. At night, it is covered with a small mat (arafayta). Wind and light come in through the entrance, and during extremely hot days, some mats are partly rolled up to let in the breeze. The interior finishing is also completed by the women. The bed, which measures 2.25 m x 1.9 m, is a rectangular frame and grid supported by vertical members. It is also used for sitting during conversation and meals.

SIDAMA

The form and structure of Sidama typology is mainly the result of the material used. Onion shape and circular plan are created through flexibility of the bamboo plant. The Sidamas prefer to do most work in groups and the construction of their homes is not an exception. A group of men who form the ‘Chinancho’, a crew of skilled weavers, are called on for construction of homes of the other members at any time. The people in Chinancho select a leader called Murcha to supervise the whole construction process which takes two to eight weeks. Members who do not cooperate are excluded from the group.

The traditional house division is known as ‘iota’. It has 3 parts: the residential, the cooking space, and the ‘arkata’ for a cattle and crop store. The interior is accessed through a porch and it’s divided into ‘olico’, living area of the people, and ‘hadro’, space for cattle. The ‘olico’ is further divided into ‘holge’, parent’s sleeping area, and ‘bosalo’, sleeping area for children and guests. The ‘bosalo’ is also used for storing production materials and other small items.

The interior partition separating ‘holge’ and ‘bosalo’ is made of wicker work. Upright poles of as tall as 1.7 m are stuck into the trench fairly close to each other. The next stage is the wicker work. The vertical bamboo is woven onto lean horizontal bamboo strips the roof is made simultaneously. The inner layer of the roof bamboo rafters and intermediate sticks are tied together in concentric circles using bamboo rope. The partially completed roof is then put in place supported by the central post. More vertical posts are added and tied with strong twigs and no scaffolding is necessary.
VERNACULAR ARCHITECTURAL ELEMENTS INCORPORATED IN THIS PROTOTYPE

- Domed Form
- Middle and Surrounding Courtyards
- Kitchen Patio for External Use
- Modern Functional Space Arrangements
- Entrance
- Ethiopian Vernacular Inspired Form

PROGRAM

**GROUND FLOOR**

<table>
<thead>
<tr>
<th>Space</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courtyard</td>
<td>17 sq. m</td>
</tr>
<tr>
<td>Main Entrance</td>
<td>2 sq. m</td>
</tr>
<tr>
<td>Guest Room</td>
<td>12 sq. m</td>
</tr>
<tr>
<td>Corridor</td>
<td>12 sq. m</td>
</tr>
<tr>
<td>Living</td>
<td>11 sq. m</td>
</tr>
<tr>
<td>Dining</td>
<td>9 sq. m</td>
</tr>
<tr>
<td>Kitchen</td>
<td>12 sq. m</td>
</tr>
<tr>
<td>Outdoor Kitchen</td>
<td>8 sq. m</td>
</tr>
<tr>
<td>Bathroom</td>
<td>12 sq. m</td>
</tr>
<tr>
<td>Store</td>
<td>6 sq. m</td>
</tr>
</tbody>
</table>

**FIRST FLOOR**

<table>
<thead>
<tr>
<th>Space</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Master Bedrooms</td>
<td>22 sq. m</td>
</tr>
<tr>
<td>Bedrooms</td>
<td>20 sq. m</td>
</tr>
<tr>
<td>Bathroom</td>
<td>8 sq. m</td>
</tr>
<tr>
<td>Corridor</td>
<td>6 sq. m</td>
</tr>
<tr>
<td>Balcony</td>
<td>18 sq. m</td>
</tr>
</tbody>
</table>

BUILDING MATERIALS

- Roof – Concrete arched column-beam and ring beam with roofing tiles
- Floor – Concrete floor slab with brown finish
- Walls – Mud blocks
- Foundation – Stone masonry
- Ceiling – Balcony and entrance roof – roofing tiles, bamboo

EXTERNAL FINISHING

- Wall finishings are African color and textures in water tight fabric
- Burned tile clay for roof’s tile
- Masonry stone for foundation and sitting
- Bamboo for ceiling

VENTILATION AND AIR FLOW

Each and every space is connected with a central courtyard to facilitate cross ventilation, through stack effect into upward roof directions. The balcony’s roof overhangs to prevent excessive, direct sun light on the balcony and entrance. Placed in adequate positions, this prototype also includes a recessed window which will reduce the temperature and create airflow.

This prototype is designed with the modern functional play layout in the vernacular geometrical form. It includes African ornamentation and aesthetics with durable, locally available building materials and the necessary functions and utilities of security and privacy required in modern living. Lastly, flexibility is considered in this prototype using the ground and first floor for different owners as multi-dwelling units.
GROUND FLOOR
FIRST FLOOR

BATHROOM
8 msq

BEDROOM
20 msq

CORRIDOR
6 msq

MASTER BED ROOM
22 msq

GREEN AREA
3 msq

BALCONY
7 msq

OPEN DOWN

AFAR SIDAMA
HONORABLE MENTION

Inspired by the pyramids of Egypt
INSPIRATION

The design of IJE, which means “journey” in the Igbo language, is called such because of the transformation of the traditional architecture of Egyptian pyramid into a contemporary form.

The concept of the design is a true reflection of African culture and heritage. It showcases the highest iconic symbol that Africa has ever produced, the Egyptian pyramid, which is the most famous structure in Africa. The pyramids of Egypt remain one of the world’s greatest early architectural achievements. The design concept is achieved in an interesting way by having different heights that show hierarchy of space through proper massing and a central courtyard that connects the rooms.

TRADITIONAL ARCHITECTURAL ELEMENTS

- Pyramids formed with high pitched roof
- Courtyard
- Kitchen patio for external cooking
- Entrance porch used as an Obi

TRADITIONAL AESTHETIC

The facade system is a modular system, which is practical and cost efficient. The modular bottle panel facade system will give the building excellent performance and durability. The concept is inspired by Kente cloth which is deeply intertwined with the history of the Ashanti nation. The word “Kente” means basket in the Ashanti dialect. Kente cloth designs vary, with the different designs, colors, and patterns each having their own special meanings.

COLOR

- Blue --- peacefulness, harmony, good fortune, love
- Green --- vegetation, planting, harvesting, growth, good health
- Pink --- associated with the female essence of life, calmness, sweetness, tenderness
- Red --- political and spiritual associations, bloodshed, sacrificial rites and death
- White --- purification, sanctification rites, healing
- Yellow --- preciousness, royalty, wealth, fertility (yolk of an egg)

BUILDING MATERIALS AND ISSUE OF HEATING AND COOLING

Facade Cladding: The main facade cladding is recycled PET plastic bottles, encouraging a green, clean, and sustainable environment that is free of non-biodegradable materials. The facade is a way of promoting the African culture of preservation and commitment to exemplary clean environmental actions. The bottle facade acts as an intelligent passive design solution to prevent heat gain and reduce cooling load by providing optimum shading during the hot weather of Africa, regardless of the location of the buildings anywhere in Africa and the orientation of the building on site.

Walls: The building walls are compressed stabilized earth block (CSEB), which are construction blocks made from a mixture of soil and a stabilizing agent (7% cement) compressed by different types of manual or motor-driven press machines. The CSEB is 26.5 X 14 X 10 cm in dimension, the weight is 8 kg, smooth and flat in texture. 35 blocks will make up a square meter. On performance, CSEB has a wet compressive strength of 2mps, a thermal insulation of 1.0 W/mc and a density of 1900 kg/m3.
Floor: The floor is raised by 200-400 mm above the ground level, using bricks and concrete blocks/stones, to define plinth perimeter. It is filled with compacted earth, topped with half bricks and screened with 20 mm of cement mortar.

Fenestrations: The windows are glass casement windows while the doors are wooden panels for the inner doors of 750 mm for WC and 960 mm for rooms. Steel is used for the external doors.

STRUCTURAL ELEMENTS

- Foundation: Because the column is set in the footing, it is 150x300x300 mm in dimension, cast in situ concrete and relatively 500 mm deep below natural ground level depending on the site location.
- Exo-skeleton Structural Frame: 200 mm diameter round inclined bamboo column coated with dark brown low emission glossy paint is the main exo-skeleton structural frame for the facade cladding.
- Column: Prefabricated reinforced columns are aligned and erected over concrete footing. A single column point consists of 4 steel rods of 12 mm diameter each, interconnected with 5 mm steel rod cross bracings to reduce effective length of the column. Light weight concrete is poured on the reinforced concrete column to fill up the gaps and help increase the load barring capacity of the column.
- Beam: Single beam consists of 4 long steel rods, 12 mm in diameter with 5 mm steel rod cross bracings. Light weight concrete is poured on the reinforced concrete beam to fill up the gaps and help increase the load carrying capacity of the beam.
- Truss: Bamboo rafters or trusses supporting bamboo purlins.
- Roofing: Brown shingles for roof covering.

VENTILATION AND AIRFLOW

The rooms are cross ventilated to ensure efficient ventilation with window height at 1800 mm and 1500 mm width for the bedrooms while the living room has large fenestrations. The headroom is at 3200 mm for proper airflow while the facade system and the courtyard encourage passive ventilation (stack effect) and airflow. The high pitched roof ensures proper airflow.

FUNCTIONALITY OF THE AFRICAN KITCHEN

The proposed kitchen is on the private zone at the rear side of the building linking the dining area, store and courtyard. With a U-shaped arrangement, the space is well utilized. The kitchen patio is for outdoor cooking.

REASONS FOR A PROSPECTIVE HOMEOWNER TO BUY THE HOME DESIGN

The design has sustainable local materials: bamboo, 27,723 recycled bottles, and mud. It is also affordable, durable, and has excellent thermal properties and aesthetics compared to a ‘modern’ house.

FEATURES THAT COULD BE BUILDING CODE

The use of recycled PET bottles as a building element to encourage a green, clean environment.
K’JONG
by Nakimuli Thatcher, Lawrence Okoth & Brian Murungi
Architects | Uganda

HONORABLE MENTION
Inspired by the Karamojong people of northern Uganda
BACKGROUND
The design daubed the ‘K’Jong House’ has been informed by the intimate study of Karamojong culture and lifestyle. The Karamojong people are a group of Nilo-Hamite agro-pastoralist herdsmen that mainly live in the North Eastern part of Uganda and K’Jong is an urban moniker used to refer to the Karamojong people.

The Manyatta: This is the traditional unique village settlement of the Karamojong. It is comprised of families from the same clan, surrounded by one to three walls made of local thorn bushes mixed with mud to protect from raiders, its inhabitants and their cattle-- a prized possession and a divine birthright to them. In the center of the Manyatta is the courtyard or Kraal.

The Karamojong Shelter: The Karamojong shelter is characterized by various architectural features from form to material and construction technique.

TRADITIONAL ARCHITECTURAL ELEMENTS INCORPORATED IN THE K’JONG HOUSE
The Manyatta Design and Layout is inspired from the Manyatta beads and accessories which are used for the design of the roof form into a spiral feature to give the house an inverted conical form.

The Courtyard (The ‘New Kraal’): By proposing a new scale for the entry to the courtyard, it is made expandable to host events and also for children to play, reflecting a traditional essence and purpose. It is open to the sky and accessible from all rooms in the house.

SOURCE OF AESTHETICS AND ARTISTRY: AN AFRO-CONTEMPORARY AESTHETIC FUSION IN THE K’JONG
Building Form as Sculpture – The walls have been molded around the corners to enhance the organic finesse of the layout plan.

CHARACTER AND PERSONALITY
Patterns and Texture: This will include inimitable engraftment of patterns representative of the homeowner onto architectural features in the house such as lintels, ironmongery and burglar proofing, door and window frames in order to make the house unique and personal.

Color: The K’Jong uses bold primary colors against brown and while neutral walls as color accents on openings.

MATERIALS, CONSTRUCTION AND SUSTAINABILITY
The K’Jong borrows from African traditional approaches by using:
• Walls – Custom clay, mud or laterite bricks that can be built on site promoting cost efficiency and sustainability through low construction costs. Finishes are in adobe plaster in shades of brown.
• Roof – The K’Jong will use timber trusses and brown clay tiles with woven patterns of bamboo trusses to create a bold and strong pagolla for the kitchen patio and the courtyard areas
• Floors – Polished cement screed.
• Borrowing from West African traditional impluvium, the courtyard will be used to allow for rain water harvesting within the home, hence offering an alternative water source.
VENTILATION, LIGHTING AND COMFORT

The design of K’Jong addresses issues of heat, ventilation and comfort through the use of:

- The central courtyard design, drawing enormous amounts of light and air into the internal spaces
- Openings are adequately raised to capture daylight and designed wide enough for cross ventilation and lighting
- Extension of the eaves of the tile roof has allowed for a cooler micro-climate around the house by providing shade from the direct sunlight onto the walls
- The use of mud and clay bricks finished in adobe plaster has also ensured that the walls allow for a cool environment on hot days and retain heat in cold weather thus promoting comfort in the house

THE KITCHEN

Special considerations of the K’Jong towards a traditional African kitchen are:

- It provides a modern indoor kitchen connected to an outdoor paved patio that acts as an exterior kitchen
- It's located at the back of the house, allowing for more private cooking activities and serving
- The mud-brick paved court also opens out to a backyard garden that may be used for periscope or horticulture and gardening as well as provisions for sanitary activities or modern day services such as laundry, water tanks, or septic tanks

COST OF THE K’JONG

The K’Jong has been designed to use available, low cost materials developed on site, which also requires limited maintenance. This has substantially lowered its per unit area cost to USD$200 and about USD$25,142 for 120sqm, an affordable price for a modern house of its size.

SELLING POINTS OF THE K’JONG

The K’Jong is a comfortable home, reflecting traditional approaches with all necessary amenities to serve the needs of a modern lifestyle. It is artistic, beautiful and allows for the creation of uniqueness and personal identity of any homeowner as seen of African cultures and lifestyles in traditional architecture. The house has been designed with beautiful materials, making it an affordable, and a modern concept with low construction and maintenance costs as well as sustainable approaches.
STUDIO MANYATTA
CPDI AFRICA 2015 SUBMISSION

THE K'JONG HOUSE
A House inspired by the Karamojong tribe in Uganda

FLOOR PLAN
Scale 1:50
TATA
by Tan Boon Chiou
Architect | Japan

HONORABLE MENTION
Inspired by the vernacular architecture of the Tammari people of Benin
DESIGN CONCEPT

This design draws its inspiration directly from the tata somba, two-story huts built by the Tammarí people of northwest Benin. The tata huts original structure highlight familial congregation and protection signified by encircling high walls. This layout consists of multi-story tubal chambers that interconnect with other chambers creating a space of continuous communal flux.

PLAN AND LAYOUT

In order to capture the same essence of interconnectedness evident in the traditional tata somba layout, the more modern plan includes peripheral chambers that surround the central focus point in the congregation of huts.

This plan promotes a harmonious lifestyle by providing ease of access to exterior spaces such as patios and courtyards in order to experience the exterior landscaping. Along with ease of access, the simple banco facade and the varying height of the tubal towers and walls also help to create a harmonious symphony with the background landscape.

This layout calls for the use of high walls that was initially intended to protect the community from intruders, now used for protection of living space privacy. Low wall fencing is also introduced to this design and is used to border the courtyard. The use of low walls promotes neighborhood wellness which was a feature previously lacking in the traditional build but is now necessary in modern urban settings.

MATERIALS AND AESTHETICS

Traditional mud-brick, also known as banco is used as the primary construction ingredient for the huts, with an added 8% of cement. The cement is added to stabilize the compound of mud and straw to prevent erosion, increase durability, and reduce the need to reapply the plaster.

The color scheme of the huts often complement the natural mud brown color of the banco. The cubic theme of the gate design echoes African motifs by aligning various square geometries into the traditional patterns.

APPEALING POINTS OF TATA

The design seeks to modernize traditional Tata Somba designs by invigorating the traditional construction expertise as well as revamping old knowledge of material usage and space allocation. The huts also exude modernity in aesthetics and function ranging from form, color, privacy, and comfort.

The widely abundant building materials used, such as mud and straw, allow for the continuous benefit of low cost materials, in addition to increasing the longevity of the structure. The rooms are also designed with multiple door and window openings allowing for passive ventilation heat reduction.
SHEBAXUMITE

by Liuel Hizikias Ketema
Architect | Ethiopia

HONORABLE MENTION
Inspired by the Axumite people of Ethiopia
INTRODUCTION
The Kingdom of Axum, also known as the Axumite Empire, was a trading nation in the area of northern Ethiopia and Eritrea, which existed from approximately AD 100 – 940. It grew from the porto-Axumite Iron age period c. 4th century BC to achieve prominence in the 1st century AD, and was a major player in the commercial route between the Roman Empire and Ancient India. The Axumite rulers facilitated trade minting their own Axumite currency and the state established its hegemony over the declining Kingdom of Kush. It also regularly entered the politics of the kingdoms on the Arabian peninsula, eventually by extending its rule over the region with the conquest of the Himyarite kingdom.

Most Axumite structures such as palaces, villas, commoner’s houses and other churches and monasteries were built using alternating layers of stone and wood. The protruding wooden support beams in these structures have been named “monkey heads” and are a staple of Axumite architecture and a mark of Axumite influence in later structures built throughout Ethiopia including a symbolic design on the rock hewn church of Laliela. Contemporary houses were one-room stone structures, two-story square houses, or roundhouses of sandstone with basalt foundations. Villas were generally two to four stories tall and built on sprawling rectangular plans. A good example of still sanding Axumite architecture is the monastery of Debre Damo from the 6th century.

INCORPORATED AFRICAN DESIGN CONCEPTS
Among the various possibilities of African designs and design concepts, there are few that stand out of the crowd. One can observe the repetition of design concepts throughout all African designs. For example, the use of open spaces in the middle of the house, which is used as an extension for the functions surrounding it, and the use of elevated spaces (+ 2.50m) for sleeping purposes can be widely observed throughout the designs in Ethiopia.

A particular architectural design element used in the Axumite architecture that has been incorporated in the CPDI design in more or less abstract ways is the monkey head design. The extrusions of the wood from the wall are depicted in the design in an abstract interpretation which uses other cultural patterns and motifs which extrude from the wall.

TRADITIONAL AESTHETICS
The rock hewn churches of Laliela have very interesting characters of their own in addition to the impressions of Axumite architecture. Among those characters, the color of the rocks from which the churches were carved out from have a lasting and impressionistic effect. Another character used in the design which is found in both Axumite architecture and the rock hewn churches of Laliela is the ‘rule of equal-equal’. This rule is the reason for all the proportions in the Axumite architecture. This rule implies the subdivision of wholes into equal parts and it can also be applied for repeated divisions ‘middle-middle-middle’ which generates the number series, 1 – 2 – 4 – 8 – 16 – 32 and so on.

The masonry construction method of the Axumite architecture is also used in the design in order to enrich the material flexibility of the design. By using a combination of rammed earth and masonry construction, which are the two major construction materials in Ethiopia and further more Africa, it is possible to achieve the traditional aesthetics and ethnic reference used in the inspiration of the design.

The traditional clothing of the Axum region locally known as ‘yehager libs’ has different and distinctive patterns. These patterns are used in some contemporary designs as a source of inspiration and aesthetics. The infinite variety of patterns and geometric arrangements give way to some distinctive architectural characters for Ethiopian design.
DESIGN MATERIALS AND CHARACTERISTICS

Courtyard space is intended to be the extension of the surrounding functions especially the kitchen. The concept of ‘African kitchen’ revolves around the use of the exterior spaces in order to perform tasks that can’t be undertaken in the interior space. The courtyard space provided in the design, which has direct access to the kitchen and all the major functions, becomes an extension of the interior space for tasks that might need additional spaces. This concept is rather familiar to most designs in African which consider the exterior space as an extension of the kitchen since most kitchen related activities are done outside rather than inside.

Thermal control would be via masonry fencing and stabilized rammed earth walls. Both materials used in the design have high thermal mass that allows it to absorb heat during the day and release it at night. This moderates daily temperature variations and reduces the need for air conditioning and heating.

The foundation is constructed from stone strip foundation. This method was used in the original Axumite design as well. The roof is constructed out of timber beams and compressed earth. This construction allows for water proofed green.
GROUND FLOOR
FIRST FLOOR
NORTHERN PAFTA
by Gebrekidan G. Debre
Architect | Ethiopia

HONORABLE MENTION
Inspired by the culture of the Konso people of Ethiopia
DESIGN INSPIRATION AND SPATIAL ARRANGEMENT

The original inspiration of the design is from the KONSO people’s specific house typology construction called “PAFTA.” The Konso People live in Ethiopia about 600 km south of Addis Ababa. They Speak Afan Konso. The main Ethiopian Rift Valley of the Great East African Rift valley system ends here at Konso.

The “Pafta” are constructed on stone platforms that attain ~80cm high. They are built on thick poles (number between 8 and 12) of hard wood. The niche is located in the higher section between 100 cm and 150 cm above the ground and lined with timber from one end to the other. A small opening is left in the middle just near the central pole, which also serves as a ladder to access high into the niche.

The spatial arrangement is based on a typical, traditional, African way of life. Mostly in rural areas, families gathered around the cooking fire in the middle of the house. Specifically in Ethiopia there is always a coffee ceremony morning and night where all family members attend. In my design I accentuate the importance of this central spot (space) in the house both physically and programmatically by integrating it as a central interior courtyard that has strong connection with all the remaining spaces. It functions as a gathering space, celebration space, and dinning space both formal and informal (for special days the fire place can serve as a grill to cook meat) and the open fireplace gives warm environment for the spaces around. Here the central pole from the original “pafta” is removed and the surrounding pillars are extended up to the top.

The transformation of this typical typology “pafta” into modern form is accomplished using original Ethiopian pattern called “tibeb”. I implement this pattern both as a decoration element on the facade and on the overall form of the house as a space-organizing grid (pattern). The angular character of the pattern transforms the curved (circular) space into orthogonal shape which accommodates modern furniture and fixtures easily.

Tibeb is a very colorful pattern mostly composed of diamond shapes forming a cross. Mostly Ethiopian women from northern Ethiopia, specifically Amhara and Tigray regions, wear this dress.

MATERIAL PROPOSAL

Conceptually, the materials used are ordered hierarchically in terms of their weight and construction technique needed.

- Foundation: Stone masonry
- Frame: Wooden plank
- Walls on the Ground: Rammed earth (up to 2 m high), and timber (above 2 m)
- Interior walls: Rammed earth (up to 2m high) with plastering and waterproof finish around wet areas, and timber (above 2 m)
- Top floor: Wooden frame structure with waterproof layer
- Roofing: Wooden structure with clay slates
- Fenestration: Wooden frame and specifically designed patterns on RHS steel

All spaces have exterior openings that help to intake cool air from the surrounding areas and exhaust warm air through the wood strips at the top. The central courtyard is cross ventilated by the openings in the opposite direction and the opening at the top.

NATURAL (PASSIVE) AIR CONDITIONING SYSTEMS

All spaces have exterior openings that help intake cool air from the surrounding and exhaust warm air through the wooden strips at the top. The central courtyard is cross ventilated by the openings in the opposite direction and the opening at the top.
The stone masonry and mud construction of the walls serves as a thermal mass which increases the heat capacity of the building. This helps to regulate the internal spaces to an optimum temperature, one by maximizing the heat lag, and two by absorbing the heat during hot hours and releasing slowly during cold times.

**CONSIDERATION TAKEN FOR FUNCTIONALITY OF AFRICAN KITCHEN**

Since most African foods are spicy and pass through lot of preparation and cooking steps, there is always release of unwanted smoke and smell. Because of this I divide the kitchen into two attached spaces. The first one is an enclosed space where all intensive cooking process takes place. The second one is more interactive and open to the courtyard. It is a place where light foods such as juice, vegetables prepared and by heating already cooked foods will be served on the breakfast counter.

**SPECIAL PREFERENCE FOR AFRICAN HOMEOWNERS**

First of all it is a space that can give him/her a chance to live as his/her ancestors did, but in a modern way. So the client is not expected to compromise his/her traditions to fit in to this building. Rather, they will live with maximum psychological and physical comfort since it is specifically designed based on an original, African way of life. It is also designed and articulated with indigenous African patterns and building materials so his/her siblings and children will develop a sense of appreciation and confidence for their culture rather than admiring western (outside) culture.

**UNIQUE FEATURES FOR BUILDING CODE**

The fenestration pattern with vertical gardens could be taken as a facade design and developed into opening design regulation with rations and proportions developed.
MEZZANINE FLOOR
DESERT WAVE
by Omelchenko Alisa & Ksenia Bilyk (BOBObureau)
Architects & Designers | Ukraine

HONORABLE MENTION
Inspired by the vernacular architecture of northern Nigeria
ETHNIC GROUP INSPIRATION

Nigeria lies in Western Africa, with its southern coast washed by the waters of the Gulf of Guinea. This defines the country’s major architectural peculiarity and objective – to shield homes from extreme daytime temperatures and to make the terrain livable. It is the land’s climate which is mostly responsible for the form and shape of the buildings.

Because architectural traditions of northern Nigeria fully depend on and are inspired by its nature and environment, the materials, shapes, colors and decor are all identified by the distinctive character of life in the land. Its unique style is developed on seemingly arid soil.

There are two principal climate sub-zones in Nigeria. Along the coast, the temperatures and humidity levels remain high throughout the year. Inland, temperature variations depend on the season, and humidity levels are lower. Accordingly, the country comprises of two major territories, each with its specific civil engineering and construction. This project is designed to suit the dry and hot conditions of inland Nigeria (north), where living comfort calls for “self-contained” dwelling structures, providing sufficient shielding from excessive sun exposure.

TRADITIONAL ARCHITECTURAL ELEMENTS INCORPORATED

This design was mainly inspired by the traditional architecture of north Nigeria. Among the most typical features are: massive, solid walls with small window openings; south- or north-facing habitable rooms, toilets and bathrooms located along periphery walls; open fire cooking zones typical of the African kitchen, separate from the living zone.

The idea of this design is to contrast the ‘oasis’ inside the dwelling and its ascetic facade merging with the uremic environment. Space-wise, the design refers to the traditional geometry of inland Nigeria’s architecture, dominated by square and rectangular shapes. The cylinder, which we integrated into the design, references the shape of sacral African constructions and rondavelles. The floor area is divided into a private recreation zone and a common guest zone by the traditional impluvium, which refreshes both zones simultaneously.

TRADITIONAL AESTHETICS

The exterior walls, built from mud brick, lend the entire design a peculiar African feel and aesthetic, practically without using any other decor or ornamentation. The principal front was designed as a rhythm-making dead wall with vertical elements imitating sand-drifts and dunes. The wavy structure references the movement patterns of a caravan, the wind, or a reptile making their way through the desert. The structural shape of the wall turns the sunlight into an intricate pattern of shades and shadows, while also performing a practical task – shielding the building from the hot sun as if behind a screen.

The lateral facade continues the minimalist appearance of the exterior of the building. The windows here are arranged as a sequence of narrow openings, which give an impression of a colonnade resembling the temples of ancient Egypt. The cylinder (the rondavelle) is decorated with timber studs projecting throughout the entire surface of the wall. These elements are quite typical of African architecture as structural carriers whose edges form an original decor on the facade walls.

BUILDING MATERIALS

The stone base of the foundation rests in the dips/holes, made in the soil and rammed with lime. The structure of the building includes the traditional load-bearing walls, made from compressed, stabilized blocks. As the primary materials, organic mud-brick was used as one of the most viable, reliable and lasting natural
construction materials for this matter. Abundance of argillo-arenaceous soil in the area accounts for the wide use of the material as it also helps to reduce construction costs for those living in the hot and dry African climate.

The interior walls are plastered with a mix of sand and clay with straw and other dry binding agents, for better thermal insulation. This plaster mix may be easily applied, even by the hand, which will lend the walls a vivid roughness and relief. This type of mix is not as strong as the chemically bound cement plaster so it requires lime or asphaltic binder if used for exterior walls. The roof is constructed of load-bearing concrete beams along the entire width of the ceiling, connected with wooden beams, which override the open spaces in the guest zone. Every room is furnished with skylights, which other uses includes vertical ventilation. The impluvium is specifically designed to collect rain water.

HEATING, COOLING, VENTILATION AND AIRFLOW

The issues of heating, cooling, ventilation and airflow are resolved through the use of natural and organic materials. Firstly, the thick mud brick walls keep the indoor premises cool. The dimensional design of the building is cubic which, combined with perpendicular location of windows, allows for air-flow. Another important feature is the perforation of the roof – partial in private rooms, via the skylights, and complete in the guest zone or living room zone.

THE AFRICAN KITCHEN

The African kitchen is a significant traditional element in this design. Its placement and layout conform with safety and venting regulations, as the periphery wall is perforated and allows for removal of kitchen odor. The kitchen area contains the classical cooking block alongside the traditional African kitchen and is fully separated from the residential area of the house.

WHY A PROSPECTIVE HOMEOWNER WOULD CHOOSE THIS DESIGN

In this design, emphasizes is placed on the beauty and uniqueness of African architecture, with as much subtlety, modernity and affordability as possible. The main idea is to focus on the interior space -- to make it ultimately diverse and varied, yet affordable. It is not another regular house; it’s about today’s interpretation of traditional African architecture – ornamental on the outside, and functional on the inside.

FEATURES THAT COULD BE BUILDING CODE

The unique peculiarity of this design is the wavy wall which is an interpretation of regular clay walls, common in Africa. The wavy shape is the reflection of naturally uneven shapes typically present in manually built houses. In this design, this feature combines functionality and decor. It is believed that such reference to tradition lends purity and subtlety to both form and structure.
THE MENA
by Julia Mauser, Girum Solomon & Minasie Terefe (Konso)
Architect | Ethiopia --- Architect | Germany --- Architect | Ethiopia

HONORABLE MENTION
Inspired by the Konso people of Ethiopia
CONCEPT

Africans possess the unique and abundant examples of living together with cultural richness, responsiveness to climate and environment in ways full of life and history. Africans are social beings, breathing and beating in unison.

Mena, named after the maternity housing typology in Konso, reflects an urban imitation of this belief, taking inspiration from the UNESCO recognized values and practices of the Konso people of Southern Ethiopia. It marries rural forms and concepts with the urban need and environment. It creates a place to live, a space to work, and a community to grow in by preserving the ideas of treasured cultural spaces and giving them new and exciting contemporary interpretations. It is more than just a residential unit; it is a contemporary urban homestead (tigalia).

This proposal consists of a series of centers, shared by different age groups, ethnicities and religions, carefully placed so that each individual has personal space to lead everyday life, yet concurrently share a larger common space, an infrastructure built for the multiple that is meant to stage the embodiment of all shared experiences. The contemporary African residence is, in opposition to many western examples, never a single house, but consists of multiple dwellings that are strongly linked by colorful social values and family traditions and courtyards.

WHY KONSO?

The people of Konso have developed a unique and incredibly sophisticated way of living together in a very remote area of Ethiopia. They have lived in isolation for a long time, which has made them experts in response to their environment, their use of natural resources and their social living form – all expressed in their architectural forms. There is an abundance of traditional elements to learn from, but this proposal will focus on three components, the most crucial elements for a prototypical homestead in the urban context.

• Terracing as means of optimizing space: Their architectural integration into their surroundings has made them strategic in living in confined spaces – an important asset for the ever-stretching African cities built today
• Duality and Symbols: each surface and building element has more than one function – live and work spaces, storage and stairways, landscaping and feeding the human and the animal
• Sustainability: the people of Konso have developed unique responses to their environment, in particular their irrigation system – water – a crucial survival aspect in the modern African city. How can we make use of scarce resources in the urban context?

TERRACING

Konso farmers are threatened by continuous erosion from their fields and have perfected the art of stone terracing, which is unrivaled anywhere in Africa. Its function is to maximize water retention and infiltration. At the same time, it is very effective in preventing soil erosion. This proposal takes the concept and makes use of an urban garden on the building’s surface, under the windows, on top of the lower terraces and even higher up making sure there is space for plants to grow – some naturally, some intentionally planted to cool the surface of the building. The raised platform provides space for the main family house and other functions related to it. The homestead is always divided into an upper level (oida) and a lower level (orchata). The raised platform is used to celebrate the coffee ceremony in the interior, a cultural heritage for the entire country of Ethiopia. Also, a mezzanine floor is introduced that provides a more intimate space for prayers and can be used as a guest room.
Exterior terraces have a structural purpose. They are made out of local stones and can act as rainwater retention elements, flower pots and seating areas. Additionally, they are an integrated landscape feature for the outdoor activities like washing and drying clothes, outdoor cooking and much more.

**DUALITY AND SYMBOLS**

The Konso people use different natural products (fruits, eggs, etc.) on their roofs and walls to decorate and tell a story, with elements that are rich in content. Different crafts made for the home, like pots on the top of the house, can show you who is living in that hut. At the same time they have a series of shared spaces; e.g., two to three families share a kitchen hut to provide a social interaction space while preparing food.

With the same principle of aesthetics and functionality, herbs and vegetables are used to create a unique design on the walls while at the same time provide numerous by-products for household uses, taking a big leap forward in sustainability.

Careful attention is made to propose important and solely African programs. Programs like the coffee ceremonies, the outdoor kitchen for larger celebrations, and the shared and common spaces are all important communal and traditional spaces, often lost in the city. Accordingly, this design layout best accentuates these communal spaces and draws attention to the core from which every other program radiates out.

Additionally, there is adjustable furniture to allow the space to breathe and change. When entering the house, there is a sideboard that can work as a windscreen, a space for putting coats and dirty shoes. From the opposite side, there is a mechanism that can pull out the dining table to sit about six to eight people. Above all, this is another approach to shared spaces – a true identity of Africa.

**SUSTAINABILITY**

Apart from the water recycling systems, there was a conscious effort made to choose a material first, and then develop the form according to material properties. Though Konso is known for its engineering ingenuities, timber was not the right choice of material, especially considering the mass falling of trees in the area today. Consequently, earth is used in order to model the entire house with the same material (the foundation is a stone with minimal mortar where needed). The upper walls, roof and vaults are sun-dried earth blocks only. They are modular and portable which makes them easy to recreate and build with local laborers.

Further, earth is ideal for controlled natural ventilation and air-conditioning -- cooling during hot summer days, and retaining warmth during the night. The curving nature of the building also aids the collection of rainwater in the tanks below and simultaneously supports internal natural air flow.

Finally, the materials and shapes chosen are to minimize cost for the maximum space. Clay is easy to get in many parts of the country so it is cheap and the bricks can be made with a brick mold machine that can be borrowed or bought for the construction process.
NOKTECTURE
by Ojile Ameh Godwill
Architect  |  Nigeria

HONORABLE MENTION
Inspired by the Nok terracotta
DESIGN INSPIRATION AND SPATIAL ARRANGEMENT

Overall Concept

Major inspiration for my design prototype has its roots from Africa’s number one and most magnificent art form of the ancient civilization Nok (500BC-200AD) and their art. The civilization inhabited the central parts of the Kaduna state, modern-day Nigeria.

Nok art was known for its figurines especially. The terracotta statuary of the Nok culture is a classic art style whose sudden appearance has radically challenged the traditional art history of African sculpture. Two characteristics are central to our design prototype. They include in the piercing of the pupils, the nostrils, the lips and the ears, and the treatment of the eyes, which form either a segment of a circle or sometimes a triangular form, with the eyebrow above balancing the sweep of the lower lip. In the prototype, windows are representative of eyes (pupils) and doors of mouths (lips), which take triangular/circular form.

The layout of the plan is inspired by many African cultures. However, a unifying feature is the popular courtyard setting, which is the focal point for the rest of the house’s functions. In particular, the Hausa culture of northern Nigeria, by virtue of Islamic influence, portrays a housing setting that is based on gender segregation, hence the need for adequate zoning of the women’s area from the public areas. We included the “zaure” beyond which visitors do not intrude. Visual privacy is important to protect the family, especially the female members from the sight of male strangers.

Roof Eave and Exterior Finish/Decor

The Zulu hats or “isicholos” are the inspiration for this aspect of the design. These hats originated from Kwazulu Natal, the stronghold of the powerful Zulu nation of South Africa. These hats are traditionally worn by married women for ceremonial celebrations. They are hand woven from cotton, rope, or vegetable fiber, dyed with ochre, and covered with a basket frame.

Space Planning

The plan adopts the polygamous setting that is predominantly practiced in African. Hence the women’s area has been delineated and bordered by an accordion door that can be opened to allow for a larger communal space during events. The spacious living room, which dissolves into a sitting room, dining room, or others, can also borrow space from the foyer in the event of a larger celebration. However, functions can still be separated with the aid of sliding particleboard partitions.

The dining room has direct access to the outdoor kitchen and can dissolve into the courtyard where traditional delicacies can be enjoyed away from the conventional dining area. Fins provide a visual appeal to the courtyard and block the view of the women’s area, allowing for communication but not viewing.

COURTYARD

The courtyard acts to enhance lighting and thermal comfort through the stack effect ensured through the use of low and high level windows. It provides the ideal space for socio-cultural and day-to-day activities such as eating, sitting, family gathering, and children’s play. It simply represents a place where family can exist in a self-contained manner.

INDOOR AND OUTDOOR KITCHEN

The outdoor kitchen (African kitchen) is located within the courtyard with access to the dining room for ready movement of delicacies or the courtyard to be enjoyed. The interior kitchen walls are enveloped with brick walls particularly to help reduce the effect of heat that’s generated. The outdoor kitchen is made
out of natural stone that is cheap and has good fire resistance and fortification and can be sourced from the local environments.

MATERIALS

Foundation and Walling Systems – burnt brick, hollow block work and natural stone
Flooring – rammed earth
Shading at Entrance – bamboo
Roof and Eaves – corrugated iron sheets and recycled wood

UNIQUE FEATURES THAT CAN SERVE AS BUILDING CODE FOR CONSTRUCTION IN AFRICA

Windows and Doors – to be represented as perforations with triangular or circular cuts
Courtyards – to be surrounded or built by movable or demountable partitions, not permanent ones, to enable transformation and flexible use of the space

POTENTIAL COST OF DESIGN

The approach toward design, construction and building materials are met with sustainability in mind. For instance, techniques for construction are simple and can be easily taught to involve community participation and hiring of cheap labor. Building materials that are cheap, yet of good quality with reduced dependence, on carbon were specified. After due cost considerations, the potential sum of the design prototype arrived at about N750,000 (Seven hundred and fifty thousand Nigerian Naira).
AMAI
by Gratio Ray, Kevin Yamaputra & Cynthia Javanny (Achromatic Design)
Architects  |  Indonesia

HONORABLE MENTION
Inspired by the people and culture of Zimbabwe
A mother is the truest friend we have, when trials heavy and sudden fall upon us; when adversity takes the place of prosperity; when friends desert us; when trouble thickens around us, still will she cling to us, and endeavor by her kind precepts and counsels to dissipate the clouds of darkness, and cause peace to return to our hearts. – Washington Irving

INTRODUCTION

Everyone in the world has a similar, fundamental understanding about a home. This conception is projected in an ambiguous phenomena of physical and psychological simultaneously marks the existence of home in human life. As a physical space, a home is defined structurally as a constructed space or building. Psychologically, a home is a sanctuary of life; a place where people seek safety from many surrounding problems.

What is a home, if not a shelter from the storms of life? Safety and security are the core aspects of the conception of home. In order to design a prototype, the understanding of the African philosophy and culture, which holds symbolic value to their everyday life, is prior. For example, physical objects such as arts and craft, working tools, and architecture are internalized philosophical and symbolic representations of traditional beliefs and culture. Needless to say, homes have deep value and meaning, as it contains the fundamental aspect of human life.

Research to find cultural and regional examples lead interest to the dry Southern Africa, particularly Zimbabwe. In Zimbabwe, there are distinctive ancient masonry craftsmanship and materiality that are different among other regions of Southern Sahara where mud clay is the key material used to build.

SPIRITUALITY OF MOTHERHOOD & CRAFTSMANSHIP IN ZIMBABWE

Imba Huru, known as the Great Enclosure, is Zimbabwe’s crowning achievement and Africa’s largest masonry structure by the Shona Civilization.

There are some special characteristics of spatial configurations among dwellings in ancient Zimbabwe, as seen by examples of the Imba Huru, Nalatale, and Khami Ruins. They each form an enclosure forming the womb of a pregnant mother. In this context exists a close relation between the conception of a mother and a home. Remembering that the function of a house is to provide safety and nurture the home owner, these points inspire architects to bring the spirit of motherhood through the expression of architectural design.

DESIGN PROCESS

Reinterpreting Traditional Form to Modernity

The design needs to achieve 3 goals: aesthetic appeal, functionality, and cultural value. Therefore, the design approach needs to embody the holistic transformation of traditional to modern language.

The challenge for architects today is to avoid naively replicating the traditional form, while still maintaining the traditional value, spirit and culture through modern architectural expressions.

When studying the fundamentals of living, there are two basic aspects: harmony and security. The symbolic expression of Adinkra Aya refers to resourcefulness and endurance, and Kete Pa of good bed and marriage (harmony); both are to be reinterpreted as pattern building elements.

SPATIAL PROGRAM

This design aims to create a prototype of a small, modest home yet contains the fundamental needs for modern living. The indoor space is divided with semi outdoor space for the needs of natural lighting and ventilation.
The flexibility of the living room, dining room and kitchen gives more possibilities to hold social activities. This social aspect defines the African kitchen as a traditional identity in a modern language for African houses.

STRUCTURE & CONSTRUCTION

The construction and materials are considered to be as simple and as low cost as possible. The materials are chosen by the local availability and simple assembly method, without devaluing the aesthetics and functions of the building. The wall construction is mostly made of cob wall which is earth based material supported by concrete structure. The concrete roof, chosen for its durability, functions to catch rainwater and store it as secondary water supply. To prevent cracks and heat absorption in summer, the surface is covered by locally available thatch and gravel to avoid the heat directly touching the concrete surface.

SUSTAINABILITY: WATER RECYCLE SYSTEM

To enhance efficiency of daily water usage, this design will apply a system to reduce, reuse, and recycle rainwater and waste water

CONCLUSION

Africa has is rich in culture, beliefs, and other traditional values that depend on the characteristics of the local environment. This proposal is a prototype to offer an alternative approach to give a modern language to traditional African Architecture.

This proposal also offers the idea of a modest and low cost architecture possible for a house. This house would express intimacy, modesty, and simplicity that nurtures the home owners to live and grow, and shelter them in safety like a mother loves her child. Therefore, this proposal is named “mother”, or AMAI, in Shona Language.
THE GOJO
by Kalkidan Tesfaye, Filimon Teshome & Hundaol Girma
Architects | Ethiopia

HONORABLE MENTION
Inspired by the Sidama of Ethiopia
INSPIRATION

The design is mainly inspired by a traditional house of a native tribe found in Ethiopia called Sidama. The dome form is not exclusive to the area because it is found all over Africa. It’s a form Africans can relate to. The form responds to the tropical climate and has characteristics of hot-climate region African architecture. We have incorporated natural elements like vegetation with the architecture so that it doesn’t act like a foreign object in a site but, as a part of the life-cycle while adding to the aesthetic quality of the house.

ELEMENTS OF AFRICAN ARCHITECTURE INCORPORATED IN THE DESIGN

- Dome form
- Courtyard
- Outdoor kitchen
- Outdoor family gathering area (for coffee ceremony)
- The mashrabiya opening style found in northern Africa
- Small openings

AESTHETICS SOURCED FROM AFRICAN TRADITION

Basic colors found in the lifestyle of Africans and colors that have symbolic significance and a rich message (red, green, yellow, and beige). Weaving textures found in day-to-day activities and in artifacts of African tradition.

BUILDING MATERIALS

- Foundation: Stone strip foundation
- Wall: Bamboo poles with bamboo weaving finish
- Roof: Thatched roof with bamboo weaving cover
- Openings: Tinted glass
- Structure: Load bearing burned mud block
- Cantilever Structure: Wood
- Floor: Wood plank

HEATING, COOLING, VENTILATION AND AIR FLOW

- Intermediate courtyard for stack ventilation
- Incorporating vegetation for air quality of the spaces
- Protruded windows to avoid sun radiation
- Roof top small opening for removal of exhaust air

SPECIAL ATTENTION TO ADDRESS THE FUNCTIONALITY OF THE AFRICAN KITCHEN

Most of the activities in African kitchen require both indoor and outdoor spaces, thus we have provided an outdoor kitchen. The outdoor kitchen is directly connected to the outdoor family gathering area. The indoor kitchen is also directly connected to the serving area for accessibility and ease of work flow.

WHY A PROSPECTIVE HOMEOWNER WOULD BUY THIS HOUSE

- The form is extremely easy to construct
- The construction can be completed in a very short time,
- It can be built with local labor (doesn’t need highly skilled man power)
• Only local and sustainable materials are used, avoiding the unnecessary cost of importing industrialized materials and contamination of the ecosystem
• The architecture and the space quality resonates with the beauty in the diversity of African tradition and delivers a message that African architecture can be a functional and effective trend without compromising the aesthetics

**UNIQUE FEATURES TO BE CONSIDERED AS A BUILDING CODE**

Minimum one tree has to be incorporated with the building by a means of semipublic space.
JALI
by Miracle David-Adjah & Bismark Achodo (BMA Design)
Architects | Nigeria

HONORABLE MENTION
Inspired by the music of Africa
The name, from a language of a group of West African countries; (Sierra-Leone, Mali, Guinea, Cote d’Ivoire) given to an oral historian-cum-minstrel-storyteller.

**DESIGN CONCEPT**

The Jali is a home not inspired by one African culture, but rather by a common lifestyle feature found in all African cultures. The concept of the design is African beats and rhythms. Music and dance is part of the lifestyle of all African cultures. Traditional music in much of Africa is passed down orally and is not written. In Sub-Saharan African music traditions, it also frequently relies heavily on percussion instruments of every variety, including xylophones popularly known in Africa as “Balofon”, the drums, and tone-producing instruments such as the “mbira” or thumb piano. The Balofan, which forms the main facade for the building is actually a sacred instrument in some parts of Africa, such as the Susu people, a subgroup of the Mande ethnic group in Guinea.

**TRADITIONAL ELEMENTS USE IN THE JALI DESIGN**

The design infuses several elements from the traditional architecture of many African ethnic groups, from spatial arrangement to construction materials and aesthetic features. Some of them include the conspicuous front entrance and another separate back entrance in the spatial arrangement, like the homes of the Yoruba people. The art of the Zimbabwean sitting stool forms the elaborate entrance of the house; it is common for the Yoruba houses to have elaborate entrances. The Hausa people used Adobe (locally termed tubali) in the construction of their traditional houses and plaster with earth. Walls constructed with mud/earth formed hollow blocks to keep the heat out. The Igbo traditional architecture has several units that surround the obi, (the compound head’s hut). This is also found in some other African cultures like South Africa, Mali, and Burkina Faso where the men traditionally had more than one wife. This translated to the bringing together of spaces (different units) in the house by the courtyard. Irrespective of culture and tradition, the lifestyle of many Africans encourages togetherness which too encourages the courtyard.

**BUILDING MATERIALS USED IN THE JALI**

The Jali celebrates the local materials readily available in Africa. The materials used are however a blend of the modern and traditional to achieve maximum sustainability. The building materials can be substituted as suited to the region it is to be built in.

- The roof uses brown Aluminum long span corrugated roofing sheets.
- The walls are constructed with compacted or rammed mud (earth) blocks. The earth and mud must be compacted to increase the tightness between the molecules of sand, thereby preventing water from seeping in and ruining the walls. The walls are plastered as normal with cement mortar to keep the mud as air tight as possible.
- The entrance canopy is made of African Cherry (Prunus Africana) wood also known as Red stinkwood. The tree of the African cherry is an evergreen tree native to the mountain regions of sub-Saharan Africa and the islands of Madagascar, Sao Tome, Fernando Po, and Grande Comore. Because it moisture tolerant it will hardly be affected by rain. The wood is tough, heavy, straight-grained, and pink, with a pungent bitter-almond smell when first cut, turning mahogany and odorless later. It is very strong and useful even in construction of bridges and as such is perfectly suitable for the entrance
canopy. Its pink color compliments the wall motif. The entrance canopy uses cane (raffia) as the roof covering. This draws in inspiration from the elephant grass used in the north and the dried palm fronts used in the south as roof covering material. It can be substituted with either as is applicable. The cane (raffia) is rubbed with tar to keep the moisture out.

- Bamboo is used in the construction of the walls of the courtyard. It is also used as a sun shade in the courtyard. Bamboo is a strong grass species that grows fast and is easily replenished. It is dried, treated (seasoned) and polished to give it a modern feel.
- The windows, as with modern buildings, use glass sliding windows.

TACKLING THE HEAT, COOLING, VENTILATION AND AIRFLOW PROBLEM

The Jali responds to the thermal conditions of Africa by using the mud blocks which are natural heat insulators. Within the home, all frequently used spaces are well ventilated.

When cooking African-style dishes, there is always a large amount of smoke and heat and therefore, traditional African homes had kitchens located outside. In many contemporary houses, kitchens are inside, making it uncomfortable to cook African style. However, the Jali provides a well-ventilated kitchen with a terrace for outdoor cooking. This allows for the African kitchen in a contemporary house. There is also direct access from the kitchen to the courtyard. This will allow for ease of functions when the family gathers in the courtyard on a hot afternoon or cool evening.

WHY AN AFRICAN HOMEOWNER WILL WANT THE JALI

Most cultures are noticed or known by the kind of structures they live in. In Africa for instance, many fathers would say, “a structure in our days would tell you who owned the house. Even when the form is the same, a hunter would easily be noticed by the heads of as many animals he had killed on display in his house. A warrior: by the swords, cutlasses, bows and arrows and other weapons of war. It goes on and on for all African lifestyle types.” The Jali unifies African cultures with its design elements and aesthetic features because it celebrates and tells the story of the musical culture of Africa. It is a culture that most Africans can be proud of. When African homeowners understand the concept of the Jali, they will gladly use their houses to explain to other ethnic groups their cultural music story. In this way, African homeowners will pass on a part of their cultural heritage to others.

Apart from passing on a cultural legacy, the floor plan is simple and can be easily constructed. The building materials are locally available, hence affordable. The design celebrates the African lifestyle and merges it with the contemporary architecture of today. And in all, it is aesthetically appealing.
THE MASK
by Marina Ryleeva
Architect  |  Russia

HONORABLE MENTION
Inspired by the symbolism of the African mask
The project was based on the idea of traditional tribal masks that bear four traditional symbols that represent the house, or family. A strong family stands on these four pillars:

- **Mother (the hostess)** - homemaker
- **Father (the landlord)** - protector of family and shelter
- **Ancestors** - keeping the memory of deceased loved ones
- **Religion** - keeps the peace at home

The masks of four tribes have been utilized as influences for this project. These are the Chokwe, Masai, Ceva (Nanyang), and Dogon, and each use fulfills one of the four pillars of a strong family.

The Chokwe tribe lives in eastern Angola, the Democratic Republic of the Congo, and South Zambia. All Chokwe masks have similar features of protruding eyes with drooping eyelids, planted in large hemispherical orbit; and a chin groove or heavily decorated protruding appendage. Images from the Mwana Pwo mask have been used for the north facade to represent the Mother. All features of the mask can be traced in the detail of the facade. The entrance is in the form of nasolabial folds, and the naves and shape of the balcony in the form of almonds. The mask is a young woman who represents the younger generation of girls dedicated to the tribe into adulthood, ready for marriage. The laughter and joy of children fill the house, bringing comfort and warmth to the owners. The project brings home an aura of wealth and fertility, and connects the household with the spirit of the female ancestor, favorable to fertility and family happiness.

The Masai tribe lives on the savannah in southern Kenya and northern Tanzania and their warrior mask was chosen to represent the father pillar on the eastern facade. There are two features of the mask found in the facade: solid glass has the shape of an “X” that can be seen in the transition from the brow arches to the nasolabial fold, and the certain decorative elements can be found in the form of glazing.

The Ceva live in south-eastern Africa and have a god mask named Chautu that was chosen to represent the religion pillar of family on the southern facade. Chautu created all living things and the facade on the project acts as a portal between the worlds of the living and the dead. The visual resemblance between the facade and the mask can be seen in the glass balcony in the form of Chautu’s ears, and the roof that mimics the forehead wrinkles of the mask.

The Dogon live in the Republic of Mali and they utilize masks shaped like antelopes to communicate with their ancestors. The design of the mask includes a rectangular box with slits for the eyes and horns. The facade has the characteristic features of the antelope mask: windows with triangular folds to symbolize ancestors, pillony-sheds associated with upturned horns of an antelope, and an entrance door that creates the effect of the whistle.
SECOND FLOOR
UMOJA

by Mark Gomina
Architect | Nigeria

HONORABLE MENTION
Promoting a synthesis of African design
OVERVIEW

‘Umoja’ is the Swahili expression for unity. It is a sacred task in history attempting to formulate a multicultural, yet singular theme for modern African architecture. Just as the Latin phrase “e pluribus unum” means “out of many, one” and also describes the word ‘university’ as finding unity in diversity, this idea has informed my approach in general. Umoja becomes the melting pot that emulsifies the diverse ingredients of culture, aesthetics and sustainability.

INSPIRATION

Umoja design is inspired by the ‘Golden Rectangle’ or the divine proportion phenomenon seen in nature, art, architecture and geometry inspired by the unprejudiced decorative patterns of the Gurunsi people of northern Ghana and southern Burkina Faso. The decorative patterns symbolize the same diverse decorative symbols evident all across Africa.

CONCEPT

Umoja explores proportion and geometry research findings in regard to the Golden Rectangle. Most African vernacular, art, and architecture is characterized by intricate geometric forms, patterns, symbols and motifs; debunking any ideas that vernacular architecture is lacking in both identity and meaning.

The Golden Rectangle is a rectangle with its sides in ration 1:1.618 represented by Greek letter phi. 1:1.618 is also recognized as the “Golden” number, divine proportion, golden section, and Fibonacci’s constant.

TRADITIONAL ARCHITECTURAL ELEMENTS INCORPORATED IN UMÖJA

- Courtyard design strategically zoned for increased ventilation and airflow
- Integration of laundry-space alongside the kitchen which could also serve as a substantial local meal preparation area
- Functional plan which celebrates the carry-over rituals of most African residential cultures of having an ante room (with a visitors’ toilet) before gaining entrance into other spaces of the building
- Roof gutter system formed by the courtyard roof for water recycling

Traditional Aesthetics Sourced from Traditional Design for Exterior Finishing

- Reinterpretation of the motifs and patterns seen on the exterior of most Gurunsi buildings
- Natural, earthy color schemes that blend with nature

BUILDING MATERIALS USED IN UMÖJA

- Green colored Hydraform roofing tiles
- Hydraform wall bricks
- Hydraform foundation bricks
- Aluminum window frames with UV protective glazing
- Extruded polystyrene integrated foam for projected shading forms

HOW UMÖJA ADDRESSES ISSUE OF HEAT, VENTILATION AND AIRFLOW
• Deliberate window arrangements in room spaces for cross ventilation
• Courtyard integrated for effective airflow
• Strategic aligning of kitchen space and its windows to reduce heat and trapped smoke

WHAT MAKES UMOJA SPECIAL AND ATTRACTIVE TO PROSPECTIVE HOMEOWNERS
• The modular and gridded layout plan in constant intervals enables ease in setting out and construction.
• Umoja’s simple form is aesthetically pleasing using a regular and repeated roof slope to form a frame to the wall surfaces finished with motifs.
• Umoja pays homage to the modern African kitchen by building an area adjacent to the dining space to provide ample space to prepare, cook, and wash. Integration of laundry-space outside the kitchen which could also serve as heavy local meal preparation area.
• Availability of materials

The characteristics listed above of the Umoja are worthy of becoming a building code requirement for construction in Africa.
THE MUDINA
by Kseniya Mamaeva
Architect  |  Russia

HONORABLE MENTION
Symbiosis of African traditional design and modern technology
DESIGN CONCEPT
In the creation of my project, I studied the cultures of Africa, clothes and writing of African tribes, and the nature of African household objects. All of this is reflected below.

INSPIRATION
• The tiered headdress became the prototype for the main part of the building.
• African drums with different heights and shapes became the prototype for the vertical elements of the building.
• A circular lake in the crater of a volcano is a prototype for the reservoir around the building.
• The shape of African beads became the prototype for the shape of the base of the vertical elements of the house and the roofs.
• The form of the windows on the walls repeats the shape of patterns on African clothes.
• Geometric painting on traditional African homes became a sample drawing.

FIRST FLOOR
The kitchen is located towards the back of the building for privacy and serving. The kitchen has a patio for external or outdoor cooking, which is a very common African practice. The kitchen accesses the dining area directly for ease of serving food and for functionality. The dining room is combined with a sitting area.

SECOND FLOOR
On the second floor is a sitting room for joint pastime of people. The terrace is decorated with plants and is suitable for outdoor pursuits too.

THIRD FLOOR
The bedroom and dressing room are located on the third floor. In the hottest time of day, the curtains are closed in the room. You can open the curtains in the evening and admire the view from the window.

MATERIALS AND SUSTAINABILITY
• Building materials to be used for the entire building:
  • Roof – Bamboo trusses, brown shingles with the texture of wood
  • Walls – Hallow sandcrete blocks and wood
  • Foundation – Filled with concrete blocks

How the design addresses the issue of heat, ventilation, and airflow:
• The coolness of the water and the fresh air will pass through the many windows
• Tents made of cloth on the third floor can create a shadow on the second floor
• Terrace on the second floor creates a shadow and prevents the passage of sunlight on the first floor
• Special arrangements of windows contributes to good airflow
FIRST FLOOR
THIRD FLOOR
SAKHILE
by Nicole Nomsa Moyo
Architect | Canada

HONORABLE MENTION
Inspired by the culture of Ndebele and Zulu of South Africa
SAKHILE (WE BUILT) FEMALE

As a young Ndebele woman in a world that is ever changing and globalizing, it is through self-reflection that I know I need to take ownership of celebrating and building my culture and heritage. Sakhile, is a female Ndebele name meaning “we built”. The value of the name is deep rooted in its expression of how our African cultures have come to be. The evidence of what “we built” has been and continues to be created and conserved through storytelling, art and architecture. Sakhile is inspired by the Sub-Sahara based Ndebele and Zulu ethnic groups who traditionally lived in dome beehive shaped structures called “Huts”. The Sakhile house borrows its structural language of the indigenous huts, bridging the past and the present with a more modern, permanent, and sustainable selection of material translations and functions. Traditionally, Ndebele and Zulu tribes constructed their hut homes out of small tree trunks and branches that are placed in the ground in a circle. Construction techniques show that the branches are woven and tied with stripped bark to create a structural wall. Dry long grass is then used to thatch the roof tying the materials together. The vision of the Sakhile house is pure in its circular asymmetrical form and humble in its scale. The design is a threshold between traditional Ndebele ideologies, art, materials, modern technology, celebrations of architecture, and culture interwoven to initiate the evolution of modern African architecture.

FORM

The predominantly circular shape of the Sakhile House is of pure form. Traditionally, the shape reflects ideologies of connection to nature, physical and metaphysical experiences, universal light, and our interconnected existence to others. In the Ndebele culture most day-to-day interactions usually happen outside, however, the Sakhile House plans wish to demonstrate an internal interactive space that reflects a more modern-day culture. At the very center of the plan is the multi-functional living space. The living room is the most important feature of the house. It is open to the sky and acts as an internal courtyard that transforms as light and day-to-day functions such as family gatherings that animate the space. All the adjoining more private spaces, namely the kitchen, dining and study, and washroom and bedroom are connected to and meet at the center of the plan. The plan intentionally reflects a new architectural language with intermediate space that celebrates the importance of community and human interaction. Although the shape and architectural language of the Sakhile is borrowed from the Ndebele and Zulu tribes, the development of the design is strategically in favor of the circle, which will allow for maximum sun exposure throughout all seasons in all African countries. The modern day kitchen looks onto and engages with other spaces. The kitchen is elevated above the multi-functional living room and its open plan extends to an outdoor courtyard and entertainment patio.

MATERIALS

The materials selected for the design of the Sakhile House celebrate the visual aesthetics of sub-Saharan African identity. Materials were strongly developed on the research of Ndebele and Zulu building techniques, cost and accessibility, structural functions, and Earth tone colors. The architectural facade bridges modernity and cultural heritage. Red bricks are a popular building material in South Africa. The brick is a modern and more structurally sound clay-like material. The facade also incorporates patterns that can be found on traditional Ndebele architecture. The Sakhile house has an outlined pattern wall that acts as a “blank canvas”. This allows the owner of the home to have freedom in color selection of how they want to be represented, and that makes their home unique to others. Concrete is used for the stability of walls and the foundation. Ndebele dome construction materials are replaced with more whether-bearing and sustainable materials. Glass is used to create transparency and light, creating a relationship between internal and external environments. Most
importantly, the selection of the materials and the structural language of the house is intended for both men and women’s involvement in the aesthetic design and building process.

FUNCTION

Light, Heat and Ventilation

Traditionally light has always played a role in architecture, as the effect of light can dematerialize building materials, creating life-filled tangible and intangible spaces. The bases of traditional Ndebele hut design allowed for moderate air movement but minimal internal light exposure, limiting the functions of the home during the day and at night as simply a place to rest after dark. The use of natural light not only allows the internal spaces to have a direct relationship with the environment; in addition the light works passively to heat and animate living spaces. The house membrane is punctured with window openings and vents that are inspired in shape and form from transitional Ndebele and Zulu patterns. The Gabion wall technologically and passively heats the home. The air vents allow for passive moment of air throughout the house. The thatched roof is an architectural element, which breathes and was specifically reincorporated into the design of the house to allow for cooling to occur in both dry and humid temperatures.

Water

Developing countries have growing urban populations. Cities are becoming desired places to live. However, the speed at which the population growth is happening makes it difficult for governments and municipalities to deliver water as a basic human right and need. As architects, we have the ability to have a positive impact on all communities by insuring homes have alternative sources of water collection and storage. It is my proposal that by law all houses have a rainwater cistern connected to the roof as seen in the Sakhile design. Water is sacred in all cultures and societies. This, along with the entire integrity and design of the house, is fundamental to improving the livelihoods of all communities.

SYSTEMS

- Light: The Gabion wall is heated by the sun. The heat is then transferred into internal living space. This is a great architectural feature, especially in winter.
- Ventilation (Wall Vents): Inspired by Ndebele pattern and allows for passive and natural movement of hot and cold air.
- Heat: The Gabion wall is heated by the sun. The heat is then transferred into internal living space. This is a great architectural feature, especially in winter.
- Ventilation (Roof): Modern advancement of traditionally thatched roof “breaths” and ventilates the internal atmosphere.
- Rainwater Cistern: Harvests rain from the roof and stores water for on-site usage.

MATERIALS

- Exterior: Concrete foundation, brick, thatched roof, and stone veneer
- Interior: Wood and concrete
SAKHILE HOUSE FLOOR PLAN

TOTAL SURFACE AREA: 112 METERS SQUARED

1. ENTRANCE
2. COLONNADED PASSAGE
3. STUDY/CAN BE CONVERTED INTO ADDITIONAL ROOM
4. INDOOR COURTYARD/LIVING SPACE
5. KITCHEN
6. WASHROOM
7. BEDROOM
8. OUTDOOR COOKING SPACE AND PATIO
9. UNCOVERED GARAGE
10. PLANTERS
11. DINNING ROOM
EBUSUA FIE
by Dahlia Roberts Nduom
Architect  |  Ghana

HONORABLE MENTION
Inspired by the Fanti of Ghana
TRADITIONAL INSPIRATION

_Ebusua Fie – Family House in Fanti_

The Ebusua Fie design was developed from an investigation of the local customs, cultures and ways of building of the Fanti people, specific to the town of Elmina in the central region of Ghana. Elmina is located on the southern coast of Ghana and has seen significant contact from Europeans since 1471 when the Portuguese first landed on its shores. Since then, the town and its architecture have been influenced by Dutch and British sensibilities.

The traditional architecture of the Fanti people of Elmina is similar to other coastal towns on the South of Ghana. These structures were built using the timber and clay (wattle and daub) method, which are still characteristics of coastal Ghana.

Traditionally these structures were rectilinear in form with numerous openings to take advantage of the cool breezes and the smaller variances between day and nighttime temperatures. They also often had a sheltered veranda and open courtyards similar to the Akan courtyards which were used for various purposes including the preparation of fish, repairing of items such as fishing nets, and greeting and receiving guests.

The Europeans brought with them new building techniques, tools and cultural traditions. However, archaeological and documentary research has shown that even though the Europeans had significant, “Elminans [that] remained ‘African’ in terms of their core beliefs or worldviews,” many buildings exhibited European ideals in their exterior manifestation. However, the use of space within structures that have been excavated exhibited more continuity with African traditions.

During the Portuguese and Dutch occupation “buildings were generally made of roughly cut blocks of unmortized Elminian sandstone” as opposed to the traditional wattle and daub structures of the pre-European era. The use of stone saw the development of two story buildings which are still seen in Elmina today.

While these innovations allowed for new ways of building and thinking about the dwelling, the Fanti people largely carried on cultural traditions such as burial rites, festivals and ritualistic offerings and most importantly their traditional relationships to dwelling spaces. While the exterior of these buildings were changing in form and material (multi-storied and stone construction), the use of spaces were continuing along traditional values and interactions.

For example, a structure excavated in Elmina showed:

The linear arrangement of rooms around a central courtyard is comparable to traditional house construction throughout the Akan and Guan area. Many modern houses in Elmina retain a similar functional arrangement. The courtyard is of particular importance, serving as a semi-private area for cooking, eating and a variety of other activities. It may even be used as a sleeping area on hot nights. In function it seems to have changed little between the early seventeenth century and the present.

A study of the Fanti people of Elmina and their architectural development is therefore fitting for this project, which seeks to negotiate between modernity and traditional values because investigating traditional architecture can’t be undertaken in a vacuum without understanding all of the historical influences which have been assimilated into the traditional language. These influences are now as much a characteristic of the region and people than the purely indigenous forms and materials.

This proposal re-examines the relationship between traditional and modern in the presentation of Ebusua Fie, a modern take on the traditional Elmina family house.

DESIGN NARRATIVE
The Ebusua Fie prototype is a 2 bedroom dwelling with a compact footprint. A visual study of the current city of Elmina and speaking with residents revealed that it is a congested town. Municipal data shows that Elmina’s core town has approximately 600 houses per square kilometer with between 6.1 and 13.3 persons per house. Traditionally, many people live in family houses or compounds. Some who may want to live outside of the family home still do so due to rising costs of land and building construction costs in Ghana. Due to the fishing industry, many people choose to live in these family homes closer to the sea than to venture further away. This phenomenon can be seen, not only in Elmina, but also in Accra and other Ghanaian cities.

Interviews with Fanti Elminians showed that they value proximity to the extended family but would appreciate more privacy within their spaces in the home. Most people converted certain areas with makeshift partitions, as they weren’t allowed to make major alterations to the structure. This concept of privacy while maintaining close connection within a small footprint formed the major conceptual strategy for the project. How can space be layered to provide privacy while maintaining flexibility and ability to engage publicly? How can the courtyard provide the means to accommodate this?

The smaller footprint enables this prototype to be built in congested areas. The programmed spaces are spread across two stories similar to the two story buildings dotting Elmina town. Spatially, as in traditional Fanti use of space, the courtyard is the most important aspect of the prototype. This courtyard breaks its traditional rectilinear form and extends to the perimeter of the building forming slots, which provide natural ventilation within the building and light to interior spaces. These slots also reflect the traditional relationship between the compound house and the community. They reach out to the exterior/community while remaining screened and private. The courtyard also has a wind tower effect pulling air through the building and up through the opening at the roof.

The courtyard extensions become programmable spaces for the daily routines in the house such as exterior kitchen, patios, play areas, family gathering areas or potentially sleeping areas. These can be concealed or revealed with sliding partitions creating a level of privacy within these courtyard nooks. The nooks can be opened up and become part of the main central courtyard and covered walkway thereby transitioning from more private intimate gatherings into larger family gatherings.

This exterior covered walkway surrounding the main courtyard provides a means of separation/privacy from programmed areas. The interior spaces can open up and connect to the courtyard as needed by sliding doors. These nooks and their adjoining spaces with movable partitions allow for a multitude of ways of using the spaces with varying degrees of privacy (for example, additional sleeping areas for family members).

The courtyard and courtyard extensions are screened by vertical wooden screens of varying degrees of transparency. More private areas have more dense screening. These screens also allow for ventilation through the space as in the case of the courtyard extensions. All windows open to the exterior and courtyard to allow for cross ventilation. This reflects the traditional form of the coastal compound house, which permitted a free flow of air.

These wood screens alternate with solid walls, which form the main structure of the building. The solid walls are constructed of interlocking, stabilized and compressed earth blocks (stabilized by approximately 8 percent cement), which are self-supporting. New innovations in building with stabilized compressed earth blocks makes this a viable solution for a modern building project.

These compressed earth block walls include the tradition of mark making by being cast with a relief of an abstraction of the Adinkra symbol, Mframadan. Mframadan means wind-resistant house and is an ideal imprint to grace the walls of this home. The abstracted imprint lends an additional textural quality and three dimensionality to the compressed earth block.

The use of wood and earth and its implementation as solid vs. void and interior vs. exterior, creates a
layering of space similar to the layers of the wattle and daub. The prototype takes this concept and extends it spatially as if one were able to occupy the space between the wattle and daub.

The combination of these elements result in a building that is environmentally sustainable and reflects elements learned from traditional ways of building. In addition to the cross ventilation provided by the screens, courtyards and window openings, the stabilized compressed earth block has excellent thermal performance, keeping interior spaces cool and minimizing heat gains.

Traditional coastal houses also attempted to limit the transmission of heat through the roof structure through the use of thatch. The building uses a modern interpretation of this, utilizing a typical wood frame with Onduline (or similar), bituminous roof tile strips made from recycled materials. Insulation is sandwiched in the roof as needed.

**SUMMARY OF MATERIALS USED IN THE BUILDING**

**Structure**
- Foundation: concrete (pigmented or pigmented render with color to match compressed earth blocks)
- Walls (exterior): interlocking stabilized compressed earth blocks (8% cement to be confirmed when soil is chosen); Stabilized earth blocks are self-supporting; these earth blocks are cast with imprint of abstracted Adkinra symbol enhancing the textural quality of the blocks. All exterior earth blocks finished with clear sealer for additional protection against the elements
- Ring beam: the top of the self-supporting stabilized compressed earth block wall is framed by a concrete ring beam (pigmented or pigmented render with color to match compressed earth blocks); The floor frame of the first floor and roof sit on these ring beams
- Floor framing: typical wood floor framing
- Roof: sloped wood frame with Onduline bituminous roof tile strips made from recycled materials

**Finishing**
- Screen elements and flooring: locally sourced wood which is treated to protect against the elements
- Ground floor: terrazzo
- Windows: wood frame windows by local manufacturers
- Walls (interior): interlocking stabilized compressed earth blocks (8% cement to be confirmed when soil is chosen); left exposed as exterior blocks or finished with plaster or tile at wet areas

**COSTS**
Studies show that you can save up to 30% compared to traditional masonry construction when using compressed earth blocks. This is achieved by using readily available materials (soil) and reduced labor costs for wall construction. The building utilizes local materials and simple construction which also results in a cost effective building.

**FEATURES THAT WOULD APPEAL TO A PROSPECTIVE HOMEOWNER**
A prospective homeowner would choose to buy this home design as opposed to a building that does not reflect the special African design elements due to the following factors:
- It is more cost effective
- It is environmentally sustainable, reducing homeowner’s reliance on air-conditioning thereby reducing life cycle costs
References traditional values in terms of community and family relationships while maintaining privacy
- Small footprint, allowing building in more dense areas or on smaller plots of lands that may be more affordable
- Can be built by both skilled and un-skilled laborers reducing costs to homeowner
- Allows for shared space with extended family when necessary or required

FEATURES THAT WOULD BE WORTHY OF BUILDING CODE REQUIREMENT IN AFRICA
The elements worthy of becoming building code requirement for construction in Africa are:
- Sustainability features: there are several agencies worldwide (such as LEED) that monitor and oversee designation of sustainable buildings. However, while these are a ‘good to have,’ many of the requirements for a green building are not required in Ghana and on the continent by building code, which is more focused on health and safety.

Elements such as natural ventilation, a certain percentage use of local material and sustainable construction methods, outlined in this prototype, should become part of the building code.

CONCLUSION
Summary of Southern Sahara Elements of Design
- Cultural/Lifestyle Elements Used
- Deformed and extended courtyard as central aspect of the building
- Traditional values and relationships surrounding the courtyard
- Negotiation between community/privacy and family dynamics
- Modern kitchen with exterior kitchen extension in courtyard slot, allowing for more traditional ways of cooking in a modern atmosphere
- Tradition is evolving over time, as shown in the nod to two stories and modern building technologies

Aesthetic Qualities
- Abstracted Adkinra symbol imprint on compressed earth block adding textural quality
- Natural color of earth block and general color palette of space
- Layering of earth and wood in space similar to layering of wattle and daub in traditional construction

Sustainability
- Courtyard and its extensions; wind tower effect keeps spaces cool
- Natural cross ventilation throughout the space
- Use of local material such as compressed earth blocks and wood
- Simple construction capable of being carried out by artisans or skilled builders
- Small footprint allowing to be built in areas of density reducing need for additional infrastructure
- Natural lighting through openings in courtyard and on perimeter minimizes reliance on artificial lighting when not needed
- Landscaping at courtyard and exterior of building keep building cool