



**AIN**  
Africa Innovation Network

**2<sup>ND</sup> EDITION**

# **AFRICAN CITIES MAGAZINE**

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**RESILIENT AND SUSTAINABLE CITIES  
THROUGH INNOVATIVE SOLUTIONS**

**URBAN PLANNING INNOVATION**

**ARCHITECTURE AND INNOVATION**

**AFRICA'S ARCHITECTURE AND URBAN HERITAGE**

**CITIES PIXELS AND COLORS**

# THE CONTENT

01. SPECIAL FEATURE .....	06
Education in Architecture, Planning and Design in Africa: challenges and vision for more sustainable and resilient African cities .....	06
02. URBAN PLANNING INNOVATION .....	30
Challenges & opportunities for resilient, & sustainable cities in Africa .....	32
Innovative solutions for a better African Urban Future .....	50
Interview with Jerome CHENAL .....	66
03. ARCHITECTURE INNOVATION .....	68
People-centered Architecture .....	50
Innovative architecture projects .....	90
Interview with Hayatte Ndiaye, President of the National Order of Architects of Chad .....	100
04. AFRICAN ARCHITECTURE AND URBAN HERITAGE	
Influence of religion and beliefs in architecture .....	116
Cameroon museums: THE LANGUAGE OF SYMBOLS FOR A COSMO-ARCHITECTURE .....	134
05. CITIES PIXELS AND COLORS .....	146
The African city in theaters .....	148
WEART'CHITECT: For the urban to become again the image of our identity .....	152
The Heritage Wall Benin .....	156



**Leandry JIEUTSA**  
**Founder of Africa Innovation Network**

AIN MAG #2

Welcome to the second edition of the African Cities Magazine by Africa Innovation Network.

For two years now, we have been producing this magazine on the occasion of World Cities Day, which covers the main trends and dynamics underway on the continent in terms of resilient, inclusive and sustainable urban development. Our ambition through this initiative is to co-construct a shared vision of the African sustainable city.

Indeed, this is the raison d'être of Africa Innovation Network. We are a network of experts and specialists in urban issues constituting a think tank focused on sustainable city models in Africa. As such, we are developing a number of initiatives including the African Cities Round Tour, a documentary series that gives voice to the continent's actors to draw a vision of more sustainable, smart, resilient and inclusive African cities, notably through the potential of innovation and technological development. In addition, we also support cities and territories in creating more inclusive and sustainable living environments through sustainable planning tools, coaching, capacity building, urban development strategies, marketing tools, strategic plans, etc.

This second edition of our magazine takes up some of the major axes that underlie the development of African cities. A special feature is devoted to education in architecture and urban planning in Africa in the first part. Then we address major issues of the urban future of the continent including public spaces, urban resilience, smart city. etc. You will have the opportunity to discover special interviews with some of the major actors of architecture and urbanism on the continent, who will present their visions for the African cities of tomorrow. Inspiring projects in architecture and urbanism are also presented, especially those that promote better social inclusion, integration of local communities, and local economic development. Finally, this second edition of the magazine shows the place of religious cultures in architecture in Africa before highlighting inspiring urban art projects.

We hope you enjoy this second edition of our magazine and that it will give you a better perspective of African cities and inspire you to contribute more to the creation of more inclusive, resilient and sustainable cities in Africa.



# AFRICA INNOVATION NETWORK

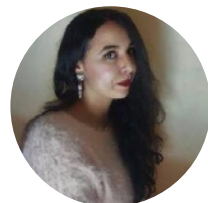


Africa Innovation Network brings together experts in diverse and varied fields to offer sustainable and innovative solutions for a better urban future in Africa. We are a think tank developing new approaches for more inclusive, resilient, and sustainable cities in Africa. We develop initiatives, projects, programs, and materials to support cities to move forward to more sustainable human settlements. Our approach is human-centered and based on frugal innovations. We are developing simple, participative ideas and solutions to make our cities and our rural areas a better place for all. Our work is based on creativity and innovation to propose solutions that help to build a better future in our cities for all. Initiatives of Africa Innovation Network are made to analyze, understand and develop solutions in order to promote sustainable development in our cities.

## OUR TEAM



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Urban planner  
**Founder & Executive Director**



**Hind REZOUK**  
Architect  
**Secretary Executive & Country representative North Africa**



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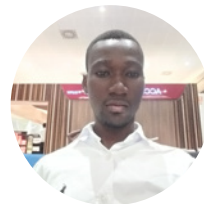
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Architect  
**Member**



**Rajae HAISSOUSS**  
Architecture student  
**Member**

# WHAT WE OFFER

## INNOVATIVE AND SUSTAINABLE URBAN PROJECTS

Through our network of experts and specialists in urban planning, architecture, engineering, transport and mobility, geographic information systems, design, etc. we accompany cities and territories in the creation of more inclusive and sustainable living environments through sustainable planning tools, coaching, capacity building, urban development strategies, marketing tools, strategic plans, etc.

## COUNTRY/REGION/CITIES MAGAZINES

The country magazine uses the same ideology and structure of African Cities Magazine but on the scale of a country, a specific city or any scale of territory. The aim is to work with local actors to draw up a picture of the dynamics of architecture, urban planning, design, art, architectural and urban heritage.

## DOCUMENTARY SERIES

We produce documentary series on the scale of countries, cities and territories that give voice to the continent's actors to draw a vision of more sustainable, resilient and inclusive African cities, particularly through the potential of innovation and technological development. Urban planners, architects, designers, artists, engineers and simple city dwellers, our documentary series aims to take stock of the urban dynamics of the target territory, while taking a forward-looking look at the future. Our documentaries analyze the urban dynamics of the target territories and draw the fundamentals to build more resilient and sustainable urban settlements.

# MEMBERSHIP



### ASSOCIATE MEMBERSHIP

Individuals working in a field related to AIN's activities, wishing to be part of the network and contribute to the various initiatives.



### HONORARY MEMBERSHIP

Senior professionals wishing to be part of the AIN network and support and/or technically to the various activities.



### AFFILIATE INSTITUTION MEMBERSHIP

Institutions wishing to be part of the AIN network and contribute financially and/or technically to one or many activities and initiatives.



### HONORARY INSTITUTION MEMBERSHIP

Sponsoring institutions supporting all the activities and initiatives developed by AIN.



# 01 SPECIAL FEATURE

## EDUCATION IN ARCHITECTURE, PLANNING AND DESIGN IN AFRICA: CHALLENGES AND VISION FOR MORE SUSTAINABLE AND RESILIENT AFRICAN CITIES

A series of interviews with academics, researchers and heads of urban studies teaching institutions to understand the challenges and draw a common vision of how to teach architecture and urban planning to build more sustainable cities in Africa.







## MARK OLWENY

*Architect, Educator, Senior Lecturer in Architecture, School of Architecture and the Built Environment, University of Lincoln, Research Associate Professor, Faculty of the Built Environment, Uganda Martyrs University. Experienced Senior Architect with a demonstrated history of working in developing countries. Skilled in Environmental Design, Sustainable Architecture, Urban Design and Architectural Education. Strong administrator, Doctorate in Philosophy (PhD) focused in Architecture from Cardiff University / Prifysgol Caerdydd.*

“ I believe a new direction for architecture and planning education should begin with a more holistic approach... ”

Unfortunately, architectural and planning curricula on the continent are still largely based on the western approach. Thus, much of what is taught and what is considered important in the curricula comes from outside rather than within the continent. Moreover, if you look at some of the old schools that came into being around independence in Kenya, Ghana, Nigeria, and more recently in Zimbabwe, etc., their objectives have been to train people to produce buildings that celebrate the aspirations of these independent states. The result is seen in the architecture and layout of our cities where what is perceived to be a ‘good city’ is one that is planned in a grid pattern, with streets primarily for cars, which has absolutely nothing to do with how people actually use space in the African context.

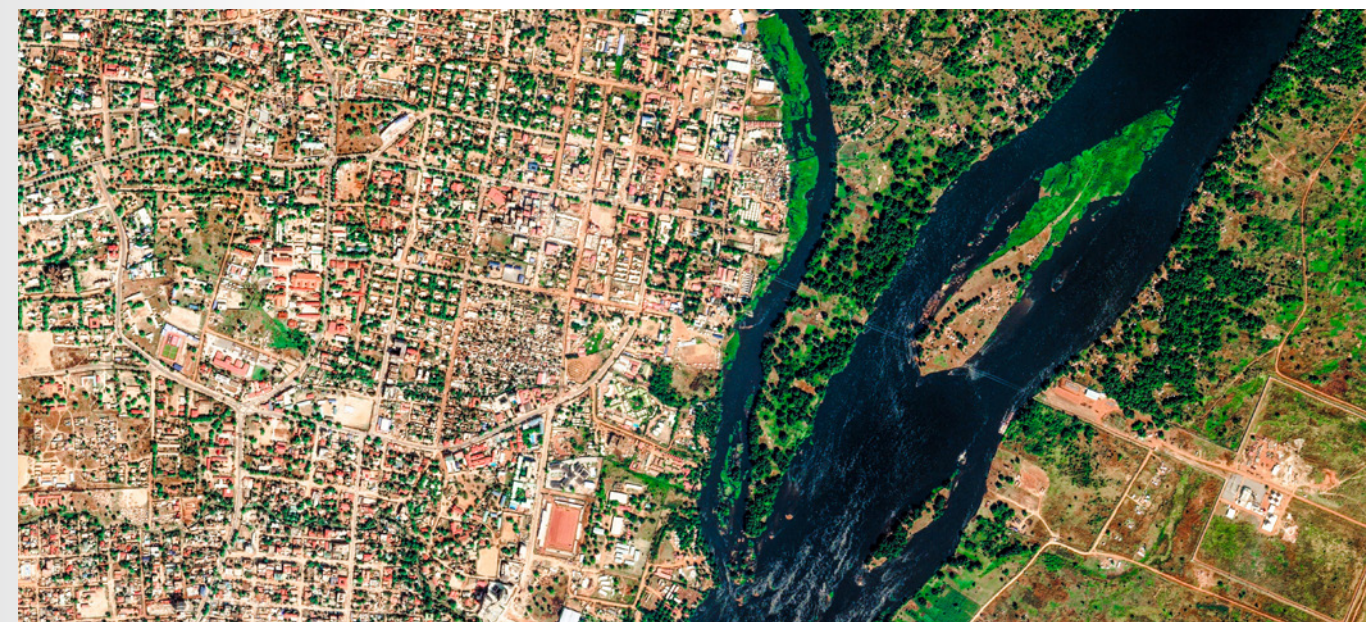
Consider the fact that most people don’t drive. For them, to get from A to B the distance should be as short as possible. I don’t need space for four or at times six cars, I need comfortable space for people to walk. So if we start thinking about people first, the way our spaces are designed and laid out will be very different. But a lot of the current approaches to architecture and planning are car oriented despite only 5% of people using cities actually drives.

So once we adopt this idea of planning from a physical entity, we automatically exclude people. But when you

look at it from a people’s perspective, one of the things you don’t do in planning is produce a map.

In South Sudan, there have been a series of proposals for Juba that are in the shape of animals. Although these may seem appropriate on a plan, this ignores the reality that these are not visible or apparent for the users as people experience urban spaces when they are within them, and not from the sky.

Some schools, and mainly the newer ones, manage to break away from this paradigm. But most of them still remain in this way of thinking where man is put aside in architectural and urban designs. This is also the case in private schools that do not find it lucrative to detach themselves from the classical teaching methods. Personally, I believe a new direction for architecture and planning education should begin with a more holistic approach, one that compels students to appreciate specific social, cultural and environmental issues. Here education could take a leaf from landscape architecture education. Landscape architecture education and the profession engage with social and cultural issues in ways that architecture and planning do not. Landscape architecture asks questions, like, what is the meaning of a place? Why do people do it this way? How can we make it work? Rather than saying, well, this looks horrible, let’s just tear it down or start from scratch.



Juba city Southern Sudan, Photo source: Google earth

“ We need to adapt the teaching to the local context. It may not produce the high architecture that we see in the world, but it will meet the local needs... ”

I will focus on the case of Anglophone Africa, on architectural education specifically and address three aspects: how were the schools of architecture created, who teaches in them and what were their objectives? There are parallels with planning, which I will include when I can.

As far as their creation is concerned, by far the majority of architecture schools came into existence just after independence (outside South Africa, these are Ahmadu Bello University, University of Nairobi and University of Khartoum). While the initial goal was to provide skilled labour to replace expatriate staff, the desire by the newly independent states to showcase their aspirations, and demonstrate their position internationally, it was not long before educational endeavours were steered toward fulfilling these objectives, geared toward national prestige through iconic - an ideological imperative.

Now, for the teachers in these schools. Initially, it was necessary to rely on foreign staff, for a number of reasons, but primarily the schools were following an international curriculum that needed staff that could deliver it satisfactorily. These instructors largely came from Western Europe (generally former colonisers countries), as well as the Soviet Union, the United States and to a lesser extent India). . While this has served to allow the development of divergent currents of thought, there has been little in-depth interrogation of the appropriateness of these curricula and pedagogical

approaches. The most obvious example I can cite here are many history and theory courses, which still rely heavily on a chronological approach heavily biased toward European architectural and planning endeavours. You have to ask yourself, is the knowledge content, and approaches to architecture and urbanism we teach fit-for-purpose? and in many cases the answer is no. There is a need for us to scrutinise what we teach and how we teach it. What exactly are we doing? What is the purpose of architecture and planning education now? Do we want to produce replicas of cities and buildings in Europe and North America? Or do we want to help improve the conditions of people? The situation on the ground and the needs are completely different.

We need to adapt the teaching to the local context. It may not produce the ‘high’ architecture, but it will meet the local needs.

Uganda for example is a very hilly country. But many plans (both planning and architectural) ignore this fact. Why does this happen? In some aspects the training is not context specific; it seems to reinforce the notion that the site (and people) should adapt to suit the designs, and not the other way around. So we need to do better than that and think, how do we compel the next generation of urban planners and architects to be cognisant of and respond to the local situation, understanding that and work with it as a basis for developing appropriate spaces that work for people.



When you look at, for example, the most common building typology in Uganda today, it is the same as that designed during colonial times for single men. These «boys' quarters» because at that time in many parts of Africa, there was a need for workers, usually young men who came to town to work, and were granted temporary residency.

To prevent them bringing their families, they were provided with minimal accommodation with small rooms that barely accommodated one person, with shared toilet facilities, and no kitchens...

Now more than 60 years after independence, we still build the same way. So if after all these years and all the architects and urban planners trained, why is it that there has not been any change? I believe this is because as architects and planners we have failed to impact on the general population, and continue to train subsequent generations to ignore the needs of the majority.

“ **Students are unfortunately taught, to prepare to make the next tallest building, rather than getting them to understand the sense of the place...** ”

The way architecture and urban planning training is delivered on the continent has indeed an impact on African cities. On the positive side it can create functional spaces where people have decent environments to live, work and recreate. But on the negative side, I think things are often done out of context. Take housing for example, this is often developed and planned in isolation of socio-economic realities, an approach that reduces the question of 'low-income' housing to the provision of the proverbial four walls and a roof. Consequently, we often see such housing developed far away from the centre of cities. These are a distance away from economic and employment opportunities - the reason people migrated to the cities' areas in the first place.

Oddly enough, this was a problem that was seen in the US, UK and Australia during the 1960s, so why are we building the same mistakes in 2020? We have to rethink our approach, taking note that some of what is still taught is obsolete, and in many cases was not actually based on the realities experienced within the context within which it is taught. Back to the housing question, the lack of housing and the burgeoning slums, squatter and informal settlements close to the city centres are a result of a larger question. It comes to human dignity and the value of humanity. By paying a salary that is barely enough to live on, workers are compelled to seek



Uganda-Development Photo source: Wikimedia commons

the most convenient accommodation as close to their place of work as is practically possible. No one wants to spend all their salary and time commuting. So as we can see, architecture and planning is not just about physical infrastructure, it is much wider. These are the links that are often not presented as part of the educational process, which often exists in silos.

Many countries in Africa are characterized by their macrocephaly. In Uganda, for example, as soon as you leave Kampala, there is literally nothing going on in the small towns. Some time ago there was not even a supermarket outside Kampala. Everything happened in the capital. Now, with decentralization, things could be better, but it is important to provide the secondary towns and the countryside with adequate facilities and infrastructure to limit the pressure on the big urban centers and to strengthen the links between the cities and the countryside. Currently, getting a national identity card, or a driving licence requires a trip to the capital Kampala. This is not at all practical, neither is it contributing to the idea of decentralisation.

Now, in terms of education, I prefer to use education, rather than training as I believe education is a core element of higher university education. While there are elements of training within architecture and planning

education, it is important that students acknowledge that their role goes beyond merely fulfilling narrowly defined objectives of individual projects, to include an appreciation of the consequences of these actions. If you look at Zanzibar, the old city - Stone Town, is among the most visited places in Tanzania. This is not because it has new glass and steel clad buildings or wide multilane roads. It is because it is at a human scale in a number of ways. It is a pedestrian environment with narrow streets, but with spaces where people can sit and talk. The soul of the community keeps it alive. The street itself is a channel of information. And that information can travel long distances because every time you walk down the street, greet people, stop, talk to them they will tell you a story. So it's strange that we assumed that cities should be so new and glitzy. And that's what students are unfortunately taught, to prepare to make the next tallest building, rather than getting them to understand that the way people use spaces and how they engage with the environment, is what makes the difference.



Zanzibar, the old city - Stone Town, Photo by Javi Lorbada on Unsplash



## “ Adapted curricula to build more inclusive, resilient and sustainable cities in Africa... ”

The starting point would be thinking about the people, their climatic, cultural, social context, etc. If you start from the climate for example, the solution in Botswana can certainly not be the same solution that you have in Uganda or, in South Sudan, because these are very different situations and climates.

We teach students about what is happening in the rest of the world, but very little about what is happening in the local areas. There is limited literature on the architecture of African context, so we need to write and tell the stories of and from Africa, while criticizing the things that don't work. We are often reluctant to criticize things, just because somebody put a lot of money into it, whether it works or not.

Unless we start having deep, meaningful, frank discussions about our context, we're going to continually go down a path that doesn't help us to build sustainably and resiliently.

When you look at many urban centers across much of sub-Saharan Africa, we find an informal sector that is actually larger than the formal sector. The people who work in this grey economy are rarely if ever included in design discourse, effectively marginalised from what is perceived to be a desired future. Without an appreciation of their needs, this marginalization is set to continue with these issues brought into the mainstream of teaching and practice.

In the university I work with in Uganda, the Uganda Martyrs University, we are taking students out of the classroom, to talk to the communities. For example right now, a student is working to understand how people live and how they engage in their daily activities. This bottom up approach is critical in ensuring any proposals are embedded within the community, and not cosmetic. One of the things I think is also important is to take some of the architecture schools out of the major urban areas, figuratively and practically, to get a feel for the communities and their needs.

When you look at the Kwame Nkrumah University of Science and Technology in Ghana, the Copperbelt University in Zambia, and the University of Science and Technology in Zimbabwe, these are all located in secondary cities, and where the first architecture schools in these three countries were situated. This deliberate move ensures that the link between education and the lived experiences of a large proportion of the population could be better addressed. This was also the rationale for the location of the architecture school at the Uganda Martyrs University at the university's main campus at Nkozi.. This certainly has a big impact on the shape of the education and the students that go there.

So, it's about basic things like understanding what our needs are, beyond just shelter from the elements? How do we make our urban centers work better for people? How do we make them work better in the context? Should we continue building wider roads, yet the real need is for more and efficient public transport networks?



Uganda Martyrs University

## “ Make friends, talk to people who come from different backgrounds, who have different life experiences, and travel as much as possible... ”

I think the very first piece of advice I would give is to be open to learning. Be open to new ideas and to constantly question preconceived ideas you may have. Beyond that, you have to understand that whatever education you get, whether it's architecture, landscape architecture, or urban planning, it's only education to help you start your career, it's not the end of your education, which should continue throughout your life. This is what differentiates training from education.

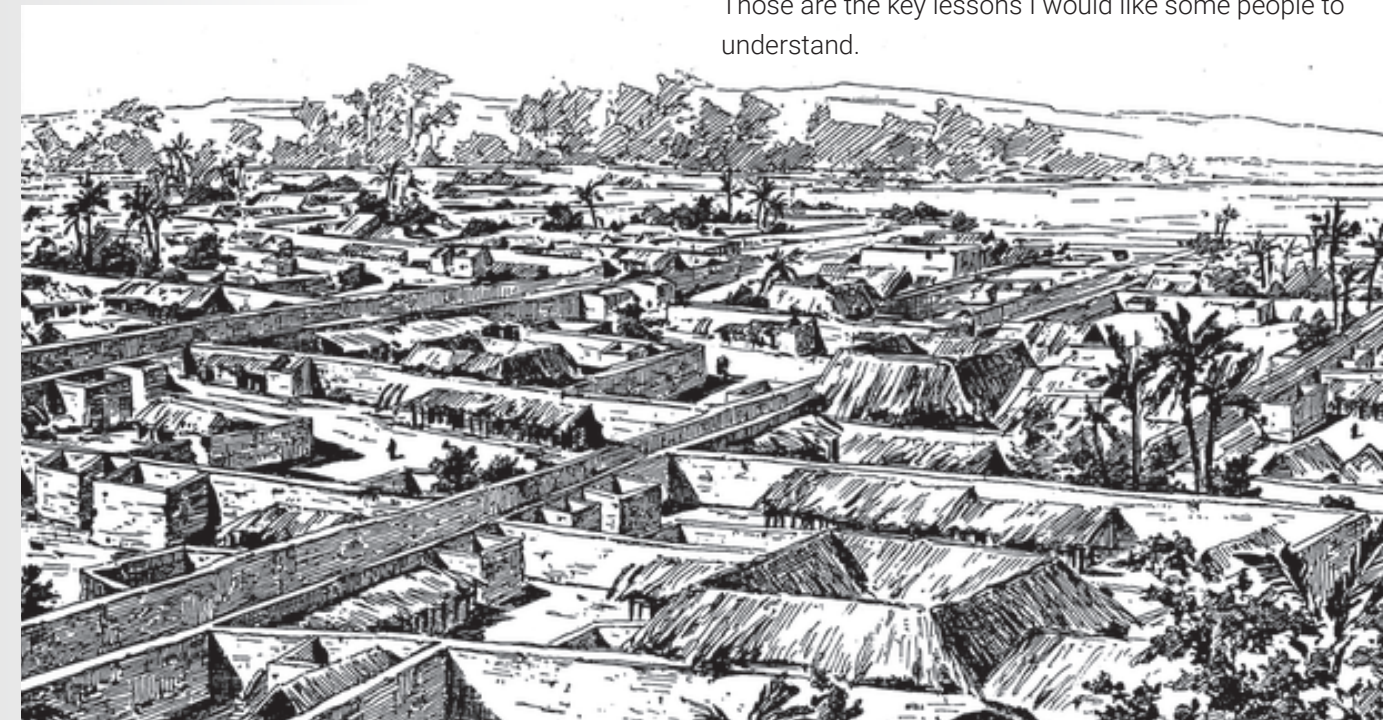
I also believe that students should try as much as possible to draw on their own experiences, and understand that their experience is just an individual experience, in the midst of millions of other people's experiences. To be able to design for other people, it is important to understand and appreciate why we do things a particular way, and that this is not how millions of other people do it (for a host of different reasons). Often, I think we approach things from the perspective that our experience is the only valid one, and presume other people's experiences and views are equal to ours.

This is a consequence of the socialization process of education. For many students their experiences are narrowly defined, limiting their exposure to the diversity of experiences of others. A poignant expression of this can be found in Musa Okwonga's memoir, 'One of Them'.

The outcomes of educational systems that derive students from a narrow group of students cannot truly address the issues of broader society. Indeed even today, some schools of architecture have intakes comprising students from a handful of secondary schools, it would be impossible for this group of students to appreciate the value of different opinions as they have never really been exposed to difference.

And so my advice in this context is to make friends outside of that very narrow circle. Talk to people who come from different backgrounds, who have different life experiences, if possible, travel as much as possible whether it's inside or outside your region or country. Many students and even professionals do not know the richness of their own country in terms of architectural and urban heritage. Knowing one's history, heritage and environment can contribute to a better understanding of place, and space. We had great cities in Africa 300 or 400 years ago. You have Benin City in Nigeria, you have Congo City in what is now the Democratic Republic of Congo. We have Great Zimbabwe, and Bigo in Uganda ... so there are great cities that exist that we don't hear about. Taking an interest in and learning about these early endeavours would greatly contribute to design explorations, not only in terms of form and materials, but also in terms of our ideation.

Those are the key lessons I would like some people to understand.



A drawing by a British officer representing the city of Benin before its destruction by the British army in 1897, Photo source: Wikimedia commons





## PHILIPPA NYAKATO TUMUBWEINEE

*Architects; Senior lecturer and Head of School at Architecture Planning and Geomatics, University of Cape Town. She was awarded her PhD at the School of Higher Education Studies, University of the Free State. Tumubweinee's commitment to architectural education has developed through her involvement as an external examiner for MProf and BHons students in Architecture at the University of Pretoria and Namibia University of Science and Technology.*



South Africa

### “ School of Architecture, Planning and Geomatics ”

The current School of Architecture, Planning and Geomatics (APG) at University of Cape Town (UCT) is the result of two mergers. The first merger took place in 1985 between the then School of Architecture and the Department of City and Regional Planning, and the second merger took place in 2002 between the School of Architecture and Planning and the Department of Geomatics. The School's primary purpose is to produce professionals who can deal competently and creatively with the development and conservation of the built and natural environment by imagining alternative, more just and inclusive urban futures. The School of Architecture, Planning and Geomatics (APG) has a current enrolment of 667 students, 227 are registered for postgraduate degrees; of these 22 students are registered for PhDs. APG offers programmes which lead to the following qualifications: Bachelor of Architectural Studies (BAS); Bachelor of Science in Geomatics; Bachelor of Architectural Studies (Honours); Bachelor of Science (Honours) in Geographical Information Systems; Bachelor of City Planning (Honours); Bachelor of Landscape Architecture (Honours); Master of Architecture (Professional); Master of City and Regional Planning; Master of Landscape Architecture; Master of Urban Design; Master of Philosophy (MPhil) in Conservation of the Built Environment; Master of Philosophy (MPhil) in Southern

Urbanism; and Opportunities to study for research-based MPhils and Doctor of Philosophy degrees. APG is located within the Faculty of Engineering and the Built Environment (EBE). Professor Alison Lewis (from the Department of Chemical Engineering) was elected as the Dean of the Faculty in 2015, and she remains in the position. All Departments and Schools within EBE offer degrees accredited by professional councils/institutes. Processes of accreditation are recognised and supported in the Faculty and the University. EBE comprises five Departments (Construction Economics and Management; Civil Engineering; Chemical Engineering; Mechanical Engineering; and Electrical Engineering) and one School (the School of Architecture, Planning and Geomatics). In accordance with 2021 data, EBE has an enrolment of 4,452 students, of whom 1,116 are registered for postgraduate qualifications and 262 are PhD students. EBE comprises 429 academic staff and 173 professional, administrative and support staff. The Faculty has 20 active research groups, 7 SARChI chairs, 58 NRF rated staff and R220 million in research income.

The undergraduate Bachelor of Architectural Studies (BAS) Programme within the School of Architecture, Planning and Geomatics (APG) provides a foundational design-oriented education from which streaming can occur into a range of postgraduate degree programmes, including the Bachelor of Architectural Studies (Honours), the Bachelor of City Planning (Honours) (linked to the Masters of City and Regional Planning) and the Bachelor of Landscape Architecture (Honours) (linked to the Masters of Landscape Architecture). These Honours level qualifications allow students to apply for the one-year Master of Urban Design (MUD) degree, a one-year MPhil specialising in the Conservation of the Built Environment and a research-based MPhil. APG also offers opportunities to register for a PhD. Furthermore, the African Centre for Cities (ACC) facilitates a course-work and dissertation MPhil on Southern Urbanism and some of these students take electives in the Planning Honours Programme. A planning stream was introduced into the undergraduate Geomatics Programme cluster in 2004.

Several degree programmes in the School are recognised by professional Councils. The Masters of Architecture (Prof) degree is recognised by the South African Council for the Architectural Profession (SACAP). In addition to SACPLAN accreditation, the Planning Programme is accredited by the Royal Town Planning Institute (RTPI) (<http://www.rtpi.org.uk/>). The combined Bachelor of Landscape Architecture (Honours) and Masters of Landscape Architecture Programme is accredited by the South African Council for the Landscape Architectural Profession (SACLAP). The MPhils are non-professional and non-accredited research degrees.



APG CoDesign Workshop, Photo by Candice Lowin, copyright of The Faculty of Engineering & the Built Environment, UCT.



EBE Architecture in Winter Expanded Photo by Candice Lowin



“ **The way we educate our urban professionals on the wider continent and in South Africa is being challenged...** ”

This is not because what we teach is not good, it is because it has become increasingly difficult, within a set and structured curriculum, to address the constantly shifting dynamic nature of the urban environments we live in. Within this changing context we, as urban professionals, find ourselves confronted with how to advance appropriate theories and practices to develop a holistic understanding of the urban environment across multiple and growing disciplines and interests. This difficulty is evident in the schism between what is needed and what is done. It translates as a break between how we as academic institutions develop and train the next generation of urban professionals and the realities of the multiplicity of fundamental tools and tactics that are required to develop and implement policies and governance systems that effectively deliver for people.

In part the schism stems from theories and practices that are borrowed from other times, other places and other cultures. As institutions we repackage and retrofit these theories and practices without always addressing the underlying complexities of our urban complexities and place-based realities. This calls for a “rogue” approach in the way that we train urban professionals who can contribute meaningfully in African urban environments and respond to, address and embrace a continually shifting context. This approach to training urban professionals could develop a form of urbanism that consolidates political, social, cultural and economic capital with the natural & built environment in order to bring together a conceptualisation of place and people as part of a complex world.



Architecture MSc Exhibition, Photo by Candice Lowin, copyright of The Faculty of Engineering & the Built Environment, UCT.

“ **Rather than provide a clear ‘vision of African cities of tomorrow’, it is vital that academic institutions together with other urban professionals and civil society collectively experiment and speculate as to what an African city should look like...** ”



Macassar Build 2019 Opening, Photo by Candice Lowin, copyright of The Faculty of Engineering & the Built Environment, UCT.

The African urban terrain is complex, and because it is complex questions of sustainability, resilience, and technological development in any African city can only be speculative. This provides fertile ground from which urban professionals, and the institutions in which they are trained, can explore and experiment with alternate realities and solutions to address a variety of underlying concerns. These include climate change and resilience, significant socio-spatial inequality and poverty (tied often to colonial spatial planning), and a significant demographic youth bulge in African cities. Rather than provide a clear ‘vision’, it is vital that academic institutions together with other urban professionals and civil society collectively experiment and speculate as to what an African city should look like. For if we cannot creatively conceive of it within the specificities and peculiarities of our context, we cannot build it. In APG we aim to develop urban professionals across all programmes who can radically reshape the urban environment at all levels.

This extends to, but is not limited to: 1) how we can creatively plan, design and develop our cities, towns and their neighbourhoods; 2) how we can creatively integrate combined thinking across the broadest range of disciplines involved in the urban environment – physical, socio-cultural, economic, public health, food, governance etc; 3) how can we creatively lead and manage policies and planning in the system at all levels of civil society and government.

“ **My advice for young architecture / urban planning students** ”

“Live out of your imagination, not your history.” - Stephen R. Covey



PIXEL Exhibition 2019 Photo by Candice Lowin, UCT.

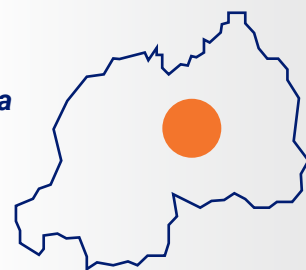




## MANLIO MICHIELETTA

Dean of the School of Architecture and Built Environment (SABE) at the College of Science and Technology (CST) University of Rwanda (UR). Manlio Michieletto is an Italian Architect graduated in 2007 from the IUAV University of Venice, and earned a PhD in Architectural Composition in 2010 from the IUAV School of Doctorate. After different academic and professional experiences in Europe (Italy and Germany) and Africa (Burkina Faso and D. R. Congo), he has since 2016 become the dean of SABE.

Rwanda



### “ School of Architecture and Built Environment (SABE)... ”

The School of Architecture and Built Environment (SABE) started in 2009 as a faculty of architecture in the former Kigali Institute of Technology. In 2014, the government decided to unify all scattered institutes in one unique public university that is called University of Rwanda, and the Faculty of architecture became the School of Architecture and Built Environment. SABE is one of the five schools comprising the College of Science and Technology that is one of the nine colleges of the University of Rwanda. SABE is in a very inspiring compound designed by the French architect Patrick Schweitzer and our students have the opportunity to be trained in this amazing architectural artifact. The building's aim is to be intended as an open book for students through the utilisation of different materials, construction techniques, details etc. Furthermore, it's a passive building with no use of mechanical installation. SABE has around 1000 students and four departments (Department of Architecture, Department of construction management, Department of estate management and valuation, and the Department of geography and urban planning). These are for undergraduate programs, but we also have a post graduate program in MSc IN GEO-INFORMATION SCIENCE FOR ENVIRONMENT AND SUSTAINABLE DEVELOPMENT and we are working with partners from Europe to set up a master in architecture that will start in 2023. These programs are supervised by around 40 staff members, including junior staff, senior staff, Professor, associate professor, senior lecturer, lecturer, assistant lecturer and tutorial assistant.

“ We have to significantly improve the offer in terms of education to give to young people the chance to study and be actors of changes in their communities and countries... ”

I do think the way education in architecture and planning is made have an impact on african cities now and in the future. However, to have a positive impact, it is fundamental to establish more schools or faculties of architecture and urban studies in Africa. We can not have or continue to have countries with just one Institute or School of Architecture, urban planning, etc. To meet African cities' challenges and turn them into opportunities, we must increase the education offered in Architecture, urban planning, and other urban studies not just in quantity, but also in quality. So, when we talk about the impact, we have first to significantly improve the offer in terms of education to give to young people the chance to study and be actors of changes in their communities and countries. African cities are a bit wider

as a concept, so we cannot compare Ouagadougou with Lagos or Lome with Kinshasa, etc. I think for training in architecture in Africa, the undergraduate students have to be trained as any other students over the world, then, specialize themselves through for example, postgraduate programs on the local context. At SABE, we try to introduce in the existing curricula the analysis and the study of the local context, to train students able -after an undergraduate degree, to appropriately manage a project in the local context. African cities are very different in shape, in size, etc. So, African students have to learn critical methods that enable them to have a holistic overview of the context. They have to be able to build a critical point of view, train their eyes to understand the context, identify problems and find the appropriate solutions.



School of Architecture and Built Environment, Photo source SABE

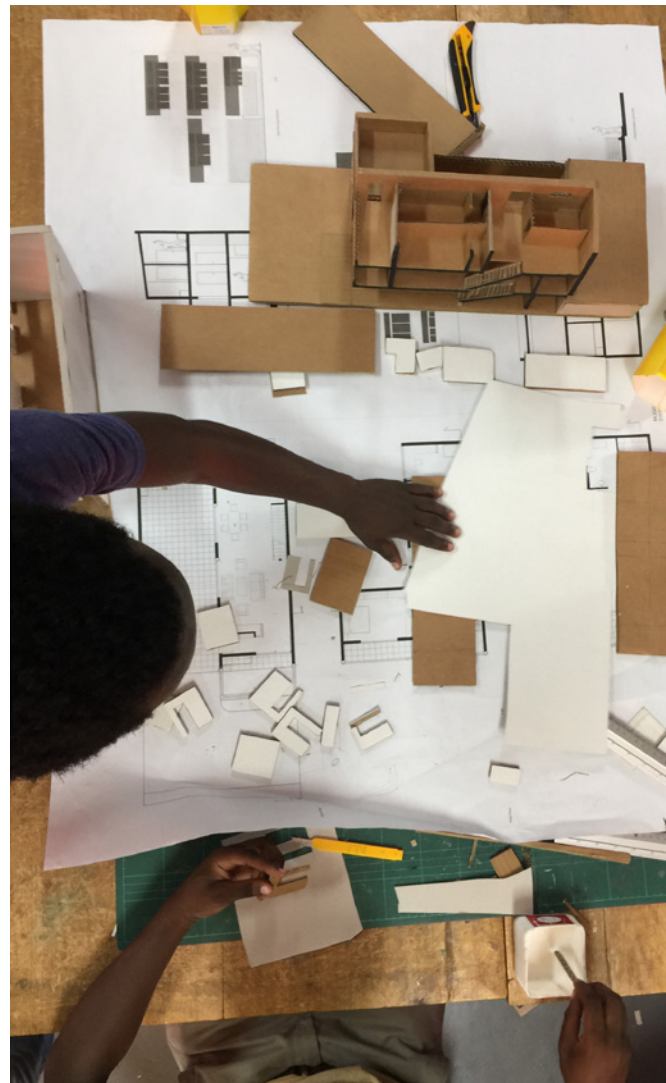


“ At SABE there is a constant relationship between teaching activities and local context...”

Lectures are normally based on tropical architecture and urban design, that means the architecture adapted to the local environment and context. We also teach students history of architecture and theory of architecture including the relationship between the city, and the built environment. So students move from universal theories of architecture and urban planning to theories of African cities, from tropical villages to African architecture. We also use resources to equip our students with theoretical and practical knowledge like books on African cities, UN-Habitat rules and principles, and the Green Council buildings rules that the Rwandan government established for the construction of green buildings in Rwanda. So, for us at SABE there is a constant relationship between teaching activities and local context. For example, in the Department of Geography, urban planning, students always have practical workshops on the local context, with the local

community involved, population, local stakeholders etc. We also have summer workshops that are targeting real issues or challenges in Kigali to not only have students adapted to the local context, but also to the local market. Furthermore, during their training, our students have to do professional internships for the fourth and fifth year.

All these help them to be adapted to market needs. We have been asked by our university to move to a problem based learning teaching system, which means that all our modules, especially for assessment and final examination, have to be based on problem based learning or a challenge driven education. So we have the theoretical part of the module, and then a practical one based on a real problem that students may identify in their context. The students work in groups to propose a solution to a real problem, starting from problem identification to an adapted solution.



WAVE 2019 Photo source SABE



Site visit School of Architecture and Built Environment, Photo source SABE

“ I see the future of African cities in the past...”

First of all, we have to be conscious of our past. The African city is rich in history and heritage that have shaped its evolution over time. This ancestral African city has always been smart and sustainable. It is therefore important to go back to this history and heritage to build the African city and not to import models from elsewhere. The second important thing in this context of rapid growth and urbanization is to train local actors who understand the context. It is a question of training city actors (architects, urban planners, designers, etc.) at the local level with local knowledge and know-how because they know their history, they have grown up in these cities and are the best able to understand the problems and to provide solutions. Another fundamental aspect to take into account for the African sustainable city is the political will. We can see that the great cities throughout the world were mostly built by political vision. Therefore, in Africa, it is important that the leaders draw a shared vision of the sustainable city and take the necessary means to achieve the objectives of the sustainable city.

“ Be committed and passionate about what they are doing...”

My advice for young students is to really be committed and passionate about what they are doing, because it is the only way to achieve good results, in all aspects of their life.



WAVE 2019 School of Architecture and Built Environment, Photo source SABE





## MOUSSA DEMBELE

*Malian Architect graduated in architecture from Xinghua University in China. He worked as an architect for 4 years in Singapore, then obtained his doctorate from the Kyoto Institute of Technology in Japan. After teaching for several years in Japan and China, he opened an architectural office in Mali before being appointed in 2015 as the General Manager of EAMAU.*



Togo

### “ Tell us about the African School of Architecture and Urbanism...” ”

The African School of Architecture and Urban Planning (EAMAU) is an inter-state institution that brings together 8 countries of the UEMOA (Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal, Togo) and the 6 countries of the CEMAC (Cameroon, Central African Republic, Congo, Gabon, Equatorial Guinea, Chad). It was created under the will of the heads of state in order to train young people to face the urbanization of African cities in 1975. In view of the challenges facing African cities in terms of urbanization, it can be said that this vision of member states through EAMAU is more than salutary in order to meet the challenges posed by the rapid urban growth of the continent by training local actors on urban issues. To this end, EAMAU trains architects, urban planners, and urban managers through Bachelor's, Master's, and Doctoral training cycles. The training courses are both theoretical and practical and lead the learners to the professional-grade after 5 years of study. The training method equips them with tools that enable them to practice the profession in an operational manner in different African countries, particularly with field training courses throughout the training program.



Traditional architecture exhibition Photo by G2L-PHOTOGRAPHY

### “ It is crucial to train professionals capable of facing the challenges of the continent in terms of urban development...” ”

With more than 1400 high-level graduates, who continue to shape the political, economic, and cultural landscape in African countries, EAMAU is an institution that is constantly adapting to best meet the challenges of the continent. Indeed, we have moved from the great canons of education in architecture and urban planning to the Bachelor's Degree Master's Doctorate (LMD) system in 2010. In addition, the diplomas of EAMAU have been accredited by the African and Malagasy Council for Education (CAMES), and our institution has been for the occasion retained as a reference school for the training of architects and urbanists. It is, therefore, necessary to adapt constantly to produce professionals capable of facing the challenges of the continent in terms of urban development. As we can see, the continent is experiencing rapid urban growth, and many factors are influencing this growth, so it must be directed and controlled so that cities are spaces of well-being, inclusion, social peace, economic prosperity, and offer a healthy and preserved living environment. This is why we put a particular emphasis on providing our learners with key and contextual tools through our training to achieve these objectives.

### “ Train professionals able to respond to global issues...” ”

EAMAU today has a scope that extends beyond the member countries by training actors from the whole continent and the rest of the world. This is how we keep an open mind on the world, by adapting and innovating, to train professionals able to respond to global issues related to digital development, climate issues, environmental protection, etc. However, we make it a point to ensure that our students have this understanding, the very expression and specificity of Africa in the training. It is in this context that our students do fieldwork each year to diagnose problems in African cities, and these problems are transcribed into concrete and local solutions through projects. Thus, the projects proposed by the students are the result of a concrete and pragmatic approach to research in order to respond specifically to the challenges of African cities. The teaching methods within our institution converge



African School of Architecture and Urbanism, Photo by G2L-PHOTOGRAPHY



towards excellence through the international character of the students, the transversality of the teachings, and the projects that are developed by the learners. This is so that the school is at the service of the States for the development of our countries. It is in this context that we develop training that can lead to projects that will allow States to modernize their development and economic take-off. We have introduced in this context a very important phase which is research. Today no institution, no field can develop without research and in our context this research component allows us to address in-depth the issue of African architectural and urban heritage. Africa is endowed with an immense heritage that can be considered open-air museums. The question is what can we draw from this heritage to build more sustainable and resilient cities? It is with a view to answering these questions that we are developing the research aspect in order to effectively produce reflections that contribute to setting up human settlements adapted to the African context. For the history of cities and civilizations millennia African abounds in examples in terms of sustainability, and resilience through the use of local materials, functional organization of spaces, waste management, environmental preservation, etc. The approach here is through research to draw from this rich heritage to develop modern solutions adapted to the social, cultural, economic, and geographical context of our cities.

“ **Students and young professionals across the continent have the mission of build more sustainable and resilient cities in Africa...** ”

We think that the objective for graduates should not only be to work in architecture or urban planning agencies, but to get involved in the high levels of administration, banking institutions, international organizations because they have the resources to do so. It is for them to be a force of proposal, not to evolve in a vacuum, to inform themselves, to travel to build more sustainable and resilient cities in Africa.



Traditional architecture workshop, African School of Architecture and Urbanism, Photo by G2L-PHOTOGRAPHY



Students during a worshop African School of Architecture and Urbanism, Photo by G2L-PHOTOGRAPHY



Cultural activities, African School of Architecture and Urbanism, Photo by G2L-PHOTOGRAPHY



# INTERVIEW WITH THE DIRECTOR OF EAMAU

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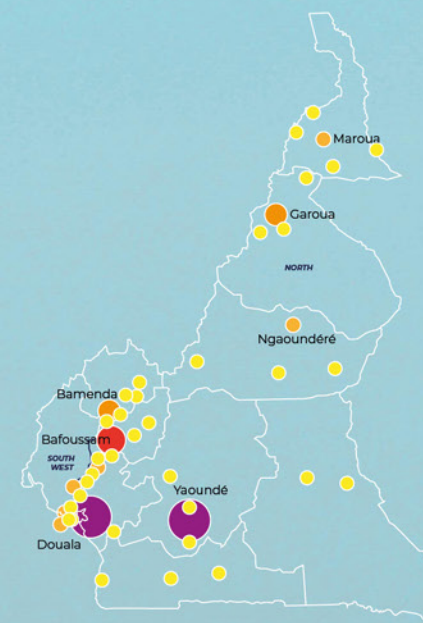




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# 02 URBAN PLANNING INNOVATION

Challenges and opportunities for resilient, sustainable and smart cities in Africa .....	32
Innovative solutions for a better African Urban Future .....	50
Interview with Jerome CHENAL .....	66



Bonanjo neighbourhood in Douala the economic capital of Cameroon



# CHALLENGES & OPPORTUNITIES FOR RESILIENT, & SUSTAINABLE CITIES IN AFRICA

CAPS: Public spaces as leverage for more inclusive and sustainable cities in Africa .....	34
Xpand: a new approach for more sustainable and smart cities in Cameroon .....	40
Governance’s role towards resilience in Kigali .....	44



An aerial view of the rural town of Limuru in the highlands of Kenya, Photo source imb.org





Dorothy Nyembe Park Soweto, Photo by Ayanda Roji

## CAPS: PUBLIC SPACES AS LEVERAGE FOR MORE INCLUSIVE AND SUSTAINABLE CITIES IN AFRICA

Despite attaining democracy in 1994, South Africa remains the most economically unequal country in the world. According to the 2018 World Bank report on poverty and inequality, previously disadvantaged South Africans hold fewer assets, have fewer skills, earn lower wages, and are still more likely to be unemployed (World Bank, 2018). This inequality extends to all parts of life, including access to urban green areas. A recent study on urban green infrastructure in South Africa found that parks occurred in neighbourhoods with 82% higher income on average than those without parks, a testimony to how colonial and apartheid spatial planning continues to haunt the South African urban landscape (Venter et al: 2020).



### “Redress of historical imbalances”

Racial segregation through most of the twentieth century influenced the distribution of and access to land and urban infrastructure such as green spaces. One study conducted during the Covid-19 pandemic noted how citizens in 'white'-dominated census tracts lived on average 700m closer to a park than the average distance for black (African, Indian and coloured) residents. Black Africans remain the worst affected, living on average the furthest from parks (1,7km). Further, other public infrastructure like highways and railway tracks also served to keep South Africans apart, and to consign black social groups away from the city and on the urban fringes through the design and location of dormitory townships (Venter:2020).

Apartheid spatial planning never intended to provide quality living conditions, with adequate community services and resources to the black population. Instead small cookie-cutter housing in the dusty, outskirts of the “white” cities were grudgingly built to ensure access to cheap labour. Green spaces, tree-planting and access to wider commerce and services was limited to the white community. Thus the values and priorities of the apartheid government influenced the current housing, green infrastructure and public space deficit. In this respect, providing low-income groups particularly people living in informal settlements and townships with good quality green and public spaces, where they can feel invited, welcome and safe, is not a “nice to have” but a necessity.

Since the formal demise of apartheid in 1994, the South African Government has made significant progress on many fronts in trying to redress historical imbalances and inequities. For example, access to basic services such as water, electricity, education and health care, social protection has improved considerably (World Bank, 2018).

Over and above the provision of basic services, more ambitious green and public space projects in South Africa have been implemented. At local government level, the justice-packaged drive by the City of Johannesburg (COJ) aimed to redress deficits in the provision of quality green and public spaces, specifically parks (GCRO,2013). The ‘Greening Soweto’ campaign, a 2010 FIFA World Cup legacy project, saw the development of parks and the planting of more than 200 000 trees in South Africa's biggest township, Soweto. The initiatives included the Klipspruit River and Klip River catchment project that sought to transform the dry and dusty landscape of Soweto into a green and vibrant corridor, conducive to healthy living.

Other campaigns include ‘My Dream Park’, a children’s design competition, as well as the ‘Xtreme Park Makeover’, an annual City Parks initiative aimed at garnering private sector support for the development of green spaces. The initiatives provided the disadvantaged communities better access to platforms of social interaction and engagement, as well as much needed green and recreational spaces. These greening projects also sought to address critical issues around sustainability. Notwithstanding the significant progress that has been made in addressing historical inequalities, the social and economic challenges remain profound.



## “ Post-Covid cities ”

The COVID-induced lockdown further intensified the significance of green and public spaces for those in informal settlements and overcrowded housing conditions, and without gardens to retreat to for physical, hygiene and mental health. In moving beyond the pandemic, cities should critically consider and recognize those disproportionately disadvantaged in terms of distribution and access to green and public spaces as a key part of moving towards a more inclusive, socially just and sustainable future.

The creation of new green and public spaces goes beyond quantitative provisioning only. Attention needs to be paid not only to the physical space itself but toward its meanings, functions, purposes, and relationships and connections to the city as a whole, since green and public spaces in Africa are also part of the social, cultural, and economic heritage and dynamics of a place. Neglecting such considerations, particularly in the wake of rising inequalities and injustices could exacerbate existing social, economic and ecological problems or even create new ones.

## “ Public space mapping ”

Primacy ought to be given by government institutions to conduct land audits, to understand the state of land availability in cities, as well as the nature, uses and ownership of the current critical land assets in order to plan for future needs such as housing and commercial usages. Unused land that can be earmarked for green and public spaces should also be identified and protected, with state land prioritised for public use. There are available and cost effective tools for conducting land audits or public space inventories and assessment. UN-Habitat Global Public Space Programme has been supporting a number of cities and partners on conducting public space audits, including Johannesburg, eThekweni, Nairobi and Addis Ababa. Using a free, open-source tool for mobile data collection, called 'KoBo Toolbox', the UN Agency train cities to assess the network, distribution, accessibility, quantity, and quality of their public spaces. The audit takes a participatory approach that allows community members to take part in the mapping and analysis of their green and public spaces. The assessment also identifies areas where there might be over-provision, poor placement and quality of public spaces and where there are



Kobo collect training Photo by Ayanda Roji

opportunities for improvement to meet the community needs (UNHabitat:2020). This is an important undertaking for African cities as reflected in the 8th Africities Summit Report of the session on “Overcoming the loss of urban green spaces in Africa”. Organized by the COJ and partners in Marrakesh, Morocco, in 2018. The session heard many raised concerns related to a growing trend of privatization, environmental degradation, grabbing of public land, and disappearance of public spaces which perpetuated unequal and segregated cities (Africities. 2018 report). Since data is limited and expensive to obtain and update in many African cities, the COJ partnered with the UN-Habitat to provide training for City practitioners from diverse departments, university students and community members on how to conduct public space mapping. The COJ recognized the importance of using this tool, extending its use to assess and make sense of homelessness, a prevailing issue in public open spaces. The tool is important as it provides data to monitor progress towards achieving the ‘New Urban Agenda’ and the ‘Africa We Want’ as reflected in the ‘Sustainable Development Goals’ (SDGs) and ‘Africa Agenda 2063’ aspirations respectively.

## “ City-wide strategy ”

Once the audit is completed, a city-wide strategy will be developed. Against the status quo, such a city-wide strategy will identify needs and demands and will help to crystalize a collective vision and goals through better management and development of green and public spaces. Although site or region-specific public space assessments are important, without a clear strategy or policy that takes the whole city into consideration it will be difficult to prioritize and quantify the amount of green and public space that should be redistributed, or to determine how benefits and resources should be re-allocated.

A city-wide strategy on green and public spaces can also identify gaps in the development of human settlements, ensuring better integration and sustainability. This includes developing human settlements in relation to existing substantive green and public space, particularly where the locality of such infrastructures were confined to more (racially and financially) exclusive neighbourhoods.

In many African cities there is potential for green and public space to be developed along river banks or urban ecological and natural zones. Thus it is important for these areas to be mapped, understood and designated as public spaces, and where, for example, linear green open spaces could be developed that accommodate suitable existing purposes to ensure cultural appropriateness to communities surrounding them (Toffa; forthcoming). For the COJ, this could include the planned revitalisation of the Klipspruit - Klip River project by creating park nodes of open spaces along the corridors of these two rivers. This is of paramount importance if these spaces are to be inclusive, protected, and sustained by the communities.

SDG 11.7 seeks by 2030 to ensure “universal access to safe, inclusive and accessible, green and public spaces”, while ‘Aspiration 1’ in the African Union’s Agenda 2063 calls for “a prosperous Africa, based on inclusive growth and sustainable development.” At the national and local level, the data will support the implementation and monitoring progress of the South African ‘Integrated Urban Development Framework’ (IUDF) on “Integrated sustainable human settlements” and the COJ’s priority 9 on “Preservation of resources for future generations”.



Minecraft workshop, Photo by Ayanda Roji



## “ All of society: tools and skills ”

A key part of moving cities toward a more inclusive and sustainable path is an ‘all of society’ approach adopted by all spheres of government, which embed ways for City governments to work with other stakeholders.

This includes a recognition of the central role of good quality networks of public spaces that promote equity, sustainability and safety, and involves a deliberate attempt by all key city stakeholders to give priority to areas that show the greatest deficiency of green and public spaces when considering development of new spaces and future upgrades.

An ‘all of society’ approach also considers co-management of parks and public spaces so that they work for and are relevant to the daily realities of the diverse stakeholders that use them (Benit-Gbaffou, 2018). Similarly, central to the development of city-wide strategies is the involvement of community groups in the planning, design and development of green and public spaces, since their input ought to inform and improve their use and management. This involvement should also extend to include marginalized groups, such as those experiencing poverty, homelessness, informal workers, undocumented or migrant workers, people with disabilities, or LGBTQ+ groups.

Two successful approaches to engaging vulnerable groups were employed by the COJ and the Community Participation NGO, Sticky Situations in the upgrade of End Street North Park situated in the inner-city. In the first one, the COJ partnered with UN-Habitat and Block by Block to train City practitioners and community members on how to utilise the Minecraft video game as a participatory approach in co-creating green and public spaces. Through the use of the video game, input of children, women, waste recyclers and those facing homelessness were solicited around the project, particularly around how to co-create spaces and facilities that support their daily navigation of the city. In the second one, the COJ collaborated with the GIZ Violence and Crime Prevention Programme (VCP) to undertake community mapping with women, to understand the hotspots for crime in their neighbourhood surrounding the park. Through the use of these approaches, input of children, women, waste recyclers and those facing homelessness were included in the design and management of End Street Park.



While the ‘all of society’ approach offers a wide range of opportunities, it also comes with multiple challenges as green and public space are not neutral spaces, particularly in cities like Johannesburg. They are frequently contested spaces due to varied ways in which they function, and are used and valued by different segments of society.

Building a social contract through establishing common ground requires continued and long-term engagement with communities and other users. Engaging creatively and meaningfully with diverse stakeholders and community groups who tend to have different needs, expectations and interests requires critical skills to convene and curate inclusive conversations and processes. However, City practitioners who manage green and public spaces generally have no professional training for such engagements (Bénit-Gbaffou, 2018).



## ” THE CENTRE ON AFRICAN PUBLIC SPACE

With capacitated government, empowered and active communities, adequate political support and funding, a city-wide public space strategy has a potential to deliver a well-distributed, accessible and inclusive public space system that reflects the social integrated reality of people. These are the considerations of the emergent Centre on African Public Space (CAPS), a Pan African Platform for preserving and reimagining green and public spaces through capacitating city practitioners, community mobilisation, collaborative research and teaching, reflection and knowledge exchange. The future inclusive and sustainable African city has green and public spaces at its centre and the many hands that build and shape cities working together forming and building an equitable society in these spaces.



“ A smart city is fundamentally cultural... ”

For Xpand smart city doesn't necessarily mean technology, but mostly how to develop innovative approaches and solutions that work for everyone. A city is sustainable in its art of keeping alive solutions that are essential for our well-being and for future generations. Therefore, such a city is at the service of human beings and starts from human beings, in consideration of a balance with regard to its spatial environment. Xpand is convinced that the Smart and Sustainable City is a reflection of the culture of its citizens - the sustainable city is fundamentally cultural. It is driven by the values of its citizens and the relationship they share with their natural environment. Culture constitutes the core spirit of the city and thus brands the difference between other territories. Aware of this, the city's stakeholders must know how to design local development models that fit their needs and are more or less strongly associated with their cultural foundations.



Edea city, Photo by Edea city council

## XPAND: A NEW APPROACH FOR MORE SUSTAINABLE AND SMART CITIES IN CAMEROON

In Cameroon, the gradual implementation of the decentralization framework now presents the local communities (the “Communities”) as the main institutional interlocutors of local development. However, the transfer of competencies to Communities requires them to adapt their material, human and financial capabilities to the challenges of local development. Decentralization then becomes an opportunity for Communities to reinvent themselves and transform their territories in a sustainable way by stimulating citizen participation and better dialogue between public and private actors.



Innovation Collaborative Cameroun, Illustration by Xpand



## “Infrastructure are at the heart of Smart and Sustainable City...”

The identification of urban issues, in particular their relationship to infrastructure, is becoming more complex due to the interaction and interdependence of the various networks (energy, water, transport, telecommunications, etc.). In addition, infrastructures are under pressure from demographic, socio-economic, and environmental factors that require an adequate management system to ensure their performance.

Xpand's methodology therefore aims to improve the planning and preparation of infrastructure projects, in order to ensure their contribution to the provision of quality urban services and a measurable impact on the economic, social, and environmental development of territories. The capacity to plan and prepare urban projects guarantees better financing and optimized citizens' participation.

In a context of ever-accelerating decentralization, Communities must be able to access alternative financing solutions for their development.

Access to funding from partners, commercial banks, or the private sector requires better planning and preparation of projects. As the city is a complex socio-economic system, this planning and preparation of development must be done in a participative approach, within appropriate collaborative frameworks to maximize the emergence of innovative, inclusive, and sustainable solutions. It is essential to genuinely involve as many stakeholders as possible in the decision-making process in order to develop solutions that best serve individual and collective interests.

The participation of the private sector should be encouraged through the development of broader expertise in Public-Private Partnerships (“PPP”), which constitute an appropriate framework for the design, planning, and management of infrastructure projects. The State of Cameroon also provides a set of institutional support tools to help strengthen the capacities of Communities via its technical supervisory bodies, like ministries, public financial institutions, technical support institutions, etc..

## “Edea smart city...”

Edéa is a city located along the Sanaga River in Cameroon's Littoral Region. With more 200 000 people, the city is facing many challenges related to rapid urban development. Aware of these challenges, the Edea City Council is committed to transforming its territory into a Smart and Sustainable City. In that sense, Edea aspires to become a prosperous economy with efficient infrastructure, while being creative, innovative, smart, and respectful of the principles of sustainable development. However, faced with the limited financial resources and the reduced participation of the central government in the financing of local development, the mayors must now adjust their local strategy for sustainable development.

To this end, Xpand has committed to accompanying the City of Edéa in a process of sustainable transformation so that this new development vision could be implemented on its territory. This transformation requires access to alternative sources of financing, particularly private financing, the attractiveness of

which requires the establishment of a specific model of governance. As a strategic crossroads between Douala, the main economic pole of Cameroon, Yaoundé, the administrative and political capital, and Kribi, the port and seaside city, the City of Edea has proven potential in various sectors and enjoys an ideal geographical location for the development of the local, regional and national economy.

In order to comply with supranational commitments, Edea is aligned with the objectives of the National Development Strategy 2020 - 2030 (SND30), which aspires to transform urban centers into competitive, attractive, sustainable, resilient, and inclusive cities, notably with the Sustainable Development Goals (“SDGs”) as performance indicators.

Xpand's support aims to (i) improve the preparation and planning of the City of Edea's infrastructure, (ii) develop an enabling framework for collaborative innovation and citizen participation, and (iii) stimulate participatory and innovative financing to realize its intrinsic potential. Beyond all these organizational tools, urban and collaborative innovation must strive to «serve for the common good».



Sanaga river, Photo by Edea city council



## THE CITYLAB – URBAN INNOVATION LAB

In 2019, Xpand launched the implementation of its CityLab to improve support to Communities. This structured collaborative platform aims to optimize collaboration between actors for better urban planning. The feedback from the city of Edéa and many others has made it possible to identify the main challenges of decentralization, but also its opportunities for local development through collaborative innovation.

Of course, and beyond all these organizational tools, urban and collaborative innovation must strive to «serve for the common good».





Kigali, Photo by Portraitor from Pixabay

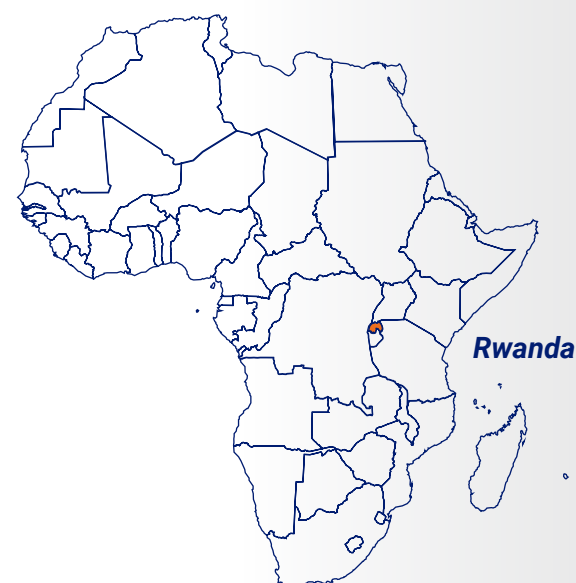
Rwandans needed and deserved in order to have a good quality of life, have their needs met, and raise the GDP. Vision 2020 (recently replaced by vision 2050) was a long-term framework to guide the country's development for the next 20 years. It was a set of goals to be realized in all sectors. These goals are set by different stakeholders, including political parties, civil society, the private sector, faith-based organizations, youth leaders, educational institutions, etc. From that vision, priorities are identified and that is how Economic Development and Poverty Reduction Strategy (EDPRS) short and medium-term goals are initiated for a period of 5 years at a time. This vision leads to the governance that is the pillar in making Kigali a resilient city.

Resilience is defined as the ability to recover from shocks and stresses, both natural and man-made. This is measured economically, environmentally, socially, and institutionally. Thus, why many actors are necessary to achieve resilience. In Kigali, the government has in place policy and implementation institutions to drive the realization of EDPRS and Vision 2050 leading the city towards resilience.

For a country that relies heavily on its natural environment, environmental degradation was identified as one of the major obstacles facing the EDPRS and Vision 2020 realization. Contributing 31% to the Rwandan GDP, the Agriculture sector alone employs 70% of the working population. Challenges facing the natural environment such as land degradation and soil erosion were addressed head-on.

## GOVERNANCE'S ROLE TOWARDS RESILIENCE IN KIGALI

**N**eat streets with no potholes nor trash, palm trees, green grass, sufficient public lighting; this is the first image of Kigali city upon arrival. It is clear this is not your typical African city, at least not how they are portrayed in international media. The amount of effort that is made by municipal authorities to maintain the city clean is obvious. However, a lot more is required to make Kigali a resilient, sustainable, and smart city, and the Rwandan government is conscious of that. In the wake of the Genocide against Tutsi in 1994, Rwanda was facing an unprecedented challenge, a devastated nation in terms of human and public capital, infrastructure, and the nation's soul in general. At the end of the twentieth century, the country would embark on a great mission to rebuild itself from scratch. Rwanda Vision 2020 was launched in the early 2000s, out of a collective reflection on what kind of country



Bamboos planted along Nyabugogo river to strengthen the soil, 2021, Photo by Bantu





Soil degradation along Nyabugogo river, 2021, Photo by Bantu

### “ The challenge of restoring natural areas...”

The city of Kigali is built on three hills, and the valleys are occupied by rivers and wetlands. These are habitats for diverse species, and it is where agricultural activities mainly take place. The challenges the city faced in this journey were unplanned settlements on steep hills which are subject to land erosion during heavy rains, destroying homes and businesses, taking lives, and carrying sediments into rivers and wetlands. The Rwandan Ministry in charge of Emergency Management recorded a total number of 7,769 houses and 4,437.5 Ha of agricultural land destroyed due to landslides, floods, and rain storms across the country in 2020 alone. Other challenges are homes and businesses such as factories, hospitals, etc. built inside wetlands boundaries which create water pollution, destroying crops, threatening biodiversity, and causing water shortage.

The Ministry of Environment (formerly called the Ministry of Natural Resources) in charge of policies, partners with implemental agencies such as REMA, FONERWA, and the City of Kigali as primary actors in the efforts towards turning Kigali into a resilient, sustainable, and smart city. REMA, the Rwanda Environment and Management Authority was funded in 2005.



Species living in wetlands2, 2021, Photo by Bantu

Among its remarkable achievements, we can count implementing the ministerial order banning the use of single-use plastic shopping bags in the country which was a threat to the environment due to its non-biodegradable characteristics. REMA's ongoing effort is also on the restoration of degraded natural forests to promote biodiversity and protect communities around them against natural disasters, reducing the use of charcoal as cooking fuel in homes to save trees and reduce greenhouse gases emissions, and joining efforts with the City of Kigali and the Ministry of Environment to expropriate properties on wetlands or within close proximity to wetlands, and many other initiatives.

In another effort to add more greenery inside the city, Kigali City plans to increase public spaces throughout the city. To reduce pollution and traffic congestion inside the city center, one road by the Kigali city office was made car free, where a public space named Imbuga. City Walk is being built to provide a space for relaxation, interaction with nature and socialization.

Founded 9 years ago FONERWA, the Rwanda Green Fund is a key partner funding these various projects. It was established to secure funding for projects supporting a sustainable, resilient, and smart future. In Kigali city specifically, among other projects, FONERWA is currently engaged in rendering neighborhoods around Nyabugogo river and wetlands flood proofed, and with GGGI, the Global Green Growth Institute Rwanda chapter as a partner, FONERWA is providing new models of moto-taxis, public buses, and other means of transport that consumes electricity instead of the air-polluting alternative that is petrol.



An exhibition in Kigali car-free zone, 2021, Photo by Bantu



## “ Green and affordable neighborhood for a rapidly growing population...”

A rapidly growing city, the National Institute of Statistics of Rwanda projected the Rwandan urban population to be twice what it is now by 2050. This is the biggest challenge for Kigali. The already existing lack of affordable housing and rate of unemployment once increased, will threaten the journey towards resilience.

Together with FONERWA, Kigali recently launched Green City, a project to design and build a green & affordable neighborhood for low and medium-income urban dwellers covering 600 ha on Kinyinya, an upcoming neighborhood in Kigali. First, of its kind in the region, it aims to be a model of sustainable urban development, promoting green buildings, renewable energy and minimal ecological footprints while creating jobs and giving back to local communities using local materials and labor.

This model neighborhood is a good initiative because the housing sector is lagging behind in contributing to resilience. The detached single-family house is the go-to model when building homes in Kigali and Rwanda in general. This is not a sustainable use of land, since the country is already densely populated (ranked second-most densely African country in 2020). The construction industry, in general, is also contributing to the hundreds of millions of dollars in imported goods every year. The country has been putting effort in strengthening local industries in order to reduce imports, but it still has a long way to go. Made in Rwanda campaign and initiative is a result of this effort. Since Rwanda banned the import of secondhand clothes it highlighted issues in the clothing industry, where most locally made clothes are high fashion or bespoke items, hand sown and therefore too expensive to meet the needs of the population.

## “ The Resilient Cities Network...”

Among opportunities rising on this journey towards resilience is that Kigali is part of the Resilient Cities Network, an initiative launched by The Rockefeller Foundation in 2013 to celebrate its centennial anniversary as a philanthropic Foundation. 100RC, 100 Resilient Cities aimed at helping cities on their journey towards resilience. These cities were helped in developing resilience strategies and implementation plans tailor-made for each city to cater to its specific challenges. Kigali is given an opportunity to learn from other cities and receive help from experts in developing its resilience strategy. More effort will be required with the implementation of the roadmap, and the monitoring and the evaluation of what is being implemented to make sure the goals relevant to different sectors are being met to make the city resilient. This is crucial because many good projects can be realized but if they

are not leading towards resilience, they will be short-term. Personnel in charge of resilience monitoring and evaluation is therefore needed in every policy and implemental institution.

The city is a complex system with numerous integral parts. Each part needs to be resilient for a resilient whole. Water, air, wetlands, forests, biodiversity, human capital, economy, etc. In order to achieve a resilient city, each individual has to play a role. The same way Kigali residents and visitors know better than to throw a napkin or water bottle on the street, the same way it will require awareness among all the authorities, professionals, residents, etc to work together to achieve resilience.



Detached single-family houses in Rusororo residential neighborhood, 2021, Photo by Bantu



# INNOVATIVE SOLUTIONS FOR A BETTER AFRICAN URBAN FUTURE

AGORA : Sports and culture for more inclusive cities in Ivory Coast .....	52
SMART without SLUM, in Quelimane, Mozambique .....	56
How drones facilitate land titling in DRC .....	60



The skyline of downtown Nairobi Kenya, Photo source imb.org.jpg





BirdView 2019 AGORA Koumassi, Photo by AGORA

Inside the sports complex, a modular structure made out of reconditioned shipping containers hosts several social impact companies (i.e : NGOs working around woman alphabetization, social entrepreneurship, professional insertion for athletes, a small library, a cyber, a hairdresser school, a café, a medical center, etc). The AGORA also hosts regular cultural events around health and wellbeing, disabilities, professional insertion, sustainable cities, arts, and culture (ex : Beyond-the-Walls representation of the Abidjan Circus Festival, the local Sculptor association artistic residency, outdoor cinema, etc).

The program just got extended to 10 more locations (5 in Abidjan, and 5 in the countryside) where construction is expected to start in 2021. In total, the AGORA program will cover 30+ locations all across Ivory Coast, and will also develop in Senegal, as well as other countries across the continent.



## AGORA : SPORTS AND CULTURE FOR MORE INCLUSIVE CITIES IN IVORY COAST

The AGORA program offers innovation in the field of urban sports and cultural hubs for disadvantaged neighborhoods in Ivory Coast. The first space opened in 2019 in Koumassi, a low-income neighborhood in Abidjan, where the sports field was closed for several years. With the co-financing of the Ivory Coast Ministry of Sports and the French government, the AGORA now welcomes over 3000 kids from local schools every day for physical education programs. The spaces enable people from the neighborhood to play basketball, handball, football, martial arts, use the running tracks, and sign up for private classes including Zumba, dance, fitness, etc. Specific time slots are reserved for women to encourage feminine sports practice.



Les Reines de l'Alphabétisation - 2021 - AGORA Koumassi, Photo by AGORA



## “ A multi-use space in dense urban areas...”

The AGORA serves as a multi-purpose space. Located in a dense neighborhood, its design geometry (3ha space of enclosed surfaces) serves as a public space : people come to enjoy the shade, walk with their families on the weekends, watch a game, meet for a romantic date...

The flexibility of the space allows different setups to host a multitude of activities : sports competitions, concerts, open-air cinema, food courts, business meetings, etc. This model is a great experimentation for the diversification of the uses in one space, around the clock, as a way to contain urban sprawl. Some tenants inside the AGORA offer access to services at the scale of the neighborhood : health center, library, etc.

## “ An innovative and replicable business model...”

Moreover, the concept of the program is based on economic self-sufficiency, with 4 revenue sources : Rental of sports fields ( affordable prices i.e 2000 CFA for 1h of basketball court, discount prices for local sports associations, long-term discount for clubs, etc); Rental of workspaces/commercial units; Privatisations of part of or the full space (for private events, private competitions, concerts, after-works, etc); Sponsoring (visibility for brands, sponsorship in money or sports equipment).

This business model allows to cover the operational charges (staff, electricity, and water) and to ensure a steady maintenance of the different sport and cultural infrastructures, which is one of the main challenges faced by public authorities in Ivory Coast.

The construction is financed by public funds, and the land is owned by the Ivorian Ministry of Sports. The program is a public service delegation contract, operated by a private Ivorian-French company (Winwin Afrique) before being returned to the branch in charge of the exploitation of infrastructures in the Ministry of Sports.

## “ Sustainable goals for sports infrastructures...”

Part of the electricity in the offices and commercial units is powered by solar panels, located on the roof of the structure. The units are upcycled shipping containers, stacked on a supporting Frame. A plastic recycling unit is present on-site, and operated by AIVP, a local NGO. The AIVP (Association Ivoirienne de Valorisation du Plastique) buys plastic from local collectors (75 cents/



Karate kid - 2021 - AGORA Koumassi, Photo by AGORA



Circus Abidjan Festival (RICA) - 2021 - AGORA Koumassi, Photo by AGORA

kilogram) and sends it to the recycling center in the north of Abidjan. Approximately 94 tons of plastic were collected last year.

Recycling bins were implemented on-site a few months ago, along with an awareness campaign on sustainable development for all the users of the space. These programs are expected to have an impact further than the space itself, with schools from the direct neighborhood and the rest of the city taking part.

## “ A site-specific and placemaking program...”

The pilot was inaugurated in 2019 in Koumassi, and the model has greatly evolved since then. Several adjustments were made, such as : adding food camp; beverages, modifying the distribution of sports fields to optimize the space and the operational model, moving the locker rooms to facilitate access, etc. This flexibility of the space is what makes the program interesting from an urban planning perspective : This is one of the first examples of experimentation, site-specific and agile methods being applied to a sports infrastructure in the Ivory Coast and globally. This means the other locations will not be a copy-paste of the pilot site, but the blueprint will be adapted, according to the needs and desires of local populations.

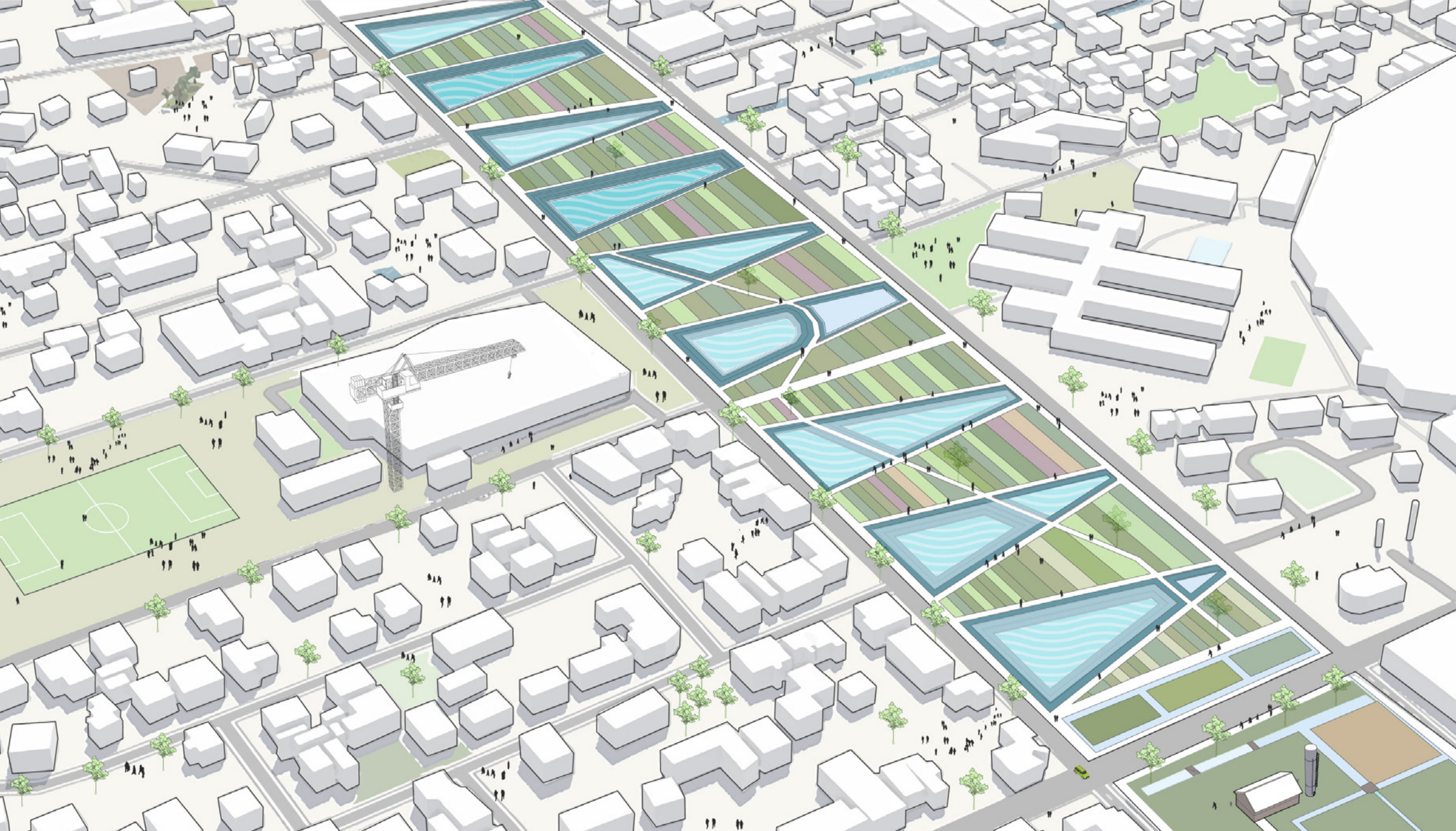
An “ecosystem study” is being conducted before the start of the works, to identify the local actors, schools, federations, associations, women groups, businesses, and entrepreneurs as well as traditional chiefdoms and collectively map out the needs and opportunities of the local AGORA.

The business model, as well as the architecture of the site, will differ according to its local environment (urban or rural) and stakeholder needs. The exploitation model will remain identical, although in rural areas, the structure will be smaller, composed of fewer units, and the emphasis will be put on sustainable agriculture. An important training course (online and on-site) will be offered to train locals for every aspect of the management of the AGORAS : hospitality, programmation, security, general maintenance, green spaces, and development of a healthy soccer field lawn.



The AGORA program goes above and beyond to cover every aspect of a sports and cultural complex, from construction to operations, social impact, and training of the next generation. <https://agorakoumassi.com>





The citypark, source IMM Design Lab

## SMART WITHOUT SLUM, IN QUELIMANE, MOZAMBIQUE

Africa possesses one of the fastest-growing places, ranging from small-sized to metropolitan cities, which enormously expand horizontally and vertically in unbridled dimensions. Besides, the current population (1.1 billion) is expected to double by 2050. Although the speed of this development has demonstrated the capability of building large-scale and expanded urban areas, there is a substantial need and guidance towards sustainability. Further, the quickest and the most problematic growth in Africa's urban landscape is happening in smaller and medium-sized cities.



According to the fragile cities data, there are 528 African towns with populations over 250,000 which require immediate attention from planners, engineers, designers, and the government.

As such, SMART without slums seeks to build a sustainable, adaptable, and scalable model for medium-sized cities in Sub-Saharan Africa.

SMART without slum, a research-based project, is developed by three Architectural Engineers (Solomon Tamiru, Frank Otuo, and David Gyampoh) studied at Politecnico di Milano and it was supervised by the director of [IMMdesignlab](#), Professor Massimo Tadi. The project employed IMM (Integrated Modification Methodology) as a research method to construct the theoretical framework.

Furthermore, the relationship between IMM and SDGs (sustainable development goals) is explored to produce prototype schemes in a variety of scales.

Quelimane, a medium-sized city with populations above 400,000, is situated along the coastline of Mozambique. It is also the administrative capital of Zambezia province and a seaport serving for exporting agricultural crops from the region. The two important aspects of the project are 1) The slum-upgrading approach is based on the concept of integrated strategy involving all the different systems of a city (waste, water, food, energy, mobility, ecosystem services) and considers both formal & informal settlements as systems of systems, 2) The outcome of the project is replicable in similar urban contexts.

The findings of this research indicate that Quelimane has encountered an overlapped environmental and urban glitch that hinders the ambition of its development. On one hand, climate change affected the city in terms of rising sea levels, cyclones, and flooding during the rainy seasons, on the other hand, the rapid urbanization which triggered by factors such as rural-urban migration, seeking employment opportunities, and etc. has facilitated the speedy emergence of slums and informal settlements. Tackling such a complex issue needs an integrative, multiscale, and holistic approach. In this sense, the research team has reviewed multiple slums upgrading and intervention plans however, the past practices give emphasis on a single sector involvement solution like eradicating the slums or relocation programs. This type of approach has created a different form of challenges such as homelessness and diminishing small-scale local business formerly established in the slums.

On the contrary, this research seeks to approach the problem from a different perspective by applying IMM methodology. In this methodology, the city is considered as a dynamic Complex Adaptive System (CAS) comprised of the synergic integration of a number of elementary parts, which through their arrangement and the architecture of their ligands provide a certain physical and provisional planning of the CAS [6]. As such, Quelimane is taken and studied as a complex adaptive system and it is evaluated through the four phases of IMM namely: Investigation, Formulation, Modification, and Retrofitting. All phases are independent but fully integrated.



## “ IMM methodology: Investigation, Formulation, Modification, and Retrofitting... ”

In the first phase, Investigation, 28 neighborhoods (taken as global scale) were selected (selection was made based on data availability and location of slums.) and investigated horizontally and vertically including performance evaluation. The horizontal components of the city, based on IMM, are Urban Volume, Urban Void, Links, and Types of Uses whereas the vertical elements are formed as a result of interaction between two elements of horizontal elements and resulting: Porosity, Permeability, Proximity, Diversity, Interface, Accessibility, and Effectiveness. And then, the two weakest neighborhoods (taken as Intermediate scale) were identified for further analysis, one located in the city center and the other where most of the slums are situated. In this first phase, numerous properties of Quelimane's urban environment like the physical arrangement of the building blocks including the Slums, car dependency, connectivity, functional planning, and the performing means of public transportation were examined.

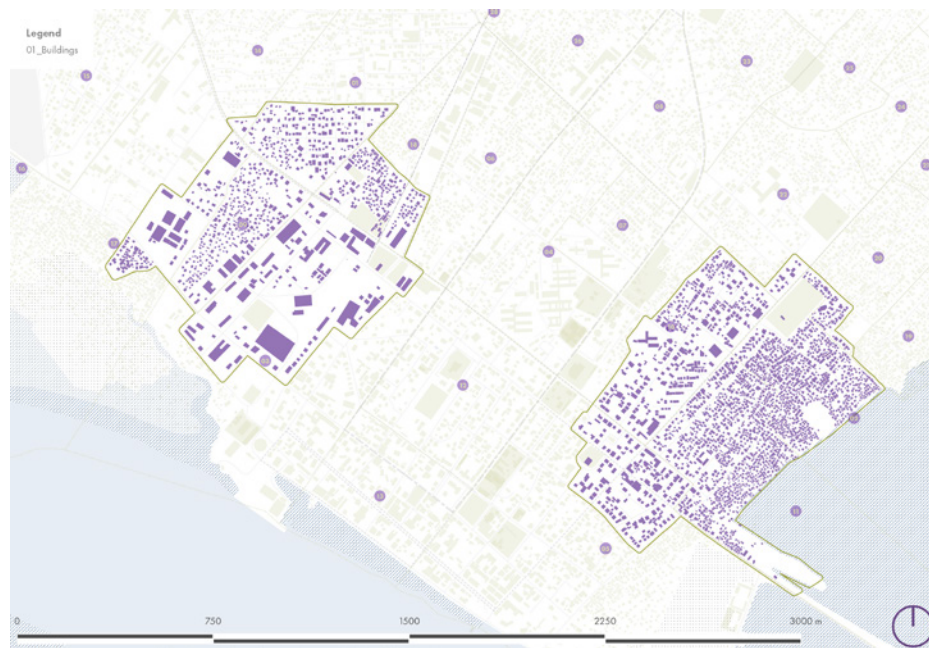
Secondly in the Formulation phase, the malfunctioning elements from the horizontal and vertical investigation were identified as a catalyzer of the transformation. In this case, the Urban links (horizontal catalyzer) and the Accessibility (vertical catalyzer) were found to be the feeblest subsystems in the study area. Furthermore, the DOPs (Design Ordering Principles) were arranged according to the behavior of the city. DOPs are not a fixed list of design recommendations but rather a dynamic and active structure of integrated Design Principles every time being arranged by considering the specific conditions of the CAS, and specifically organized to deal with the local weaknesses of the system. The relationship between IMM, SDGs (specifically goal no 11), and urban infrastructures (food, energy, water, waste management, & mobility) is also studied here and a thematic intervention tool called SMART is created. SMART is an acronym having various prototype projects and stands for; Soft, Multilayer, Agritecture, Robustness, and Technology. SMART, as an intervention tool, is applied from the Global scale (28 districts) to Intermediate scale (two special districts) to finally the Local-scale (design site).

The third phase, Modification or Design, is where the synthesized assumptions and the design ideas are applied. Findings from the IMM revealed that the city as a complex adaptive system has areas that could be improved. These enhancements targeted three major challenges of Quelimane, the disconnected transportation system, the flooding & rising sea level influenced by climate change, and the growth of slums & informal settlements. Further study of SMART in relation to the city hinted at major prototype projects that could enhance the urban context.

Consequently, a range of prototype projects was integrated into three levels of scale, the city scale (global), the intermediate scale (neighborhood), and the local scale (site). The first one involves prototype projects such as the city park, bus rapid transit, and the green belt. The city park and the green belt create connected green spaces, initiate the existing biodiversity, protect the city from flooding by storing water as city ponds & permeable ground, and promotes walkability & cyclability whereas the bus rapid route encourages public transportation together with the integrated bike lanes.

Secondly, the neighborhood scale intervention introduced communal farms, water borewells and promotes small businesses as bike café. These prototypes would help to encourage social life while gardening together and generate revenue from trading between the locals. The last category which is the local scale contains a prototype of Affordable & incremental housing, designed using locally available materials (Bamboo, timber, and shipping containers) and modern techniques such as ventilated façade.

The optimization phase is the fourth and last stage of the IMM. At this point, although the system is expected to perform much better than it does in the actual situation, transformation is an endless process. Therefore, to double-check and assess the implemented prototype projects on both the Global and Intermediate scales, an investigation the same as the first phase was conducted. The maps and figures obtained through this process help to compare the original situation to the new retrofitting. The transformation is an endless process and the system just converted to a new threshold.



selected intervention areas, source IMM Design Lab



Affordable housing, source IMM Design Lab





protected nor secured by any official documents, leaving residents vulnerable to land conflicts, including threats of land grabbing and eviction.

Efforts to produce official land titles have been hampered by the absence of accurate data, outdated land management systems, and the lack of spaces for dialogue between community members, land stakeholders, and local authorities. Consequently, the DRC Government is undertaking regional land planning reforms to resolve, among others, the duality and the conflicts it entails between the customary chiefs' law and the land legislation authorities.

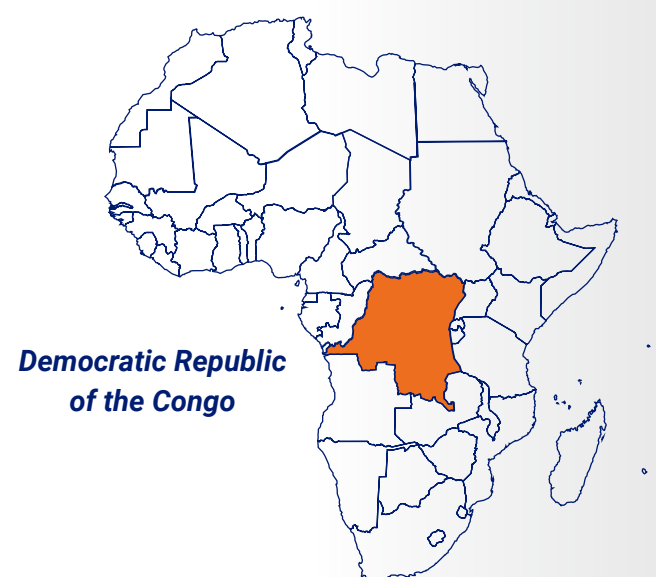
*"In the current situation, there is a severe lack of data and modern tools which creates clutter and impacts the living of the local poor communities,"* explains Barthelemy Boika, Technical Director of IRDAC, a development organisation working alongside local authorities and communities to address land tenure issues.

As part of this effort, [IRDAC](#) implemented the pilot project Drones for Land Clarification and Empowerment of Women - Modernizing land governance in the Democratic Republic of the Congo, in Kasangulu, with financial support from [Cities Alliance](#).

The pilot is a multi-part project that includes the facilitation of communication among all land stakeholders, the introduction of new land management tools, and the promotion of inclusive economic development based on secure land rights.

## HOW DRONES FACILITATE LAND TITLING IN DRC

Kasangulu is a small town in the Democratic Republic of the Congo (DRC) located just 35 km southeast of Kinshasa, a fast-growing megalopolis of nearly 15 million people. The urban expansion of Kinshasa is creating pressure on rural Kasangulu, as wealthy Kinshasans seek opportunities to acquire land on the outskirts of the megacity. By contrast, the community of Kasangulu consists mainly of poor farmers, including many women who are the main breadwinners for their large families. Most people in Kasangulu do not have formalized rights for their land. By customary tradition, Kasangulu families received land allocations historically and have "owned" the same parcels for generations – but without any legal or official tenure documents that prove their ownership. This duality has created insecurity as these lands are not



Training\_Drones, Photo by Cities Alliance

*"Achieving tenure security, land and property rights in informal urban settlements remains one of the most persistent, intractable development challenges today. The situation is particularly acute in Africa, which is experiencing very high population growth rates, notably in its small and medium-sized cities. In Kasangulu, DRC, a local organization is collecting data with drones and working with the communities and the local authorities to secure land titles."*



Capturing data with drones Photo by Cities Alliance



## “Bringing all actors together...”

A key goal of the IRDAC initiative was to set up reconciliation of all the stakeholders and open the dialogue among residents, traditional chiefs, concerned authorities, and the private sector, so that each party involved in land issues would have the opportunity to talk and work together, to respond to the challenges identified and propose joint solutions. This was done by conducting stakeholders and conflict mapping and establishing participatory workshops and events. During the process, it was noted that most residents in Kasangulu were unaware of the risks associated with the insecurity of informal land tenure.

This lack of information on why and how to formalize land rights, together with households' limited purchasing power, helps to explain the low access of local communities to land titles. Out of 116 community members consulted during the process, only one person had an official registration certificate. The participatory workshops provided a unique space for all actors to gain a holistic understanding of the land issues at play in Kasangulu and at different stakeholders' responsibilities and rights.

The way forward agreed by the stakeholders involved the integration of new technologies with community participation. As part of this process, topographic drones and mapping software were used to help the land registry administration migrate from paper documentation to digital.

As a first step, IRDAC provided technical training for youths and land agents to be able to operate the drones.

*“The project brought new technologies to an administration that didn't know how to use them. In line with our social commitment and the purpose of the project, we have trained 14 young women and men from the local community, and 8 local authority representatives who were interested by the drones handling, data collection and field surveys trainings”,* said Boika.

The introduction of civilian drones to the land management system has facilitated the collection of accurate data in real-time, but also helped to draw attention to the subject and reinforced the need for public support to secure land properties.



Multi-stakeholder dialogue, Photo by Cities Alliance

Another facet of the pilot was to help the administration modernize its management tools and to establish a digital and automated cadastral database that addresses key questions, e.g., How many parcels are in Kasangulu? What are their surface areas? Where are they located? The data collected by the drones and GIS tools has been verified and completed by field surveys.

*“The data images collected by the drones are silent data. You must go on the field to find out who owns which land. Then you compile both to get attributive data”* added Boika.

This process is key for the formalization of land and property rights, and the granting of land titles.



Training\_Drones, Photo by Cities Alliance



## “ Building social resilience and sustainability... ”

By providing them with a legal foundation, the project contributed to securing the rights of the local communities and increasing their resilience. Households with a secured land title can access microcredits, which are especially helpful for women-headed households - often the most vulnerable to land insecurity. According to Boika, the land title becomes a means of subsistence for the families and their children and creates a virtuous circle. *“Owning secure land titles enables them to obtain microcredits, start income-generating activities and improve their living conditions and well-being.”*

Women in Kasangulu have been very involved in this project: *“40 to 50% of them own a land parcel that this project is helping formalize and digitize”* he added. However, although women were the focus of the economic development activities and expected to benefit substantially from the potential micro-credit loans, due to the Covid-19 pandemic many projects are currently on hold.

The pilot initiative has also a strong potential to bring about sustainability and environmental resilience by providing the Kasangulu authorities with accurate and updated geographical data. This will enable them to monitor and manage the expansion of the town to protect the surrounding green areas from urban expansion. *“Kasangulu is bordered with forests. And when a city expands, it cuts into the forests and its surrounding environment because the corresponding information is neither available nor secured.”*

Nevertheless, the initiative would have no future if the lessons learned are not brought up to a legal level, especially within the context of the DRC Government reforms.

*“Innovations and lessons learned from Kasangulu have been brought to the government’s land certification authority so that they can translate these experiences into legal frameworks and integrate them in the national policy of regional planning, to enable the provinces to digitize the land cadastre, later, nationwide when resources will be available,”* said Boika.

There is also a need to build the capacity of the administration and to integrate innovation in land management systems, and a tailored interactive program for land registry management should be introduced.



Final event to discuss results Photo by Cities Alliance



Training\_Drones Photo by Cities Alliance

## “ Technology alone is not sufficient. Participatory dialogue is required... ”

The IRDAC initiative is in line with current land policy in the DRC, in terms of the integration of technological innovation and efficient land management systems. The pilot project shows how digitization can be used to legalize customary land deeds and secure communities' land parcels but, above all, it shows that an inclusive system can only be achieved by maintaining effective and participatory channels with all the stakeholders involved. With its social and environmental impact, the initiative also demonstrates the importance of land titles in the pursuit of inclusive development.

*“This project showed how technology alone is not sufficient. Its main innovations were the establishment of a space for participatory multi stakeholder dialogue, together with the use of the drones. This is why this project is opening up new opportunities for us to work with other partners and institutions.”*

Access to land with secure tenure is now recognized in global development agendas giving the issue a considerable boost. While this global focus is encouraging, change does not need to happen exclusively at the national policy level. Urban poor individuals and communities are essential actors in strengthening tenure security, and small-scale, short-term incremental solutions can be key to improving tenure security and housing conditions, and to city-building.

Through the *“Secure Tenure in African Cities: Micro Funds for Community Innovation”* initiative, Cities Alliance awarded grants to organisations that like IRDAC are innovating to improve tenure security, land and property rights in African cities at the local level. The initiative was financed by Omidyar Network, with support from PLACE.

**Cities Alliance**  
Cities Without Slums

Hosted by  
**UNOPS**

## ABOUT CITIES ALLIANCE

Cities Alliance is the global partnership fighting urban poverty and supporting cities to deliver sustainable development. Hosted by UNOPS, the organization has 23 members including multilateral institutions, UN agencies, governments, non-government organizations, local governments, and city networks. Our core topics of work include gender equality, migration, climate resilience, and innovation, with a focus on informality.



# INTERVIEW WITH JEROME CHENAL

Interview with Professor Jérôme Chenal Academic Director Excellence in Africa (EXAF - EPFL), a new initiative jointly launched by EPFL and UM6P which aims to have a significant impact on excellent scientific research throughout the African continent.

In this interview conducted by Patrick Emmanuel Somy at Abidjan in Ivory coast, the themes mentioned are the challenges of African cities, the role of education in urban studies for more sustainable cities in Africa, the models of the urban planners of tomorrow, the vision of the African city of tomorrow, etc.

WATCH HERE

YouTube





# 03 ARCHITECTURE INNOVATION

People-centered Architecture .....	76
Innovative architecture projects .....	90
Interview with Hayatte Ndiaye, President of the National Order of Architects of Chad .....	100







Friendship park Addis abeba Ethiopia photo by yohannes minas unsplash.com

## BIM APPROACHES FOR MORE SUSTAINABLE AFRICAN CITIES

**B**IM (Building Information Modeling) is a concept of data visualization, which allows combining graphical representation and modeling of information (integrated or generated data).

The use of BIM, a precise and flexible tool, offers greater visibility in obtaining and managing information for a more versatile organization of spaces. The preview (a major asset of digital), thanks to virtual models informs and helps in the production of useful data, leading to dynamic decision-making. It is a preparation and anticipation tool that will greatly help Africa to conceptualize effective management of urban agglomerations.

*«BIM is a dynamic tool for preparation and anticipation that will greatly help Africa to conceptualize effective management of urban agglomerations.»*



### “ Urgent use of intelligent programming...”

According to UN estimations, the continent's urban population has doubled in the space of 20 years, reaching 475 million people in 2015, and should approach one billion by 2025. The lack of realistic strategies and readability (most cities do not have urban development plans) associated with constant demographic expansion and spontaneous urbanization, will not improve the living conditions of the inhabitants.

Added to this is the fact that several countries on the continent will suffer disproportionately from the effects of Climate Change, while contributing only 5% to global greenhouse gas emissions.

Certainly, the dynamism of the populations (youth being a determining factor) in the face of natural (droughts, floods), Sanitary (Cholera, Ebola, Covid-19), or human (wars and socio-political crises) disasters is evident. Jérôme Chenal (urban planner and researcher, director of CEAT and of Excellence in Africa, Ecole Polytechnique Fédérale de Lausanne Switzerland) demonstrates this

by comparing the reaction of African cities to European ones which faced with a superposition of Crises are quickly exhausted, while those of the South are showing a lot of courage by adapting quickly with or without a centralized or concerted organization... This does not however reassure in the absence of statistics and scientific models of the capacity of these future cosmopolitan hyper-megalopolises to move from resilience in underdevelopment to sustainability. There is an urgent need to develop and use smart tools, so that opportunities can be seized and capitalized in a holistic and democratic way.

*“ Despite the dynamism of the populations, and the lifeblood of youth, the absence of statistics and scientific models on the capacity of these future cosmopolitan hyper-megalopolises to move from resilience in underdevelopment to sustainability, introduced with an urgent need to develop and use smart tools, so that opportunities can be seized and capitalized in a holistic and democratic way. ”*

### “ Conceptualization at the service of urban policies...”

From an economic point of view, BIM was born from the desire to allow better management of resources, both physical and human. It is an adaptable method close to that of the circular economy that allows the management of the complete cycle, from production to the management of buildings and cities. By making a detailed digital model of current cities, we would have adjustable information on their potential.

An UN-Habitat report shows that between 2000 and 2010, 24 million people living in slums across Africa have seen their living conditions improve. However, this population share remains at 13% in the countries of the North and has only reduced by 5% in Sub-Saharan Africa. The main reason being the high cost of construction. By a comparison made by the World Bank in 2011, the m2 varies from \$ 173 in Morocco to more than \$ 865 in the Republic of Congo, and the price of cement, the main building material in Africa, being 183% more expensive in the continent than the world average. *«In many countries, only 5-10% of the population can afford the cheapest form of formal housing»* Ede Jorge Ijjasz Vasquez, former senior director of the social, urban, and rural development and resilience pole of the World Bank.



The introduction of BIM in the procedures for obtaining building permits, accompanied by a policy facilitating its adoption (facilities or favors to those who employ it in the act of building), will make it possible to harmonize locally, the area estimate of buildings and determine the quality-price ratio while developing a fair strategy for the acquisition and/or rental of Goods. On the other hand, thanks to substantial samples of digital models, an analysis of materials and materials would allow experts in sustainable housing to improve the ecological value of buildings, and to offer decentralized systems adapted to different climatic and social contexts, culture of the continent to move from improved models to reversible Net Zero versions in terms of GHG emissions.

At the same time, facilitating the involvement of banks, but even more so of the digital blockchain financial system, a direct asset at the service of the population which is increasingly adopting digital.

**“ BIM at the heart of autonomous / self-sufficient infrastructural strategies... ”**

As the architect Christian Benimana, director of Mass Design Group, noted, in a TED talk published in 2018, by 2050, to accommodate the 1.2 billion additional inhabitants, 2/3 of whom will be urban, living in megalopolises of more than 10 million inhabitants, it will be necessary to build 700,000,000 housing units; 310,000 schools, 85,000 health centers. This means, he continues, that from now on, for the next 35 years, every day we need to build 7 health centers, 25 schools, and 60,000 housing units. This implies an approach breaking with the model of developing countries, and adapting to the specific indicators of the continent.

We can note approaches such as those of CPDI Africa (Nigeria), which promotes a return to artistic identity and ethnology, of Foubman Art Room (Cameroon) with a cosmographic approach as a lever on which to rely to boost the return to green, or even Chorus Architecture with the ASA (African Sustainable Architecture) initiative which believes that by associating endogenous know-how and artificial intelligence, the local model will allow the built environment sector to move into the universe of the blue economy.

This also requires the analysis of proven methods such as those of kunlé Adeyemi, Diébédo Francis Kéré, Mariam Kamara ... to which one could not assign a scale factor without a Dynamic Virtual Analysis tool.

The intelligent virtual model can thus help to navigate from the scale of urban furniture, intermodal traffic amenities to that of buildings (social infrastructure) and agglomerations to anchor low-cost, smart and environmental innovations.

**“ Digital and the combination of opportunities...”**

Thanks to AI (artificial intelligence) and coding, a large number of simulation software makes it possible for upstream and downstream to assess the effectiveness of architectural choices. And, when we know that energy consumption is responsible for 64 to 74% of the region's CO2 emissions according to the IPCC, the combination in a BIM platform of these analysis tools used to study the many functions of green cities, such as reducing carbon emissions would help promote the sustainability of cities and link social policies to economic initiatives. This by employing software know-how to maximize the impact of responses found by professionals at various scales.

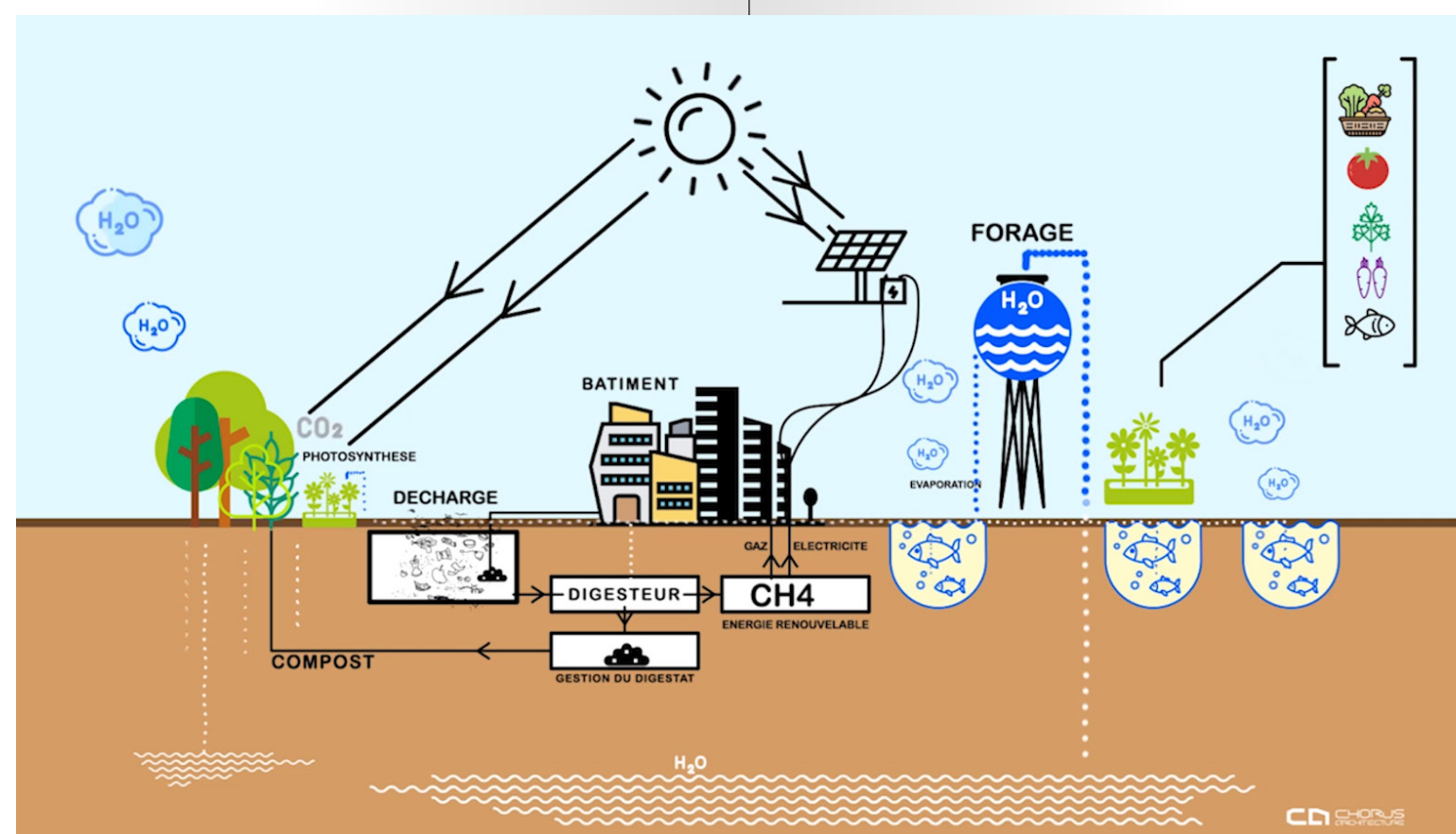


nle-kunle-adeyemi-the-makoko-floating-school

**“ From land 2.0 to sustainable land...”**

Another challenge is that of land management. According to The Economist magazine, only 10% of African land is registered and marketable. In its conditions which have further catalyzed by the predominance of the informal economy, urban sprawl is inevitable. The viability by means of a virtual model which is faster and easier to implement, would serve the cause of the policies which, without a muzzle, would consider supervising the efforts of the populations. At the same time, a simulated organization of spaces, facilitates all acts of land acquisition and management, giving more freedom of action to GICs (common interest grouping) or cooperatives in achieving their property objectives without conflicting with the overall vision of governments or major inter-country development regions.

This fundamental tool for controlling or limiting the expansion of cities can also help make the outskirts live better, by integrating part of their role in the city, like agriculture and animal husbandry in urban areas.



Habitat Autonome, projet FBI, source, Chorus Architecture, 2019



Controlling areas, whether built or not, can be a lever for maximizing the potential of open spaces by creating autonomy. Finally, introduce the benefits of AI with technologies such as drones and smart signage to manage disputes and cohabitation.

## “ Transition to sustainable resilience... ”

Currently, the transitions introduced by Covid-19 in our lifestyles by projecting into the profound changes in the Western world can facilitate the mutation and the change of role of buildings ...! The plethora of buildings assigned to the administration / civil service in several countries through spatial mapping and virtual materialization of floors and structures can be transformed to accommodate other services while these forms of work fall within the scope of lodging. Cyclical management of spaces in a multifunctional way can also be managed in this way. This creates a new service offering and different forms of employment. In a city like Yaoundé, mobility is highly dependent on the flow of government workers who migrate every morning from the outskirts to the center, and vice versa in the evenings, causing traffic jams to slow down the deployment of transport linked to economic activity. We realize that there is something to be done with digital technology: Well thought out, circulatory flows can be restructured in cities without external investment in infrastructure. An assignment in the periphery of a one-off meeting area, and the use of digital work technology to reduce movements to the center would reduce the need for road surface from size to quality, improving the quality of neighborhoods as well as their potential. Socio-economic...!

Knowing that all the streets are invaded by informal businesses, their potential in terms of wealth creation can evolve, and by being careful not to accentuate sedentarization due to home working, public transport and multiplication means of soft mobility (pedestrian traffic, eco-friendly cycle paths, canoes or other means independent of the use of fossil fuels) according to the geographical nature of the cities are possible.

This is valid for sectors such as sanitation and health, and the organization of health districts would gain in mastery if digitization from the acquisition of land, the installation of housing is known and allows a response commensurate with the challenges.

As we can see when we go through the expert analyzes around the issue of African cities, to correct the urban situation, there are three priority pillars:

- The development of infrastructure, as a basis for economic growth.
- The development of basic services (health, education, sanitation, transport, access to water and electricity, security)
- Assistance to disadvantaged populations for access to basic services, in particular housing, and finally mastery of urban planning.

The African particularity being resilience and informal dynamism, with the handling of daily difficulties by the populations in a favorable government context or not, BIM, a tool for holistic control of the urban environment through the dynamic virtual development of possibilities can offer the government a means, a democratic platform to make users sit down, and to think together with a minimum of expense the future of cities. At that time, after presenting the existing, democratic projections with the support of professionals at all stages and scales will be facilitated and recognized. In addition, associated with a local digital catalog of good practice, self-construction will reduce, and the models will be manageable. A fourth pillar would therefore be the adoption of digital technology, and therefore of BIM.



## “ BIM news in Africa... ”

According to the AFRICA BIM 2020 report, although known, the tool is used very little on the continent: out of 90% of respondents who have heard of BIM, around 70% strongly agree that the adoption of the BIM on the African continent is slow. 45% have adopted it for projects in their organizations. Of those respondents who mentioned that BIM has been adopted within their organizations, only around 30% have had a full implementation, while around 21% and 12% of companies respectively have partially or fully outsourced the method. A majority (over 70%) of respondents strongly agree that using BIM saves operating and maintenance costs. Only 16% and 23% of respondents currently use BIM in all or most of their projects, respectively.

To speed up the process, one of the challenges lies in the promotion and application of BIM in sustainable development. This is why BIM Africa, a pan-African community of construction professionals, has a responsibility to create awareness, raise awareness and regulate the adoption of BIM across Africa. This is done through the organization of BIM Africa Summits, BIM Conferences, Annual BIM Conferences, a Student Advocacy Program, an Ambassador Program, and many other activities, or through partnerships with companies, schools, governmental or non-governmental organizations working on the issue, notably with the promotion of Archi-TALK, an annual international conference, or BIM in Africa is now one of the subjects.

A sustainable city is one designed to address social, environmental, and economic impact through urban planning and resilient management. Many sustainable initiatives are carried out by integrating ecological alternatives into the city's infrastructure. Regulations and fines can also bring changes (some waste removal orders have been shown to be effective in reducing waste going to landfills). BIM, as a facilitator of sustainable design, takes into account and maintains the balance between ecological, economic, and social indicators. Typically, with BIM technology, an accurate virtual model of a building or city is constructed digitally. When completed, the conjugation-generated, organic, or programmed model contains precise geometry and relevant data needed to support city implementation activities. BIM also integrates many of the functions necessary to model the life cycle of a city, providing the basis for new building capacities and changes in the roles and relationships of actors, built artifacts as well as management policy.

Man as an extra-somatic entity has always punctuated his passage with visible artifacts, an insatiable builder since the discovery of plant reproduction, he has never ceased to accentuate his sedentarization by adapting his habitat to the mastery of the material availability which surrounds it and of the collective organization which frames the common life around economic and cultural benefit... Only, it comes up against each time with the dictatorship of the scale, but also with the reality of nature. He learned it from agriculture, he should now refer to it to assess the viability of his interventions. The City is the most significant assertion in the development of community life. It will reach its peak in this 21st century in its current form. Events such as Covid-19 sufficiently demonstrate that it is outdated. It must be reinvented or separated from it, but whatever the formula it should be used as new scales of intelligence. Those that can involve as much information as possible. It is about using BIM or in general AI.

We insist on the need to take into account the unique African peculiarities and to take advantage of the opportunity that the new tools give us to avoid making the errors perceived elsewhere, and to use information modeling to influence habits and promote good practices. whatever the level of decision-making.



# PEOPLE-CENTERED ARCHITECTURE

Innovation at the service of community projects in Africa .....	78
Rural lessons for the city of the future: An architect's perspective .....	84



Practical Training College Sangha, students bringing stones for garden walls, 2019, Photo by LEVS architecten





## “ Empower local communities...” ”

To illustrate the impact of the innovative architecture has on local women communities, the “Women's Opportunity Centre” was designed by Sharon Davis Design, located in Katonza, Rwanda to empower one small community of women that dedicate their days to small subsistence farms, fetching freshwater, and scavenging wood for fuel. In the architect's words, the design “revives a lost Rwandan design tradition with deep spatial and social layers. Its circular forms radiate outward, from intimate classrooms at the center of the site to a community space, farmer's market, and the civic realm beyond. The center's circular structures are modeled after the historic King's Palace in southern Rwanda, whose woven-reed dwellings were part of an indigenous tradition that the region had all but lost.

The design draws on the delicacy of this vernacular Rwandan construction method with rounded, perforated brick walls that allow for passive cooling and solar shading, while maintaining a sense of privacy. Architects, in partnership with local companies, have been able to create water purification, biogas, and other sustainable systems that can be produced and maintained by the locals themselves.

Women's Opportunity Center\_farm 2013, Photo by Elizabeth Felicella



Women's Opportunity Center\_administration\_buildings 2013  
Photo by Elizabeth Felicella

## INNOVATION AT THE SERVICE OF COMMUNITY PROJECTS IN AFRICA

The African continent is human to the human race and civilization, a civilization reflected in its ancient architecture. From the Pyramids in Egypt to the Nubian pyramids at Meroe to The ruin of the temple at Yeha, Ethiopia. Architecture has served African societies in multiple ways throughout history. In recent years, Africa is well known and depicted mainly on the humanitarian side by the mainstream media, blurring the rich architectural heritage the continent has brought to the world. However; the continent is home to breathtaking sustainable designs. The uniqueness of some buildings currently designed in Africa by various local as well as foreign architects, is the sustainable aspect of the building and the impact they have on local communities.





## “ Education for everyone... ”

The innovative architecture has not left behind the importance of education. On education, Nelson Mandela could say “Education is the most powerful weapon which you can use to change the world”. The parallel between what Mandela said and the poverty of many communities in Africa brings about crucial questions, such as how can architecture truly modify places and give children schools better conditions? Is it possible to give an architectural answer to very poor societies around the African Continent? Architects need to think about using architecture as a tool, even in places that lack money and building technologies, and Diébédo Francis Kéré is doing exactly that in Africa. In his home country, Burkina Faso, Diébédo Francis Kéré designed a primary school in Gando, in 2001, with a design reflecting an architectural style that combines traditional building techniques with modern engineering methods.

The design for the Primary School has developed from a lengthy list of parameters including cost, climate, resource availability, and construction feasibility. In order to maximize results with the minimal resources available, a clay/mud hybrid construction was primarily used.

These traditional clay-building techniques were modified and modernized in order to create a more structurally robust construction in the form of bricks. The clay bricks have the added advantage of being cheap, easy to produce, and also provide thermal protection against the hot climate. The roof of the Primary School has been pulled away from the learning space of the interior though, and a perforated clay ceiling with ample ventilation was introduced. This dry-stacked brick ceiling allows for maximum ventilation, pulling cool air in from the interior windows and releasing hot air out through the perforated ceiling. In turn, the ecological footprint of the school is vastly reduced by alleviating the need for air-conditioning.

The contribution of the entire community to build the school has been a step in the future with more possibilities, both for those who now have a decent building in which to learn (the school) and for those who now know how to build this building.



Primary School in Gando\_perspective 2001, Photo by Siméon Duchoud



HIKMA - A Religious and Secular Complex Facade 2018, Photo by James Wang

## “ Architecture for culture and religion... ”

One of the well-known aspects of Africa is its religious diversity. Religious facilities can be used for more than spiritual purposes, but rather to pursue knowledge alongside religious practice. One living example is the HIKMA, religious and secular complex. Designed by atelier Masomi + studio Chahar, the building complex is located Masomi in Dandaji, a village in the arid Western Niger with a young population of around 3000.

The project is a culture and education hub where the secular and religious peacefully coexist to cultivate minds and strengthen the community. The new library provides books, a computer lab, and quiet study spaces to improve reading and vocabulary skills for the community and to increase graduation rates of a population with low literacy rates and high economic vulnerability.

By involving women groups in the project, additional spaces for literacy, accounting courses, and workshops have been added. The new mosque engages women and the youth positively in addition to other spaces, as productive members of the community.



HIKMA - A Religious and Secular Complex Library 2018, Photo by James Wang



The project introduces Compressed Earth Bricks (CEB) made with laterite soil found on-site; a new material in the area with the advantage of being lower maintenance than adobe, with similar thermal benefits. Most of the project materials are sourced from less than a 5km radius distance to the site, while the use of concrete is limited to structural elements such as columns and lintels. The thermal mass of the CEBs and natural ventilation keep indoor temperatures comfortable and remove the need for mechanical cooling. The effect is amplified with extensive planting throughout the site, using a drip irrigation system to help the vegetation thrive. The system dramatically lowers water consumption and will use an underground water reservoir that captures the rainy season's downpours.



HIKMA - A Religious and Secular Complex Library prayer buildings exterior 2018, Photo by James Wangjpg



Children's Surgical Hospital\_Facade\_2021, photo by EMERGENCY

## “ Architecture for health... ”

Women's empowerment centers, better schools, culture, and education hubs, and many other facilities would have not served a sick and unhealthy society.

*“To be able to achieve the laudable goals (of preventing and treating HIV/AIDS), especially for us in sub-Saharan Africa, there is the need for us to invest in improving our weak health systems. The inadequate number of healthcare facilities in many of our countries is a major issue of concern.”* John Dramani Mahama.

To face the inadequate number of healthcare facilities, The Emergency NGO Children's Surgical Hospital was designed by TAMassociati with Renzo Piano Building Workshop for Pediatric Surgery, at Lake Victoria, 35 Kilometers from Kampala. The Hospital is built by using resources of the earth, water, and the sun. A strong sustainable approach in design choices: load-bearing walls with the rammed earth technique and a roof made from a suspended canopy structure supporting 3,700 square meters of photovoltaic panels.



Children's Surgical Hospital\_Facade\_2021, photo by EMERGENCY

Responding to the site's topographical curves towards a nearby lake, the scheme's walls and pathways form terraces on which the hospital itself stands. Stacked walls break the distinction between various zones to create a unity between the lake, park, and internal hospital environment, leading to “a spatial continuum between interior and exterior.” Born from the earth, the hospital gets its energy from the sun, with 9,800 square meters of photovoltaic panels ensuring the hospital has an autonomous electricity supply during the day. The photovoltaic roof “floats” above the building, also guaranteeing shade for the hospital and uncovered walkways.

Africa has not only brought to the world a rich architectural heritage, the innovative architecture being implemented on the continent continues to pursue solutions to provide a better service to local communities by inspiring itself from the cultural history of the continent through sustainable and vernacular ways to truly modify places and give people better-living conditions and also answer to poor societies, not only in Africa, but all around the world.



## “ Losses on both sides... ”

The intensity of urbanization in many West-African cities and the emptying out of rural communities has losses on both sides. On the one hand, there is the fast-paced overgrowth of anonymous residential areas on the outskirts of large cities, like Bamako, which results in underdeveloped informal settlements, lacking infrastructure, public services, and jobs. On the other, there are the rural towns and villages that see an entire generation leave, family-ties break and regional economic decline accelerates. The potential benefits of city life and the opportunities of rural life disappear.

This requires investments in infrastructure and education in both cities and rural areas. From the perspective of an architecture office that has worked in Mali and its neighboring countries for over 25 years, we have drawn several lessons on how to make these investments fruitful.



Practical Training College Sangha, construction of the second cluster, 2018, Photo by LEVS architecten

## RURAL LESSONS FOR THE CITY OF THE FUTURE AN ARCHITECT'S PERSPECTIVE

The UN estimate that the urban population of sub-Saharan Africa will rise from the current 40% to 60% of its total population by 2050. Accordingly, there is considerable attention for the challenges this poses to urban quality of life, especially in West Africa, where the fastest growth is expected. Yet, these analyses often overlook the rural context in two important ways. Firstly, by underestimating the opportunities for the remaining 40% of the population that is expected to stay there. Secondly, by disregarding the characteristics of rural communities, their organization, and architecture, in planning and designing urban expansion. It is a missed opportunity: combining the rural and the urban can bring out the best of both worlds and create not only more liveable modern cities but also rural communities that are attractive for future generations.



Practical Training College Sangha, masterplan, 2013, LEVS architecten



## “ The 40%: Sangha, Mali... ”

In 2013, the Malian NGO Association Dogon Initiatives (ADI) and its Dutch counterpart Partners Pays-Dogon (PPD) commissioned LEVS for a school building in the small town of Sangha, in central Mali: a Practical Training College for technicians and engineers. Rather than a stand-alone building, the goal was to create a lively living center for the transformation of regional economic activities and a dynamic hub for youth.

The college will facilitate the training of up to 900 students. A key element of the plan was the involvement of local stakeholders. They pointed out that themes as desert ecology, nutrition, the use of water, irrigation, farming innovation, beekeeping, and solar energy all are at the forefront of many of the challenges faced by residents of Sangha and beyond. And by creating concrete opportunities for students in the region, they will not immediately head off for the capital, Bamako.

The layout of Sangha follows natural elements in the landscape: houses are built on top of the rocky hills that come together like interlocking fingertips. The land in between is freed for agriculture. Our design for the practical college combines the fingertip-layout of the wider Sangha area with the benefits of fertile soils that are needed for various educational programs. By creating several small clusters of buildings within a walled plot of six hectares, the college terrain effectively becomes a new neighborhood at the edge of town.

The small clusters contain fifteen classrooms, four hangar-workshops, ten teacher-residences, and technical service buildings. Each cluster takes its inspiration from the traditional organisation of the Dogon family house. The house of the main family, those of the extended family, and the family granaries surround a central court and are connected by stone walls. In our design, these clusters in turn are surrounded by gardens with Moringa trees and green plateaus that level-out height differences in the terrain. Paths lead along the buildings, past the gardens and the water wells that are located on the periphery of the plot. By considering the conditions of the local build environment in this way, the design manages to innovate within the bounds of a UNESCO world heritage site.

Currently, even the construction of several of the school buildings itself was executed by a first cohort of graduating students. All to secure regional attention for studying and working in Sangha.



## “ The 60%: Sélibaby, Mauritania... ”

One of the main problems with urban expansion is that developers are often solely focussed on building houses, and nothing but houses. What can they learn from rural communities?

Some years ago, LEVS was commissioned by the Mauritanian Ministry of Habitat to propose an urban plan and architectural design for the first 250 houses to be realized as part of the 'New Sélibaby'. Based on our experience in rural Mali, we wondered: how can we integrate local traditions in a contemporary design instead of following only the standard technocratic design requirements?

To that end, we tried to shift the attention from the often-imposed grid system. By inserting public and semi-public spaces of different sizes and privacy levels, we aim to inspire people to form a livable community. This is achieved primarily through planning of public functions such as squares, parks, markets, mosques or schools.

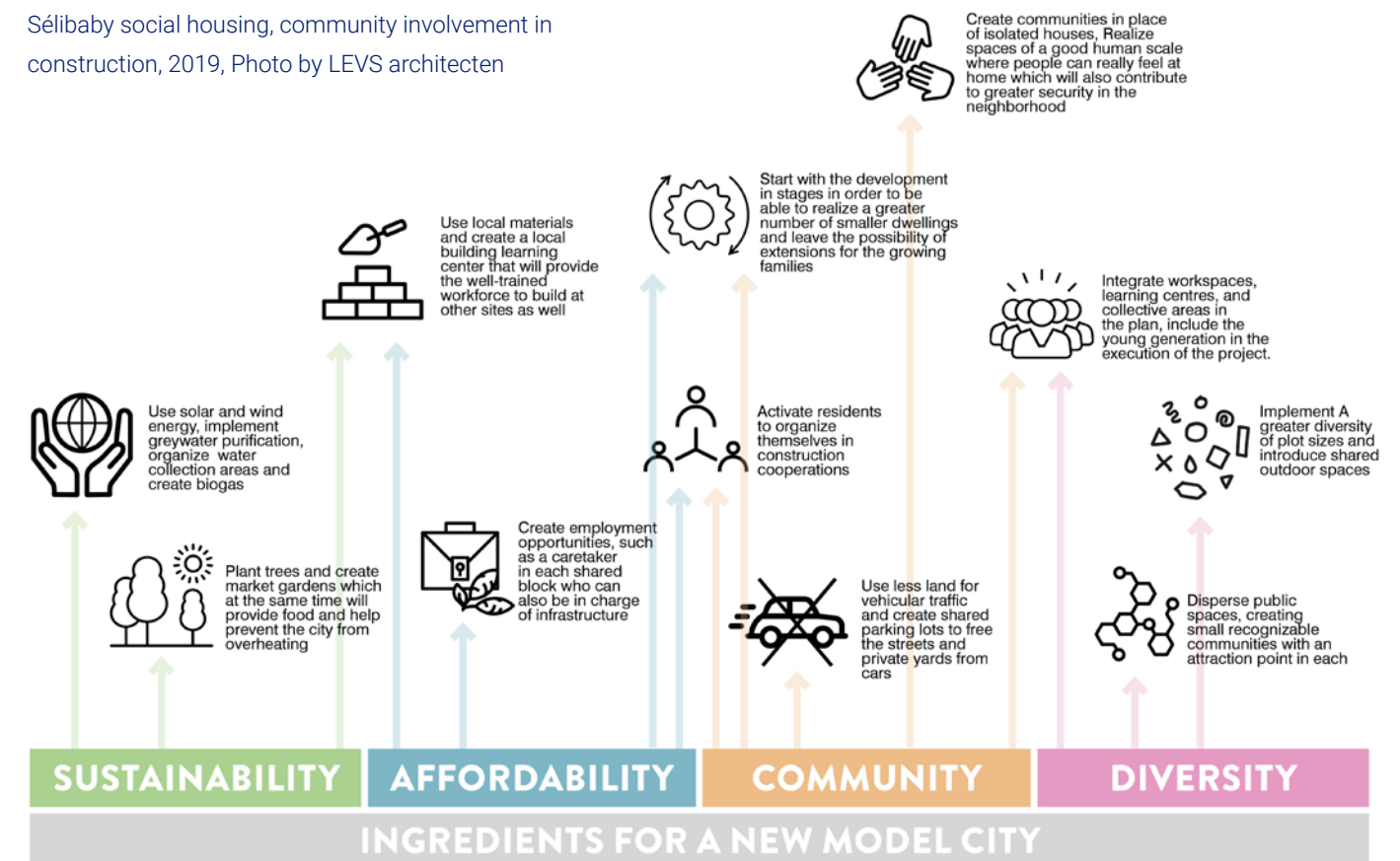
The typical wide and space-consuming streets are replaced by more traditional and shaded narrow streets and collective green gardens. Broken viewpoints create a sense of human scale, inviting the inhabitants to activate the public spaces.

The plots are grouped into housing blocks, each of which will have a shared vegetable garden. The stand-alone kitchens alongside the street and low property walls invite for social interaction. Grey water purification system from bathrooms will provide enough water for the gardens at no extra cost. Ecological toilets are built and the next step is to introduce a completely off-grid system with solar panels and an independent water source.

The sustainable houses are made of hydraulically compressed earth blocks which are produced on site of locally sourced clay. This natural material is suitable for making comfortable interiors in hot climates. The houses are built by local people, who have been trained beforehand. Students from the local technical school, women from the village, employers from a local contractor, soldiers from the government: together they work on the future of New Sélibaby.

In a recent project proposal for social housing near Dakar, we took the ideas from Sélibaby a step further.

Sélibaby social housing, community involvement in construction, 2019, Photo by LEVS architecten



Strategy for a new model city, 2020, Illustration by LEVS architecten



Here, different housing typologies for different users, each with an incremental approach, offer the opportunity for house extensions as families grow. It allows, for example, multi-storey housing blocks. Additionally, we minimized the sizes of plots, and compensated the apparent loss of square meters with shared gardens and parking spaces.



Housing in Dakar, axonometric view of a neighbourhood segment, 2020, Photo by LEVS architecten

## “ A symbiosis of cities, town and villages...” ”

What is lost in this process of rapid urbanization is a sense of local community and economy, in cities, towns and villages alike. As architects and planners we see opportunities in all these places to build environments that need not cost more, yet are productive of the kind of quality of life that people seek.

In the city, this means creating an urban fabric that takes its organizational principles from local culture and respects living traditions as well as climate challenges: go beyond the rational plot, create shared public spaces and introduce off-grid energy systems and sites of food production so that a neighbourhood can become a self-sustaining living environment, not just an externalized temporary residence. At the same time, one should give rural areas the credit they deserve as main sources of food security and as spaces that diminish the pressure on the ecosystem often created by urban expansion and lifestyle. Helping villages to thrive by creating more opportunities for their inhabitants will unburden urban migration. This process is most successful when developed and designed hand-in-hand with the end users, who understand what needs a specific region has, ensuring the viability of the built environment.

One final important development not otherwise discussed here, is the availability of internet and digital communication in rural areas. The corona pandemic taught us that even though travel was restricted, we were able to continue most of our work. This means that in the near future, younger generations seeking new economic opportunity, need not necessarily leave for the city, when communication is online.

In a healthy symbiosis, urbanization should benefit rural population, as much as rural development should support the functioning of cities. We believe it is possible.





their environment, through an adequate treatment of waste and the use of local and bio sourced materials. The long-term objective is to create a network of small collective facilities of varying capacities, adaptable to specific needs and covering the entire territory.

Initially, specifications were drawn up combining environmental, economic and social requirements and several modular and scalable solutions based on MPC technology were developed.

*"The Confined Stone Wall (CPW) technique is a technology developed by A&D since 2010. The MPC adapts the gabion technique to the habitat and allows the construction of small structures, such as dwellings and small collective equipments, safe, durable and affordable, suitable for assisted self-construction. This resilient technology can be adapted to fragile development contexts for precarious populations or those suffering from geographic or technological isolation."*

A social and technical diagnosis of a pre-selected group of households in each of the 11 rural districts, representing more than a hundred households in total, made it possible to adapt different technical solutions in collaboration with the inhabitants and the commune's technical department, which then selected 6 groups of beneficiary households, thus making it possible to build equipment variants.

Eco hammams, Photo by A&D

## ECO HAMMAMS; SMALL SELF-MANAGED SHARED BATHS

Within the framework of policies to improve living conditions for its rural populations, the municipality of Oulmes in Morocco called upon Architecture & Development (A&D) to design a project to improve hygiene conditions for precarious rural populations. A&D, which has been developing sustainable solutions to improve the built environment throughout the world for over 20 years, proposed a pilot project of small self-built collective facilities, implemented with its local partner A&D Morocco.

Inspired by the tradition of the collective bath/hammam, the pilot project aims to design collective sanitary facilities, shared by several families in the same area, adapted to their habits and needs. Efficient and economical in water and wood resources, affordable in their operation and construction but also respectful of



The equipment was built in a training site with workers living near each site and often also beneficiaries. Led by A&D Morocco, the objective is also to train a first core of craftsmen on which a deployment phase can be based. These training sites enrich the technical knowledge of the various local professionals, training them in MPC technology and the implementation of other local materials (cork, lime, straw, etc.) and construction systems (improved fireplace, vault, planted filter, etc.)

In the pilot phase, four facilities, 3 collective solutions and 1 individual, were built in 3 hamlets prefiguring different contexts and configurations. If the partners are convinced of the relevance of a collective and shared bathing model, the diversity of the contexts also led to the demonstration of an individual solution adapted to very specific contexts of great isolation or disability making sharing impossible. Composed of a single room of 5m2 with a toilet and a shower, this «bathroom» equipment respecting the PMR norms was realized in the hamlet of Ait Ben Azouz.

View on the finished wet room, Photo by A&D



Out of the 3 collective equipments, 2 have been realized with WC. The proposal C (checkroom + wet room + WC) which is located in Ait Ben Azouz and Ait Lehaj Sder, respectively for 7 households (39 inhabitants), and 9 households (50 people), and the proposal A (checkroom + wet room) realized in Ait Atta for 13 households (64 people).

The useful surface of each equipment is 10 to 12m<sup>2</sup>, including 6m<sup>2</sup> for the wet room and 4 m<sup>2</sup> for the changing room. The bath meets the needs of 7 to 13 households with a maximum capacity of 4 adults and 2 children per bathing session (2h max) for a weekly use and operation spread over 2 to 3 days per week.

The shared facilities are designed with an insulated cork box in a built envelope with MPC walls and a lime and straw vault, all protected by a lime and sand coating.

Each collective equipment is equipped with a 500L buffer tank that can be filled from the public water network, a well or a cistern. The equipment in Ait Lehaj Sder is supplied with water from a nearby well and a submersible pump, while in Ait Ben Azouz, the equipment is connected to the public water network.

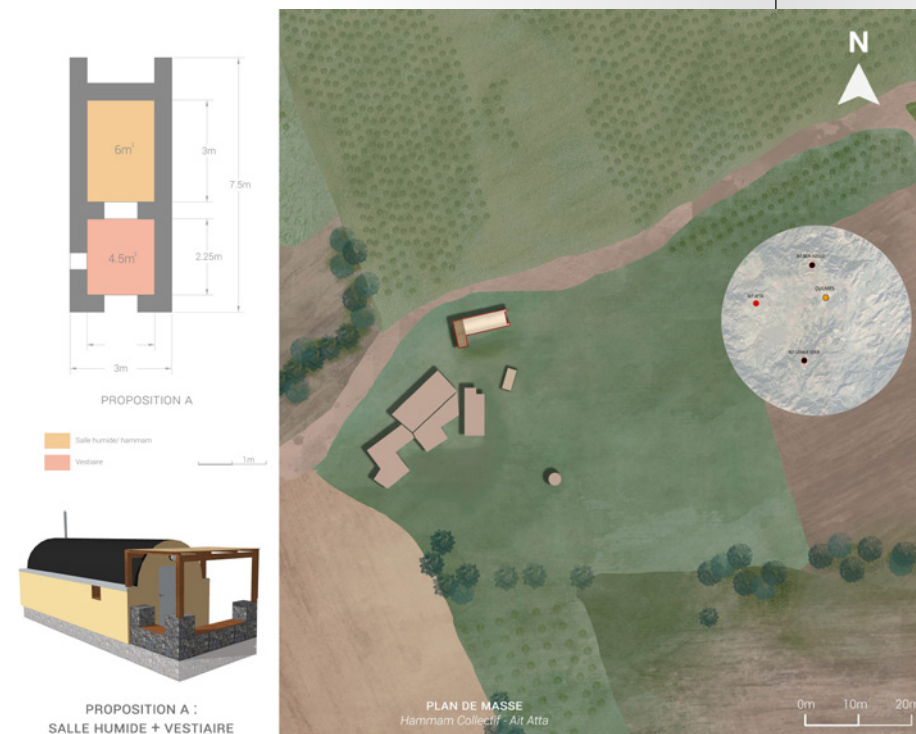
Grey water and black water are separated according to the configuration of the different equipment. The black water from the toilets is treated by a septic tank and a lost well, while the grey water from the bath is treated by a planted filter and lost well, preceded by a screen.

The heating system used is efficient and optimizes the combustion of wood in the fireplace and the recovery of the heat from the smoke before it is rejected outside. This heat creates a radiant accumulator in the bath and also heats the hot water tank. Operating with wood or biomass fuel, the system allows a 12-hour operation at 40°C with a consumption of about 40 kg per day and a time of 2 to 2.5 hours for the temperature rise.

In addition to the presentation and information sessions on the equipment given to the beneficiaries and the commune, user and maintenance manuals have been designed to accompany the households in their use of the equipment and to facilitate their management and maintenance. These manuals cover the procedures for starting and stopping the bath, the typical use of the equipment and its weekly and annual maintenance. Information panels installed in the bath also remind these principles.



Exterior design in MPC, Photo by A&D



Application of straw earth layer, Photo by A&D

Finally, in order to support the deployment of the shared equipment in the next phase, an architectural and technical booklet of each equipment was realized gathering the plans, the quantities of materials and the manpower requirements allowing the reproduction of each bath.

In addition, a programming aid document was provided to the municipality to program and size this second phase of the equipment. This document offers a global vision of the process of realization of improvement solutions, by posing all the stages of design and realization, and by estimating the time and costs necessary.

The options realized in the pilot phase are presented with their advantages and disadvantages in order to make relevant and well informed decisions for the next phase.



Application of sand lime coatings, Photo by A&D



# INNOVATIVE ARCHITECTURE PROJECTS

Startup Lions Campus	96
High School Jean Mermoz	100

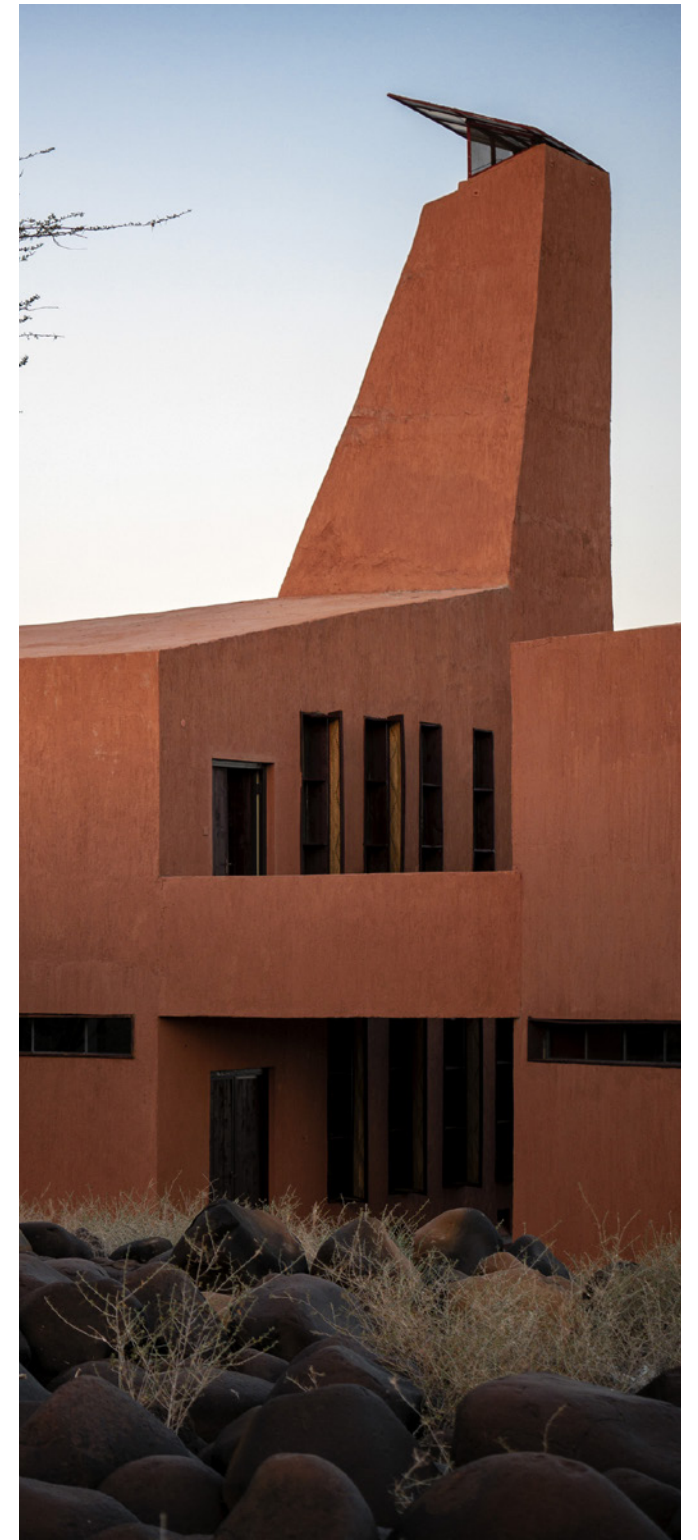


High School Jean Mermoz, Photos by Daniel Rousselot, TERRENEUVE





The project was designed on an area of 1 416m<sup>2</sup>. Completed in 2021, the project responds to the urgent challenge of youth in the face of unemployment facing the region, as it offers high-level training and access to international jobs, allowing young entrepreneurs to prosper professionally without having to leave their place of origin. The campus will provide 100 new workstations and is the first step in an ambitious spread of ICT networks in remote areas.



Startup lion campus bird 2021, Photo by kere\_architecture

## STARTUP LIONS CAMPUS

Located in Kenya and home to the Lake Turkana, the country's largest landlocked body of water and the biggest desert lake in the world, Turkana county is well-known to be a large expanse of beauty yet arid land with low bushes and occasional trees. Termite mounds, buzzing with activity and up to several metres high, are dotted around the region's gently undulating landscape. These structures built by termites are what captivated and inspired Francis Kéré, the Berlin-based architect born in Burkina Faso, when I was researching the area of a sustainable education campus on the lake's banks.



During the Global Africa Forum organised by the Munich Technical University in 2019, Francis Kéré met Ludwig Bayern, founder and CEO of Learning Lions, a non-profit organisation that works to empower young adults in impoverished rural areas of Eastern Africa. The pair then decided to build a higher education facility by Lake Turkana, that would offer valuable IT knowledge to the country's youth.

Start-up Lions Campus is an information and communication technology (ICT) centre, located on the shores of Lake Turkana, Kenya.

Startup lion campus\_ xterior view 2021, Photo by kere\_architecture



The project celebrates the unique morphology and natural beauty of its site. It is built on two levels, which follow the natural slope and have spacious roof terraces that offer panoramic views over the Lake Turkana. The roof terraces are shaded by creeping vegetation, providing a pleasant exterior and gathering spaces where opportunities for informal exchange of ideas are provided.

The campus is built out of locally sourced quarry stone with a plaster finish. In choosing which materials and construction techniques to use, ecological sustainability, cost, and availability factors were weighed to arrive at the best compromise. Collaboration with the local community was key in this decision-making process, drawing from their experience and expertise. The building is inspired by the towering mounds built by termite colonies in the region. Ventilation towers create a stack effect to naturally cool main workspaces by drawing heat upwards, while cool air is drawn in through specially designed low-level vents.

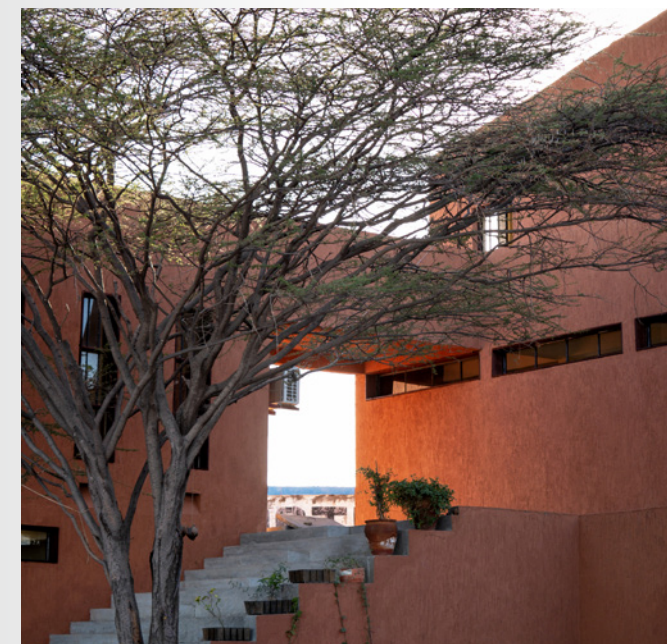
This system allows the campus to withstand high temperatures and is especially suitable, since it avoids dust that can damage the equipment. In addition to their functional role, the towers create a landmark in the surroundings. The campus is built from locally sourced quarry stone with a plaster finish. Materials were carefully chosen, and construction techniques could be used, and levels of ecological sustainability, cost factors and availability were weighed. Collaboration with the local community was key in this decision-making process.



Startup lion campus interior view, 2021, Photo by kere\_architecture



Startup lion campus exterior view, 2021, Photo by kere\_architecture



Startup lion campus exterior view, 2021, Photo by kere\_architecture



techniques and imported products, project sought a territorial anchoring and environmental, but also exemplary economic and social. He has also wanted to demonstrate that he could exist an alternative to production Dakar real estate, which transposes most often an architecture international largely disconnected from the Senegalese context.



## HIGH SCHOOL JEAN MERMOZ

The High school Jean Mermoz in Dakar was designed by Terreneuve Architectes and built in 2011 in Dakar, in the neighborhood of Ouakam.

The project was nominated for the «Aga Khan Award for Architecture» 2013 and won the Grand Prix AFEX 2012. The project's program includes new construction on what are presently the sports grounds of an existing school complex. It regroups the preschool, elementary, middle and high schools for an eventual total of 2,500 students.



High School Jean Mermoz, Photos by Daniel Rousselot, TERRENEUVE

As the client had a limited budget for the project, 15,7 M€ of works for 17,000 m<sup>2</sup>, and 40,000 m<sup>2</sup> of grounds works, they sought an architectural approach using construction economics and policies based on sustainable development principles. The idea behind the project is part of a new political context, where the restriction of budgets forced to think differently.

The strong program constraint was a lever for the challenges of sustainable development of the project. By leveraging resources and local know-how to limit



High School Jean Mermoz, Photos by Daniel Rousselot, TERRENEUVE



Building with very limited technical means and based on the know-how of local construction companies while minimizing the use of imported products; to implement on an urban scale a variety of architectural solutions to regulate the interior and exterior climate passively and to reduce the impact of the buildings on the surrounding neighborhood by treating the waste on-site; based primarily on technical considerations, the project for the Jean Mermoz High School aspired an original and contemporary architectural vocabulary, setting itself apart from the imported models that often characterize the image of African cities. The organization of the main buildings in tightly spaced parallels, with the enclosed spaces forming planted and shaded courtyards, stimulates natural and transversal ventilation. The construction typology of each entity contains multiple passive solutions for cooling and solar protection: exterior galleries serving the interior spaces, double and ventilated walls, brise-soleil, roofs with a high thermal inertia. The total of these measures assures a thermal comfort during the most of the scholar year, reducing the necessity of air-conditioning to only one or two months a year. The treatment of waste and rain water, the volumetric principles and the careful choice of the different colors of the project, all determine an architecture as well as a landscape that is firmly rooted in the red earth of Dakar.



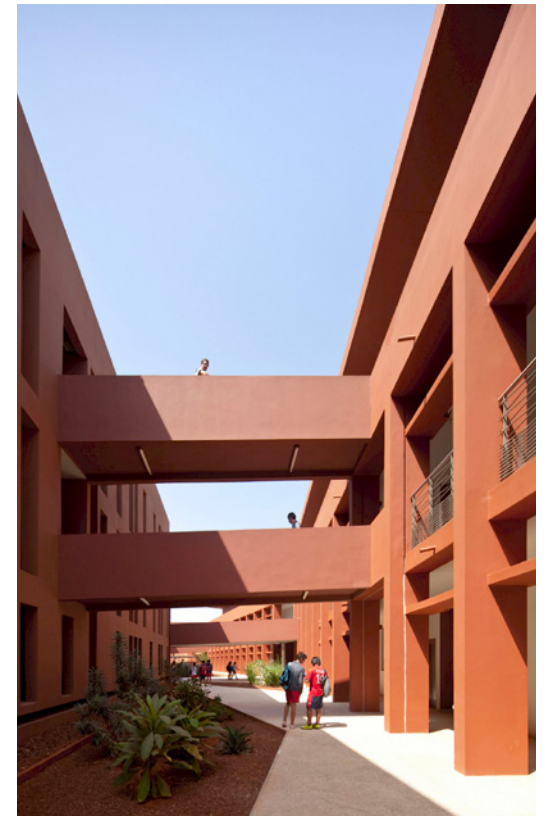
High School Jean Mermoz, Photos by Daniel Rousselot, TERRENEUVE



High School Jean Mermoz, Photos by Daniel Rousselot, TERRENEUVE



High School Jean Mermoz, Photos by Daniel Rousselot, TERRENEUVE





# **INTERVIEW WITH HAYATTE NDIAYE, PRESIDENT OF THE NATIONAL ORDER OF ARCHITECTS OF CHAD**





“ I am Hayatte Ndiaye, pioneer architect and president of the National Order of Architects of Chad... ”

My journey began in Chad where I did my primary and part of my secondary education before moving to France where I obtained a scientific baccalaureate. I then joined the Institut Supérieur d'Architecture Victor Horta / Université Libre de Bruxelles, for a course in architecture: design and realization of buildings. Upon graduation, I began my professional career in France with the Parisian firm «Architecture Studio» where I worked for a year before returning to Chad in 2009, which was then in the middle of a construction boom thanks to the oil windfall.

Back in N'Djaména, I collaborated with the Cabinet Atepa on two major public works from 2009 to 2011, before setting up the Hayatt Architecture firm. Under the seal of responsible architecture, the firm defends an unconventional architecture, respectful of the environment, which pays particular attention to the energy performance of the building. The social dimension and the impact that architecture can have on the daily life of people have always been at the center of my concerns.

Member of the international jury of the African School of Architecture and Urbanism (EAMAU) graduation, I also intervene in various conferences, including the West African Festival of Architecture (WAAF). Member of the international jury TERRA AWARD SAHEL and the Forum of Earthen Construction Actors (FACT Sahel), I will be at the origin of the international conference «Sustainable Habitat in the Sahel», the first edition of which will be held in April 2018 in N'Djaména.

In July 2019, I was elected president of the National Order of Architects of Chad (ONAT), and in November of the same year, we organized in N'Djaména the very first round table of architecture on the future of African cities, with the theme «African cities of the future», which brought together many actors in the world of construction, including about fifteen presidents of continental and international orders.

Under the aegis of the National Assembly, I will preside in March 2021, the jury of the architectural competition for the construction of the memorial stele of Bohoma, a locality on Lake Chad.



Hayatte Ndiaye

“ Urbanization should not be a matter of chance... ”

Urban development must be the result of a long-term vision, a conscious and concerted vision, accompanied by a substantial financing plan, likely to support its implementation. This regalian mission for the future of our cities and the image they project is the responsibility of our states, and should not be the result of a haphazard process, built according to the financial aid of international organizations or the specifications of intransigent donors. The urgency is therefore in the definition of this vision of the actors of the African city, of the present and the future of their living environment, and in the implementation of this urbanization plan through a transcendent leadership of our governors.

These visions must be guided by strategic tools, including territorial coherence plans for the harmonious development of our territories. To effectively mobilize financing, we must put in place mechanisms that promote the development of local economies, supporting industrialization, and creating jobs locally. It is unacceptable that after decades of independence we are still relying on international donations to finance development. The question of financing the urbanization of our cities is therefore crucial.

Most African cities develop in spontaneous concentric rings around a more or less planned central core. These unplanned new districts crystallize most of the governance problems that these cities face. It is therefore essential to question our modes of production of urban space, when we know that even our villages respond to well-defined principles and schemes in their development. For example, public squares occupy a central place in our villages and disappear in the orthogonality of our cities. Our way of making the city must take into consideration our culture, our identity, our uses by giving back to the village square its determining place in our cities. And because the African (sub-Saharan) man is by nature an outdoor man, particular care must be taken in the design and management of urban public spaces.

Our cities must reflect the people who live in them, they must be more inclusive and more sustainable. Imported models, designed outside, have shown their limits because they are unsuitable. They often lead to dehumanization with all the consequences that we know. Integrating the notion of identity and culture in the planning of our cities from the outset is the price of their resilience.



Satellite view of N'djaména, Photo source Google earth



“ **The sustainable city is above all a city thought locally by the inhabitants...** ”

We are in a context of globalization where African cities are under attack from multinational firms, selling concepts and turnkey products, without having had the time to learn or to experiment, which is the key to sustainable development. It is therefore clear that for us «the music is going a little too fast». If we consider that the notion of sustainability and its corollary, resilience, presuppose a mastery of the processes and techniques of creating and managing a city, the African city has every interest in defining and implementing its own score in this new voracious configuration of the world.

Our cities are developing more and more rapidly, with a construction market in constant evolution. However, most of the building materials, representing 50% to 70% of the total cost of construction, come from imports. This has the effect of making access to housing expensive, excluding vulnerable people with low incomes, who represent the largest segment of the

population. The advent of the sustainable city in Africa must therefore integrate financial policies that promote the development of local economies, have a holistic approach that integrates local expertise, and address the financial dimension in a sustainable manner.

This is why the sustainable city is above all a city thought locally by its inhabitants, a city that responds to local needs, otherwise it becomes useless. Paradoxically, historically, African cities were sustainable cities, because they were designed according to their environment, and the ways of life of our ancestral societies. Unfortunately, all these skills have been abandoned in the design of the modern city. The current African city is built on fortuitous foundations that do not work because they are disconnected from reality. An introspection, a diagnosis and a repositioning are therefore necessary to build the city of tomorrow.



Panorama of N'djamena, Photo by Dmitry Moiseenko, austria-forum.com



N'Djamena, Photo by Dzmitry Aleinik

“ **Strong political will is needed to design a more sustainable future for our cities...** ”

The construction of most of the world's major cities is based on political visions and the commitment of governments. Similarly, in Africa, our leaders must first of all take a more proactive approach to urban issues. It is therefore through a strong, deliberate and conscious political will and citizenry, and a long-term projection of our cities that we can significantly and sustainably improve our urban environment.

There is often an incompatibility between the problems we are experiencing and the answers that are given to them. It is more than urgent that our leaders become aware of the priority nature of the urban issue, as it has repercussions on the safety, health, well-being and economy of our cities. From this point on, we would gain by planning our cities with military rigor. The African city of tomorrow will therefore be the one we choose.

“ **Young urban planners and architects must think in an uninhibited way about the design of African cities...** ”

The mission of young urban planners and architects on the continent is to experiment with the local context, to study the history of our cities and civilizations, to question their social and cultural framework, etc. This should allow them to have a specific look and to propose innovative and contextualized approaches to the development of our cities. They have the responsibility to reappropriate their history and to propose models that best correspond to the needs of our populations.

David Adjaye and Francis Kéré, among others, are architects who should serve as an example for them because they have succeeded in breaking away from the classic and standardized approaches to architecture.

These architects have paved the way, it is up to the younger generation to follow in their footsteps by continuing this work of cultural reappropriation which is the basis of our identity.

The young generation of architects and urban planners must take on the new challenges facing our cities and countries, such as security, health and environmental issues with climate change, as well as digital and technological issues. Their greatest challenge will be to succeed in reconciling all these aspects so that we have cities that are pleasant to live in and that leave no one behind.





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### INTEGRATED DESIGN WITH BIM

Integrated design aims to bring together specialisms who were usually considered separately. The main objective of integrated building design is often to produce sustainable architecture. At Nandhaa we use Integrated design approach by leveraging collaborative methods and tools, mainly BIM, to enable architects, engineers and stakeholders to work together to produce smart and sustainable buildings. Familiarizing engineering consultants at the very beginning of the project creates opportunities for better design and we can create unique architectural features by having more time and more conversations about the vision and the goal of the project with structural engineers, mechanical and electrical engineers and the architectural team and involving engineering teams as early as schematics or space-planning stage.

    NANDHAA



# 04 AFRICAN ARCHITECTURE AND URBAN HERITAGE

Medinas: Historic green cities ..... 114

Influence of religion and beliefs in architecture ..... 120

Tallensi Traditional houses Ghana ..... 132

What if we reimagined ancient Africa? ..... 136

Cameroon museums: The language of symbols for a  
cosmo-architecture ..... 140



Telouet, Morocco photo by nicolas-cool unsplash.com





A return in history should allow us to rediscover its forms of manifestation through the different traditional fabrics of Morocco. In this return to history, the dimension of green is understood in its broadest sense, i.e., it is not limited to gardens and greenery, but encompasses several aspects related to the surrounding natural landscape, local building materials, and prevailing ways of life and production.

“ **Integration in the surrounding natural environment...** ”

The choice of the location of the traditional cities was not the product of chance, it is the result of the choice of a site guaranteeing the fertility of the soil, the abundance of water, and the beauty of the natural landscape. At the foot of the Atlas Mountains, the medina of Fez enjoys a privileged site in the middle of gardens, running water, in the center of a fertile plain, composed of two isolated cities: Fez El Bali and Fez El-Jadida, linked by water thanks to the presence of the Oued Fez. Thanks to its water source, several green spaces develop inside and outside the city, creating an infinity of gardens and orchards.

21 Rue chouara, Fès, Morocco photo by aleksandra rupar Unsplash.com

## MEDINAS: HISTORIC GREEN CITIES

In Africa, several new cities have been declared green cities, an appellation attributed to any city that respects the environment in the face of growing ecological footprint and peri-urbanization problems. However, they are often based on foreign models; a decontextualized import, despite undeclared ancestral know-how, risks leaving us to reproduce standardized replicas out of step with reality, and consequently lose the consistency of the green city and keep only its name.

However, if we go back in history, we notice that most of the consistencies sought in these new green cities have always been present in the old models of the traditional cities, without bearing a precise name; we can call them undeclared green cities, or before their time.



CARTE POSTALE LA FASIA A LA NZAHA Source [www.marocantane.com](http://www.marocantane.com)



## “ The green dimension invites itself generously in Intramuros... ”

Marrakech in turn was famous for its richness in greenery, in most of the intramural space was occupied by orchards and gardens. «To the east and north, the Palmeraie proudly spread its green mantle, extended further west by the gardens and orchards of N'Fis. As for the southern part, it remains the reserved domain of the Aguedal. This imperial park seems to bend under the gaze of all the weight of its rectangular corridor of five hundred hectares of orchards. Immense green carpet, it invites you, when the season comes, to explore the snowy peaks of the Atlas, which appear in the distance like the visible tips of an iceberg sitting on an ice floe. From this description by Mohammed El Faiz in his book «Marrakech Heritage in Peril», we can deduce that Marrakech was par excellence a city of gardens.

## “ The dimension of green between ornament and utility... ”

These green spaces, in addition to their aesthetic, therapeutic, and recreation functions, fulfilled a sanitary function thanks to the action of the plants guaranteeing the bacteriological purification of the air. Moreover, thanks to the emission of water vapor, they can temper the atmosphere of the medina, especially in periods of great heat.

It is also important to mention their social function: green spaces are places of meeting, sharing, and exchange; the inhabitants go there to walk, rest, admire and contemplate the landscape.

These gardens can have an economic function, as is the case with market gardens such as the Souanis in Salé. Thanks to these gardens, the districts of the medina are thus autonomous, through the gathering of diversified productions of vegetables, fruits, and some herbs necessary to the life of its inhabitants without having to move to get them.

This dimension of green does not remain limited to outdoor spaces but spreads even inside buildings, where several habitat models are built around the planted patio, a central courtyard that is the essential organ of the house. In general, trees are planted there, adapting the model of the quadripartite garden of Riyadh. This backyard is a microsome that connects the house with nature, sky, sun, fresh air, earth, and sometimes even water. The articulation around the central courtyard plays an important social role in the domestic life of the inhabitants. It is a space dedicated to family reunion and relaxation and is also used for all domestic work such as cooking and washing, but it remains a special place of sociability for women.



Meknes, ruelles dans la medina murs en pise et brique

## “ The green dimension at the origin of technical ingenuity... ”

The creation of these green spaces, their development, and their success were only possible thanks to the mastery of hydraulic techniques, and for this, we must mention the ingenious solution implemented in Marrakech. By the system of Khettaras, a system of underground drains feeding storage basins. The water from the khettaras is used to supply the city, often accumulated in open basins before being distributed through a network of watertight pipes called quadous.

In these cities, where the integration of the green dimension is always present, natural building materials are integrated into this landscape and merge with nature. Earth remains the most frequently used building material. This choice is due to its availability. It is a material easy to handle, representing important thermal qualities since it absorbs heat during the day before it enters the construction and releases it gently at night when the outside temperature drops: It is a wall that breathes in all seasons.



Palemerais marrakech, Photo Source Les villes-paysages du Maroc, Mounia Bennani



## “ The green dimension, and toponymy... ”

If we dig even deeper into the Medinas, we find that the green dimension was manifested in another form, this time dematerialized, present in the toponymy of several neighborhoods or alleys that were given names referring directly to a green element marking the site, a symbolic marking of a tree, a flower or a plant, etc... These names refer to the desire to highlight the natural characteristics of the place.

From immemorial time, the dimension of green has constituted in Morocco as in several African countries an essential component, an observation represented by the richness of the know-how found in our traditional fabrics, which manifests itself through its green spaces, its materials, and its techniques. The consistencies noted earlier make these fabrics «green cities before their time», or «undeclared green cities». Unfortunately, their know-how remains unknown, forgotten, or abandoned to follow a marketing movement based on new techniques in trends. Therefore the dimension of green loses its consistency and we find ourselves in front of an import of a name, and not a global concept adapted to the local context.

For that to be able to create a real model of a green city, it is going to be necessary to adopt an approach of contextualization starting from the existing, by returning to our sources to rediscover our ancestral green heritage in an approach of modernity adapted to the innovative techniques of our days.

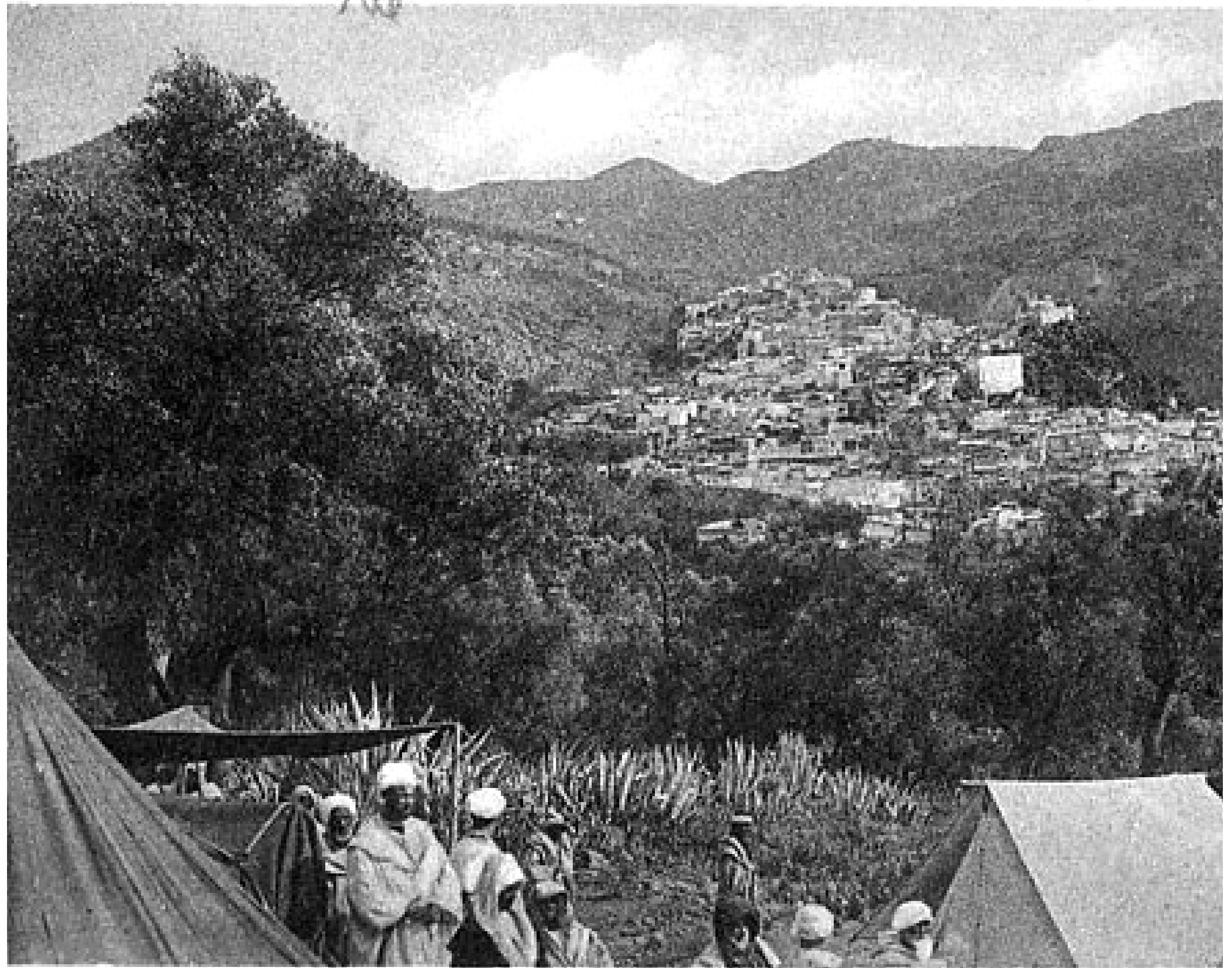


Photo Fian/rim

20 C. - MOULAY IDRIS — Une diffa (repas) dans les oliviers



# INFLUENCE OF RELIGION AND BELIEFS IN ARCHITECTURE



The high priestess Adedoyin Talabi Faniyi at the Ogboni shrine in the Osun-Osogbo Sacred Grove, a Unesco World Heritage site in southwest Nigeria. Credit...Adolphus Opara for The New York Times



Africa, the cradle of humankind! People often speak of it as a rich and fascinating continent, a land of natural and cultural diversity. And this is not just talking, because if you look closely, you will soon realize that this place is unique. From its breathtaking landscapes to the cultural practices and lifestyles of its people, this continent has much to seduce and inspire. However, one essential thing that is not talked about enough is the African monuments. They stand out because of their originality and, especially, the place they hold in the hearts of the local populations. Here, religion and beliefs have particularly influenced the development of societies and this is reflected in their buildings. Let's discover together four of these monuments built by the local populations themselves and which still make the whole world dream.

## “ Osun-Oshogbo Sacred Grove in Nigeria... ”

About 250 kilometers from Lagos, in the south of Nigeria, lies the town of Oshogbo, the capital of Osun State. On the outskirts of this town is one of the last surviving areas of the primary forest despite deforestation, the Osun Sacred Forest. It is crossed by the Osun River, which is very important to the local community. The state, the forest, and the river are named after the goddess Osun, a deity of the Yoruba pantheon who is believed to reside in the river. Throughout the year, tourists and pilgrims visit the river to pay homage to the goddess.

In the Osun-Oshogbo sacred forest, there are about 400 species of plants, more than half of which have medicinal properties. Amid this dense vegetation, numerous shrines, two palaces, five holy places, and nine places of worship have been laid out along the banks. Over the past four decades, numerous sculptures and works of art have been erected in honor of the goddess Osun.

From the 1950s onwards, the forest's history was marked by Suzanne Wenger, an Austrian adventurer and artist. After falling ill and being treated by a local herbalist, she married a Yoruba priest, adopted the local culture and devoted her time to restoring the shrines, defending the forest and the culture of the Yoruba, until she died in 2009. Together with local and foreign artists, Suzanne Wenger created the «New Sacred Art» movement in the early 1960s.



The three "heads" of the Ogboni Shrine, Photo source philipcarr-gomm.com



Alagere, Oba Lowaye the god of healing, Photo source philipcarr-gomm.com



Wood sculptures (similar to Native American totem poles) depicting the various Orishas/gods, Photo source philipcarr-gomm.com

Today, the modern sculptures they created stand side by side with the old traditional ones. These are intended to underline the sacredness of the place and to celebrate the deities. This restoration has given the place a new lease of life, making it a symbol of Yoruba identity beyond the country's borders.

Because of its sacred character, this forest is an important place for the community and its relationship with its deities. Indeed, regular worship services are held here, and every year festive processions are held to renew the mystical ties between the goddess and the people of Oshogbo, ensuring the preservation of the living cultural traditions of the Yoruba. The forest has been under the administrative control of the Osun State Government since 1990. Several measures have been put in place to prevent hunting, fishing, smuggling, logging and farming.

After being declared a national monument in 1965 and upgraded in status in the 1990s, the forest was declared a UNESCO World Heritage Site in 2005.



Osun-Oshogbo Sacred Grove Photo by Carsten ten Brink, Photo source philipcarr-gomm.com



## “ The Rock-hewn Churches of Lalibela in Ethiopia...” ”

Some 645 kilometres from the capital Addis Ababa, in what is now the Amhara region, lies the magnificent Lalibela. Perched on a mountainside, this monastic city is considered the largest Christian site in Africa. Its charm stems from the eleven rock-hewn churches built in the early 13th century by the order of King Gebre Mesqel Lalibela. Indeed, with the expansion of Islam, pilgrimages to the holy city were becoming increasingly difficult. King Lalibela, therefore, wanted to allow the Ethiopian Orthodox Christians to have their own Jerusalem on their land. Hence the names «Black Jerusalem» or «Ethiopian Jerusalem» are often attributed to this city.

Its monolithic churches dug below ground level, several tens of metres deep, are not only an essential cultural asset for the community, but they have also helped to shape the landscape as it is today. They form two groups in addition to an isolated church.

To the northwest: Bete Debre Sina, Bete Mikael, Bete Gologota-Selassié, Bete Maryam, Bete Meskel and Bete Medhane Alem. To the southeast, about 300m from the first group: Bete Gebriel-Rufael, Bete Merqorewos, Bete Abba Libanos and Bete Amanuel. To the southwest: the solitary cross-shaped Bete Giyorgis.



Bete Giyorgis, Photo by Sailko



Bete Abba Libanos, Photo by Bernard Gagnon



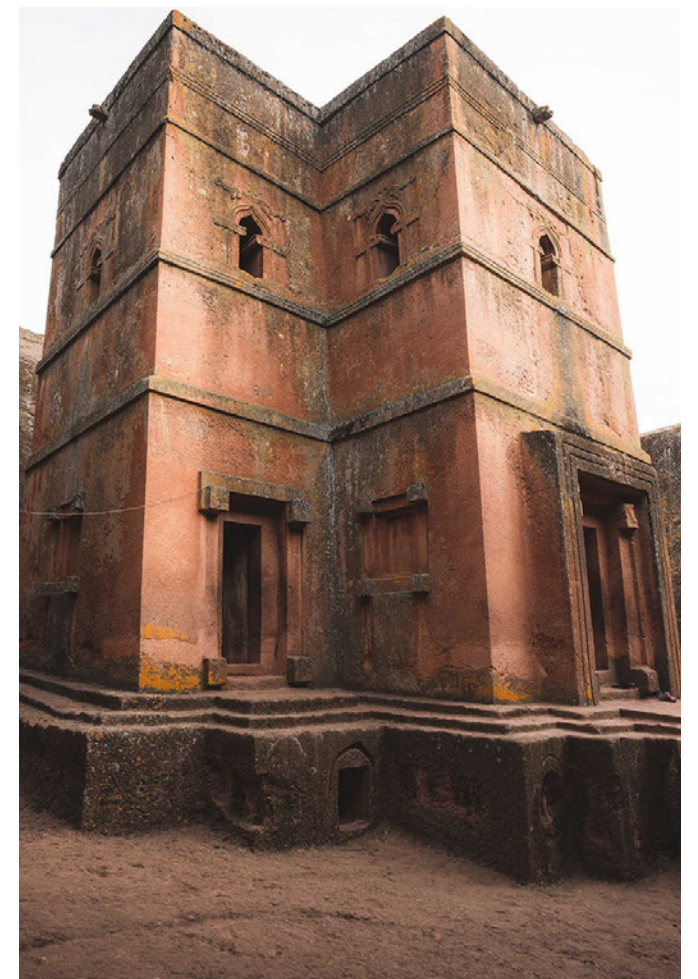
Beta Maryam, Photo by Bernard Gagnon

A network of tunnels and gorges carved into the rock connect all the churches. Other elements referring to the Bible have been included in the planning of the site over the years to reflect the authentic Jerusalem as much as possible. These include the Jordan River and Mount Sinai.

Listed as a UNESCO World Heritage Site since 1978, the site has been attracting more and more people from different horizons either on pilgrimage or to dis-cover the place. Like all other heritage sites, these churches are threatened over time by natural constraints, some more than others. After the creation of shelters scaffolded and covered with

corrugated iron sheets to protect them, UNESCO launched a competition in 2001 to design more aesthetic protection. In 2004, construction of the shelters designed by Italian architects Claudio Baldisserri, Lorenzo Sarti and Aldo Aymonino began.

However, these sloping roofs supported by gigantic metal pillars are not unanimously accepted, and for some people represent more of a danger than protection.



Bete Giyorgis, Photo by mustseespots.com



## “ The Great Mosque of Djenné in Mali... ”

In the heart of the beautiful city of Djenné, listed as a UNESCO World Heritage Site since 1988, lies a jewel considered by many as the most prestigious monument in West Africa: The Great Mosque of Djenné. In addition to being the largest mud building in the world, it is considered to be the supreme representation of the Sudano-Sahelian architectural style. This particular style is characteristic of this region and makes the mosques in the Sahel very recognizable.

But unlike the other mosques, the Great Mosque of Djenné was built in a place that had not previously hosted a religious building. It was built in 1238 by Sultan Koi Komboro on the site of his palace. After his conversion to Islam, he decided to demolish his palace and build a mosque in its place. The next sultan built the towers and the one after that, the surrounding wall. In 1819, the city was taken by Sékou Amadou, following a holy war. He decided to destroy the mosque built by Koi Komboro because it did not reflect the simple and uncluttered Islam he preached. He, therefore, built a more modest mosque and prevented access to the great mosque which, without maintenance, rapidly deteriorated under the action of the elements. When the French arrived years later, the mosque was in ruins. It is under this french occupation that the present building was built. It was built between 1906 and 1907 under the supervision of Ismaïla Traoré.



The building was built on a platform of 85 m in length and 75 m in width with non-parallel sides. The platform is elevated 3 m above the natural ground level and is accessible thanks to six staircases that symbolize the passage from the profane to the sacred. The building has a maximum capacity of about 1000 people. Despite the apparent symmetry of the building, the facades are all different.

Several elements contribute to making them sublime and authentic; in particular, the texture of the earthen material, the openings, the pilasters surmounted by cones, and above all the bundles of Rodier palm sticks which also serve as scaffolding during the plastering work. The eastern façade, facing Mecca, is the most ornate and monumental with its three imposing minarets. The building has a roofed section supported by 90 huge pillars connected by ogival arches. The roof, which is 8 m above the lower floor, has 104 holes for lighting and ventilation of the interior spaces. An uncovered area at the rear is bordered on three sides by galleries.

Every year, maintenance work is organized for this colossal and fragile jewel, to protect it before the arrival of the rains. The whole community takes part in the plastering work under the direction of the Djenné masons' guild. The material used is a clever mixture of earth and water, with rice bran, shea butter, and baobab powder, made by the inhabitants themselves. This activity is accompanied by great festivities that are very important for the community.

The Great Mosque of Djenné in Mali, Photo by AFPphoto\_Michele Cattani



The Great Mosque of Djenné in Mali, Photo by AFPphoto\_Michele Cattani



Inside the Great Mosque, Photo by Juan Manuel Garcia



## “ Aksum or Axum in Ethiopia... ”

Located in a mountainous region near the northern border of Ethiopia, the city of Aksum was between the 1st and VIth centuries the heart of ancient Ethiopia, the Aksumite Empire. This Empire at the crossroads of three continents, Africa, Arabia, and the Greco-Roman world was more powerful than the Eastern Roman Empire and Persia. Today, the old city of Aksum, a symbol of this former glory, is characterized by massive ruins dating from the 1st to the XIIIth century. These include monolithic obelisks, giant stelae, royal tombs, and ancient castles. The city, with its many archaeological sites, was declared a UNESCO World Heritage Site in 1980.

Among the most important sites in the city is a large stelae park with tens of monolithic obelisks. These are among the largest man-made monoliths. The largest one still standing is over 23 meters high and has a beautiful engraved decoration. However, there was a 33 meters high one that is said to have collapsed during its installation. The broken pieces are still on the site. The inscriptions made in the stone were certainly not only of decorative value. They have proved to be of great importance to ancient historians. Some of them contain texts in three languages, Greek, Sabeen and Geza, inscribed by King Ezana in the 4th century after Christ.

In 1937, after the occupation of Ethiopia by Mussolini's armies, one of the Aksum obelisks was removed from the site and taken to Italy as a war trophy. It was erected in Rome, in front of the building that housed the Italian Ministry of Africa until 1945 and which became the headquarters of the FAO in 1951. After committing to return it in 1947, Italy finally did so in 2005. This was followed by the reinstallation of the obelisk on its original site in 2008.

Obelisks were used as tombs for the kings of old. Over time, many tombs have been excavated, some looted, others spared. Their contents are now preserved in the archaeological museums of Aksum and Addis Ababa.

Another major site in the city is the Church of St. Mary of Zion, located near the large stelae park. It is one of the churches built after the introduction of Christianity in the 4th century after Christ and is supposed to house the Ark of the Covenant.



Axoum (Éthiopie), Photo source UNESCO



Eglise Maryam Seyon, Photo by A.Savin



New Maryam Seyon Church Axum, Ethiopia photo by Chim Chee Kong

It is a bit sad that such masterpieces are often ignored and it is even more worrying to learn that some of them are threatened with extinction. Indeed, alongside the list of Unesco World Heritage sites, there is the list of World Heritage in Danger. Several of these extraordinary sites around the world are already listed, threatened with extinction mainly by human factors such as conflicts or uncontrolled urbanization.

The ancient city of Djenné has been on this list since 2016, as the insecurity in the region prevents the maintenance and protection of this jewel. On the other hand, climate change would also be a threat, as it would have a significant impact on the availability of quality mud for construction and maintenance work such as the Great Mosque. None of the other heritages mentioned above is included in this list, but the committee has discussed in the past the possibility of including Lalibela. Several of its monolithic churches are indeed in a state of severe deterioration.

The good news is that these monuments are increasingly being considered, and steps are being taken to ensure that for a very long time to come they can continue to maintain the harmony of local societies, provide information on historical facts and ways of life, and above all inspire us with their majestic and lasting character.





Traditionally, the homestead is identified as a Talensi man's focus, source of interests, prime initiatives, deepest emotional connections, values, shelter, and esteem of life. Talensi's view on house construction is that men put up structures and roof them while women cover the structures for habitation, but the contribution of women is not counted, though the entire construction process involves members of varied ages, social standing, skills, and genders.

The fusion of innovation, local knowledge, and resources promotes low-cost and sustainable communities tailored to their specifications. The traditional houses of the Talensi are circular with flat roofs although in recent years there has been the introduction of rectangular forms. The buildings are constructed with mud. Wall construction usually includes hand-molding kneaded laterite into standard spherical sizes and using the balls to construct the wall layer by layer. Finishing also involves a standardized process of plastering the wall surfaces with a mixture of mud, cow dung, and juice from boiled empty locust bean tree pods. The juice acts as a stabilizer, hardener, and waterproofing.

As a standard schedule, traditional Talensi construction normally happens in the dry season between December and April. This period is without rainfall and the entire construction process, from site preparation to wall and floor finishing, is planned in this period. The need to standardize the construction schedule within this period is further strengthened by the fact that most traditional construction participants are farmers and would be engaged in farming in the rainy season. The standardized scheduling in the dry season is transparent and understood by all participants, thereby enhancing the reliability of the commitment of the entire team to planned activities for projects. This tends to stabilize the flow of construction activities within the planned duration. Sustainability through the indigenous building culture of Talensi is environmentally friendly associated with less generation of waste. This fundamentally stems from the recyclability and reusability of traditional materials. Another dimension focuses on the ability of the traditional building materials to merge back into the natural environment when they are not in use.

Tengzug village, Northern Ghana photo source imb.org

## TALENSI TRADITIONAL HOUSES GHANA

The traditional building of Talensi is principally centered on the design and construction of homesteads. The architectural circular form of these traditional buildings, its homogenous layout, choice of construction materials, and process promotes their indigenous cultural identity, stands as an embodiment of the value of social ties, represents a substantial projection of hierarchical relations that make up a family or clan.

Talensi is an area in the Upper East region of Ghana in West Africa, culturally and administratively termed Talensis. House Building among Talensi is guided by a solid sense of kinship, characterized by a cooperative effort by the clan to which a person belongs.





## WHAT IF WE REIMAGINED ANCIENT AFRICA?

The Studio KÄ imagined in 3D an ancient West African city, surrounded by the softness of the warming rays of a fading sun. This fantasy land would be the fusion of several ancient African places, with the giant Baobabs of Madagascar, the great river reminiscent of the Ivorian Sassandra, and the architecture of its houses inspired by the Idool villages of Cameroon and Tiebele Burkina Faso. A nod is also made to the emblematic Mosque of Djenné in the heart of this imaginary city.

The idea of this African hybrid city came from a feature-length animation film project that our animation studio Studio KÄ is currently working on. Our story takes place in the 18th century in a prosperous Africa punctuated by the hot winds of the Sahel, by the sounds of the craftsmen's tools and traditional Mandingo music instruments, by the reddish color of the earth, the gold of the ornaments, the head carriage of the women...



Studio KÄ  
Imagine



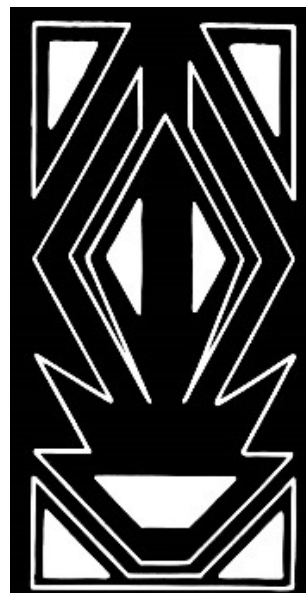
# CAMEROON MUSEUMS: THE LANGUAGE OF SYMBOLS FOR A COSMO-ARCHITECTURE



The Royal Museum of Fomban



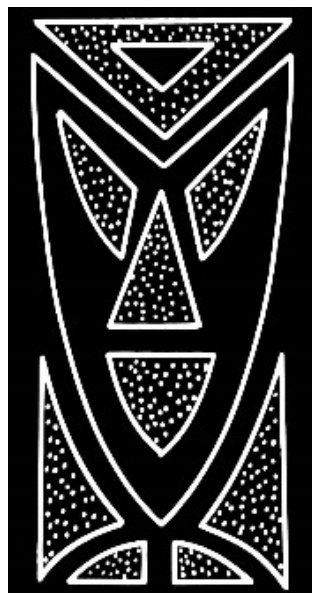
The Route des Chefferies is a program of safeguarding and promotion of heritage in Cameroon, which, for about twenty years. It works in the restoration and creation of spaces aimed at promoting the heritage of the populations, the chiefdoms, and the region as a whole. This program, innovative in Africa, integrates a large pole dedicated to the development of the territory, to architecture, and to the design of heritage. This pole works on the cultural and tourist development of the territory by proposing buildings and places imbued with an «African» scenography that allows for the reinforcement of a rural cultural centrality. The urbanity here is specific because it navigates in a world where the living rub shoulders with the world of the ancestors, the invisible world. It also contributes to the rehabilitation of traditional buildings in danger, and participates in their safeguard in the case of various programs. Thus, since 2018, the restoration work carried out by several chieftaincies has led to the nomination of several traditional buildings (traditional palaces of Bandjoun, Bapa, Batoufam, Mankon, Bafut ...) to the list of World Heritage with UNESCO. The contemporary architecture of the museums and heritage huts (14 heritage huts have been built to date) is fundamentally inspired by the traditional aspects of the Grassfields, which will be recalled in the first part of this article, in order to contribute to the scenographic development of the territory, notably through the creation of cultural buildings detailed in the second part, all within the framework of work in communion with local craftsmen and artists, but also with the elements offered by nature in the Grassfields.



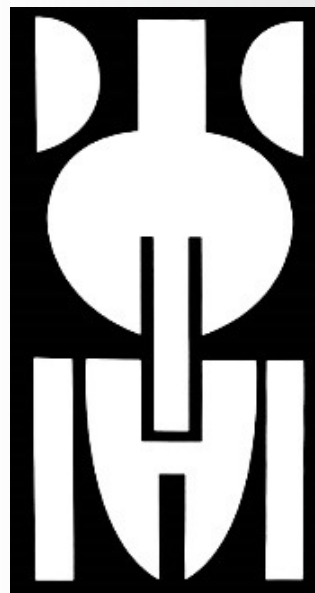
Buffalo mask, Copyright  
Djache Nzefa



Stylized spider, Copyright  
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Woman's mask, Copyright  
Djache Nzefa



Elephant mask, Copyright  
Djache Nzefa



Dschang Museum of Civilization Cameroon



Interior Dschang Museum of Civilization Cameroon

## “ The Museum of Civilization...”

The Museum of Civilizations is an interpretation center of the civilizations of Cameroon open to the public since November 20, 2010. This building, located on the shores of Lake Dschang, has become an authentic place of leisure and culture thanks to its nautical base (2005), its beach volleyball court, its playground (2006), its craft center (2010) and very soon a Garden of Civilizations.

After an introductory presentation of Cameroon over the centuries, the visitor is invited to discover the Cameroonian people in its identity both plural and fusional: the peoples of the forest with their totemic expression, the peoples of the sea with the revival of the Ngondo cultural festival, the Sudanese-Saharan peoples with their lamidats, chieftaincies, sultanates and the peoples of Grassfield with their mysterious chieftaincies. It is an interpretation center that promotes an integrated approach to cultural heritage that allows visitors, especially local communities, to reconnect with their roots while learning about the cultures of other regions. This approach is part of cultural tolerance, an important vector of cultural diversity.

### *A strong contemporary cosmogonic architecture*

The contemporary African architecture, signed by the architect Sylvain Djache Nzefa, founder of La Route des Chefferies, is characterized by the symphony of symbols: spider, buffalo, elephant woman, Abbia jettons, and local languages.

The Museum of Civilization, with its multiple functions, is endowed with history, knowledge, and intelligence. In the world of the living, in the Bamileke cosmogony, men and animals dialogue, and this dialogue is also done in representation. Among the living, the one who possesses the sum of all experiences is the old man. Everywhere in Black Africa, the old man «was» considered to be the wise man, the connoisseur, the one who «held» the truth, through his multiple experiences. It is his knowledge that is symbolized through the spider. According to Pierre Harter: «The spider-mygale, symbol of knowledge, often takes the form of a small single or double circle, with four crossed legs and not eight, which makes it possible to compose on certain mask headdresses or certain engravings of libation horns, a sort of diamond or square mesh net. The spider thus appears as the central element of the architecture of the Museum of Civilization: it is taken here as an architectural element that gives rhythm to the façade.



The façade is treated as a mask through blue moldings. There is a desire to hide what is behind. Let us not forget that in the Negro-African, the masks speak; the wearer is possessed by his mask. Here, the wearer is the museum. The mask representing the spider expresses the contents of this building, that is, knowledge. The buffalo and elephant masks symbolize strength, power, grandeur, and wealth. Another façade of the museum is covered with alphabets and the word «welcome» written in several languages and dialects spoken in Cameroon. The eye is busy here capturing the multitude of information, codes, landmarks, which are symbols representing the objectives, the roles of the building namely: educate, preserve, transmit, innovate... Through these symbols, a man approaches what is knowledge, intelligence, society, cosmology, and cosmogony.

The motifs used for the moldings on the facades are stylized forms of masks, motifs such as the spider, the buffalo, the woman, and the elephant.

The act of building or conceptualizing objects and habitats is seen as a support for knowledge and understanding of the other. It leads to a review of all that is at stake in the constitution and foundations of the different civilizations of Cameroon. The visitor is thus led to question his cultural identity by a better knowledge of himself, which facilitates in principle the dialogue between civilizations.

#### *An experimented African museology*

The Museum of Civilization is developing an African museographic experience that aims to put the public at the heart of the process through didactic support and contextual settings that allow visitors to immerse themselves in the heart of Cameroonian cultures. It is not so much a matter of showing as of creating an experience of a visit by provoking sensations and emotions.



Exhibition on the Sudano-Sahelian cultural area

Realized by a Franco-Cameroonian team, the content of the exhibition is based on a scientific and interdisciplinary approach (history, archaeology, ethnography, sociology, architecture, and heritage...). Dynamic and educational. The exhibition has been conceived, in space and time, in such a way as to integrate current events. With more than 500 objects, 1500 illustrations, video spaces, the museography integrates in an important way the traditional African materials worked in a contemporary approach by the local craftsmen (varnished or burned bamboo, banana bark, obom bark, cowries, beads, raffia, earth, coconuts...) This is the first time that we discover how traditional skills can be highlighted in contemporary scenography.

The Museum of Civilizations does not find its justification in the existence of a collection of objects of its own; the pieces presented illustrate the discourse chosen by the designers and come mostly from loans and deposits of the chieftaincies.



Royal Museum of Fouban, Photo by Leandry JIEUTSA



Royal Museum of Fouban, Photo by Leandry JIEUTSA

#### *Royal Museum of Fouban...*

The Bamoun Sultanate is located in the Western Region of the Republic of Cameroon in Central Africa. The Sultanate is at an altitude of 1200 meters and covers an area of 7,625 Km².

The current Sultan, Ibrahim MBOUOMBOUO NJOYA, 19th of this dynasty, animated by the immeasurable concern to safeguard this rich multi secular heritage bequeathed by his ancestors, has undertaken for nearly two years, the construction of a new museum adapted to the museum rules and spacious enough to contain all the objects of the collection.

The architect Issofa MBOUOMBOUO has thought of a symbolic architecture that combines tradition and modernity and which, in itself, is enough to be a museum. This symbolic architecture is a set composed of the coat of arms of the Kingdom such as:

1 - Double bell: Symbol of patriotism. It is an instrument used by the King to stimulate and galvanize his troops at the front.

2 - The spider: Symbol of work. The King wants his people to be as hardworking as the spider who spends all his time weaving webs.

3 - Snake with two heads : Symbol of the simultaneous victory of the Bamoun people on two fronts. It symbolizes the power of the Kingdom.

The result of this masterpiece is the first vector of communication of this museum, through its cosmogonic architecture, following the example of the Museum of Civilization in Dschang.



The association of the three elements is a particular symbol in Bamoun country which represents power

Royal Museum of Fouban, Photo by Leandry JIEUTSA



“ **Heritage hut, community museum of the Bamendjinda chiefdom: art, tradition and slavery...** ”

Its permanent exhibition, unique in the region and in Cameroon, highlights all the specificities of Bamendjinda under the theme «ARTS-TRADITION AND SLAVERY».

The Bamendjinda chieftaincy has been marked by slavery, whether it be slave trade or customary slavery. Some cultures still commemorate this past. Its historical and social consequences are perceptible in its plastic production, in its cultural expressions, in the organization and functioning of its chieftaincy. SM TANEFO, the current chief of the Bamendjinda, actively participates in the work of memory on this part of the history of Cameroon.

The Bamendjinda community museum plays a role in the collective memory at the social, cultural, educational, and economic levels. Through objects, illustrations, paintings, videos, and a library, this museum is accessible to the general public. It is playful, complete, and enhances the cultural heritage of the chiefdom. The visitor, through the decorations, is led to discover not only Bamendjinda from its origins to today, but also the history that has marked the social organization of the chieftaincies of the West and of Cameroon.



Community museum of the Bamendjinda chiefdom, Photo source: Route des chefferies



Batcham mask, Photo source: Route des chefferies



Community museum of the Bamendjinda chiefdom, Photo source: Route des chefferies

The architect Sylvain DJACHE NZEFA once again highlights on the main façade of the museum a mask called «Katso mask» or «Batcham mask». This mask is generally used in secret societies and its presence on the façade is a sign of celebration of this object.

Slavery is a historical phenomenon common not only to the Bamendjinda people, but to Cameroonians, Africans, and many others. It is our past, our history, our heritage, our future. This museum is the embodiment of the memory and cultural vitality of the Bamendjinda people.



## “ Heritage case of the Bapa chiefdom, rock village... ”

The permanent exhibition of this museum has 7 spaces related to the central theme: «MAN, NATURE AND BELIEFS». The spaces defined by the Bapa traditional chief, SM David SIMEU, are the following:

**Discovering**: which presents the history and relations between Bapa and the neighboring villages, and the organization of the chieftaincy and the place of the secret societies;

**Soak up**: presents the nature and physical geography of Bapa;

**Create and build**, presents the different poles of activity found in Bapa, as well as the evolution of architecture, from bamboo constructions with interpretations of weavings, to earthen brick construction and spouted earth;

**Savor**, highlights the gastronomy of the 4 cultural areas of Cameroon, the methods of conservation of traditional foods and the food prohibitions of the past and present;

**Warrior**, presents the power to heal as well as the place of totemic animals in the Bapa culture;

**To think**, invites us to reflect on the protection of the environment with a nod to CIPCRE, and also unveils the modified model of the Bapa chiefdom;

**Blending in**, displays nature, the medicinal and edible plants that nature offers us, with a miniature map of the Bapa village, and the tchui waterfall;



Heritage case of the Bapa chiefdom, Photo source: Route des chefferies



Exhibition inside the heritage case of the Bapa chiefdom, Photo source: Route des chefferies

This museum is marked by its picturesque architecture, which values the conical roofs of the West, the stabilized earth brick and especially its entrance in the shape of a cave which calls upon the various caves and rocks found in the locality and its surroundings.

The scenography here highlights the local know-how in a process of transformation of vegetable waste. Thus, the work carried out by the architects of the DRC with the craftsman Banana Fashion led to the innovation of wall coverings from: dried banana leaves, peanut shells, dried corn leaves, colored woven straws... These decorations extend the understanding of the theme of the exhibition which is to bring man closer to nature. In addition to the need to highlight the know-how and beauty of the Bapa culture, to perpetuate it for the education and edification of future generations are the main motivations of the chief.

Drawing inspiration from traditional architecture in order to create the architecture of tomorrow is a guarantee of safeguarding and promoting traditional know-how. The Route des Chefferies, through a creative scenography of the territory, proposes a reinterpretation of the great architectural principles without denigrating them. It uses symbols, materials, and traditional elements to give a new vision of the territory. The Route des chefferies is currently working on new concepts within the framework of the Route des Seigneurs de la forêt, Route de l'eau and Route du sahel programs.



Heritage case of the Bapa chiefdom, Photo source: Route des chefferies



Exhibition inside the heritage case of the Bapa chiefdom, Photo source: Route des chefferies





## THE CIVILIZATIONS OF CAMEROON

By

Sylvain Djache Nzefa

Architect DPLG- Urbanist OPQU

Director of the publication

General Coordinator

ROUTE DES CHEFFERIES

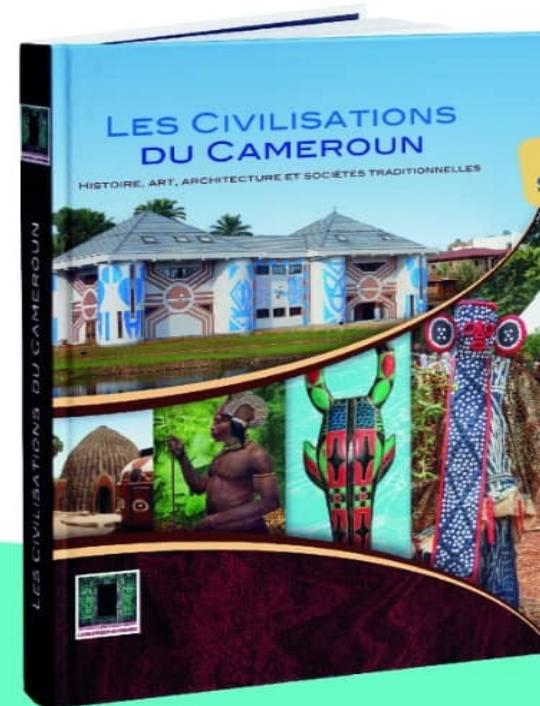
The clash of civilizations has provoked numerous debates on the international scene in recent years, reviving existential questions about the identity of peoples. By refusing the Hegelian scheme of reading human history, the book on the civilizations of Cameroon set out to elaborate, for the first time in Cameroon, a comprehensive document that presents the foundations of Cameroonian society today by addressing a trilogy: Who are we? Why are we here? Where are we going?

«The Civilizations of Cameroon» is a simple book that leads us to question our identity, but above all it challenges us in this quest for forgotten culture, dominated culture and unknown culture. With this symptomatic observation on the ignorance of the socio-cultural foundations of the 250 ethnic groups that make up this country, it makes a valuable contribution to understanding between peoples without undermining the desire to preserve cultural identity. But cultural identity and dialogue must go hand in hand in order to avoid the conflict of civilizations on a national and international scale. The federative approach at the local, national and international levels is based on a shared and solidary vision of our heritage, which is the main axis of the understanding of the multicultural and civilizational fact.

Éditions  
LA ROUTE DES CHEFFERIES

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Route des Chefferies

This book is part of a current of thought advocating a scientific rereading of Cameroon's past and the restoration of historical consciousness through archaeology, which allows us to find the first traces of human occupation such as the ceramics of the site of Bwambé (Kribi), the Sao civilization as well as the Iron Age, the slave trade with the recent discoveries of the site of Bimbila or the hidden history of Abraham Hannibal in Pushkin, the painful independence ... The authors lead us to a rediscovery of this nation through the peoples of the sea, the lords of the forest, the chieftaincies of the Grassland and the Sudano-Saharan peoples. Specific themes are described: rites, traditions, religions, mysteries, secret societies, dances, notables, queens, princes, kings, ethnic groups, symbolism, arts, architecture, lamidots, lamidats, chieftaincies, etc.

The focus is on the foundations of architectural and artistic creation in Cameroon, which are still little known to the general public. Through glimpses of the different social practices, this book leads us to discover everything that constitutes the act of designing spaces and objects in these traditional societies.

“ Through this work, which revives the regions, architecture, art, culture and environment of Cameroon, Sylvain DJACHE NZEFA and his team offer researchers and scientists keys and paths, African youth landmarks, and Africans in general their pride and humanity. May this example be emulated, and allow this continent whose memory has been erased for too long to rediscover its past in order to better build itself because a people without history is a world without a soul. ”

**Alain FOKA, Journalist**



“ This book presents us with this heritage, undoubtedly the most beautiful and most precious that our history has bequeathed to us. It commits us, individually and collectively, to do everything possible to protect this heritage and pass it on to future generations. In short, I am pleased to salute the great merit of this didactic book, which already appears as a precious instrument of consolidation of our living together. ”

**Djaïli AMADOU AMAL, Writer, Prix Goncourt 2020 des lycéens**

“ This book is a true plea for cultural reconnection that the Route Des Chefferies proposes to us, and which reminds us that the tangible and intangible heritage is the foundation of the memory of the peoples. We owe it to ourselves to protect it with the help of current generations, in order to transmit it to future generations. ”

**Lazare ELOUNDOU ASSOMO, Architect - Town planner**





# 05 CITIES PIXELS AND COLORS

The African city in theaters .....	148
WEART'CHITECT: For the urban to become again the image of our identity .....	152
The Heritage Wall Benin .....	158



The Heritage Wall Benin, Photo by MAGINE BENIN





«**Kinshasa Chronicles**» currently housed at the Cité de l'Architecture et du Patrimoine in Paris, reveals its urbanity against a backdrop of artistic creativity. Accessible in virtual visit, this exhibition is focused on the hidden soul of the city to unveil. Crisscrossing angles of discovery brought by the team of Dominique Malaquais. [www.citadel.architecture.for-Kinshasa](http://www.citadel.architecture.for-Kinshasa)



EXPOSITION Kinshasa Chronicles Photo by Gaston Bergeret

«**CountrySide The Future**», initiated by the urban architect Rem Koolhaas was presented in 2020 in New York at the Solomon R. Guggenheim Museum. Places from different countries were treated, USA, China, Netherlands and Kenya in reaction to the galloping urbanity. [www.oma.com-CountrySideTheFuture](http://www.oma.com-CountrySideTheFuture)

This mode of introspection by parallelism brings us back to his edifying exhibition in 2000, «**Mutations**», revealed at the Arc en Rêve space in Bordeaux. It is a staging of Lagos alongside other cities outside the continent and an affirmation of the concept of the generic city that links them. [www.oma.com-Mutations](http://www.oma.com-Mutations)

In Dakar, in 2019 were exposed with optimism to the final graduation project of young graduates in Bachelor of Architecture, «**50 Architects for Africa**». [www.au-senegal.com-lequotidien.sn-50architects for Africa](http://www.au-senegal.com-lequotidien.sn-50architects for Africa)

The year before, «**Raw Materials**», through the architects Nzinga Mboup and Carole Diop, exhibited «Citéologies-DakarMorphose» with a title that announced the content. [www.afrikadaa.com](http://www.afrikadaa.com)

## THE AFRICAN CITY IN THEATERS

### Constructed views - Urbanities on display

In recent years, a new vision of African cities that could be described as postcolonial has taken shape through exhibitions on this subject. The urbanity of these cities is now defined beyond their colonial past. I will mention a few exhibitions that stand out not only for the themes they address but also for the specificity of their approaches. They draw from all the registers related to the expression of a city in movement, through photography, drawings, stories, artistic works. To seize the multiplicity of the emanations of the communities which compose them and to interpret them in order to understand, even to anticipate the speed of the urban evolution. Urbanism and architecture often complement each other through other prisms for a transversal reading of several cities placed in parallel.



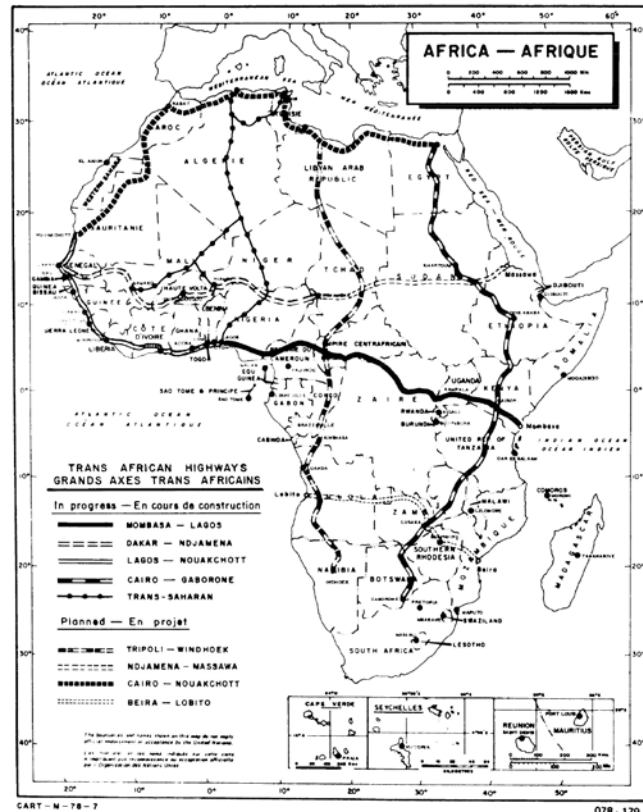
CountrySide The Future Photo by Laurian Ghinitoiu



[www.afrikadaa.com-Dakarmorphose@RawMaterialCompany](http://www.afrikadaa.com-Dakarmorphose@RawMaterialCompany)



The Museum of Architecture in Munich in 2018, explored the theme «African Mobilities» curated by Mpho Matsipa. This significant research initiated by workshops on the spaces resulting from migrations concerned several cities from Johannesburg to Praia. [www.architekturmuseum/de-africanMobilities.org](http://www.architekturmuseum.de-africanMobilities.org)



Map of the Trans-African Highway. Source UN Economic Commission for Africa, 1979

«**Afrocit**y-Urbanités enchantées» will start in mid-July at the Nantes School of Architecture, organized by Rossila Gassanou, architect and scenographer, who has been able to collect the words and actions of women, actors in the manufacture of the built environment and the city, and transcribe them into videos. [www.nantes.archi.fr](http://www.nantes.archi.fr)



afrocit-y-urbanites-enchantees Photo by Gianish Liloo



Equestrian figure, terracotta, Old Djenne (Jenne-Jeno), Mali )13th-15th century, Photograph courtesy Franko Khoury. National Museum of African Art, Smithsonian Institution, Washington D.C.

In 2014, at the Venice Biennale, was presented for the first time a selection of projects of young architects from Africa «**Young Architects in Africa**» led by ArchiStudio of Paris. [www.issuu.com-catalogue-yaa](http://www.issuu.com-catalogue-yaa)



Architects of Justice, Seed library (Afrique du Sud), Courtesy of CAASI

This year, African architects are present until October, under an African label, Inno Native Approaches with an exhibition «**New Blood 2021**» which confirms the new generation, this time selected by the architect Joe Osae Addo, working on Africa, from Africa, Europe or USA. [www.newblood2021.com](http://www.newblood2021.com)



NEW BLOOD 2021

All these initiatives demonstrate that the subjects addressed feed the reflections and create the debate in a professional environment of connoisseurs. The cities of Africa are on the move and the media repercussion of these exhibitions should be audible to the greatest number of people as well as to public and private authorities so that the issues raised are echoed and the quality projects in urban planning or architecture, carried out, are shown and valued. This effect can only be beneficial to improve the quality of life of the inhabitants and users of spaces and territories.



The ambition of this initiative fits well with the renovation and construction of local facilities of the Master Plan of Development 2017 - 2020 which aims to «strengthen the capacity of the university library.

The advent of the computer tool makes libraries less and less visited by young people. However, a library is a place of meeting and exchange, a framework for learning, training, and dissemination of knowledge. Mural paintings are used by several libraries to not only reverse the trend by captivating more people, but also and above all to transmit a message.

These murals are made by WEART'CHITECT which is a collective of independent artists who have the common vision to promote the plastic arts around the world by making their modest contribution. These artists come from various horizons; from Burkina Faso to Cameroon, passing by Congo and Togo, 04 nationalities are mixed together. They reconcile the different generations, call for identity awareness and transmit values on the need to cultivate oneself and precisely to acquire knowledge.

It should also be noted that this project was done with the participation of students from the University of Lomé, with an approach based on a real participatory approach that advocates the transmission of knowledge and know-how.

“ **Letters, music and knowledge material...** ”

The alphabet is to literature what primary forms are to sculpture. In our creative process, we went to the root of the expression by basing ourselves on the letters of the alphabet which are indeed only sounds, vibrations to which we attributed a meaning. So words, letters are music. Each material also has a particular vibration, each color a wave.

Letters, music, painting, and sculpture come together to form a unity. The work wanted to be dynamic, musical, that's why the composition is wandering in the background on all the east facades of the library. The hollowed balls in the shape of mouths pronouncing the sound give rhythm to the composition by accentuating the musical character of the work. Far from the plastic aspect of the composition, the work wanted to put forward the great names of the artists of the words: the writers; and also the black scholars in general in order to recall the contribution of the civilization in the evolutionary dynamics of humanity.



## WEART'CHITECT: FOR THE URBAN TO BECOME AGAIN THE IMAGE OF OUR IDENTITY

Visibility is a good indicator of performance and competitiveness for an institution such as the University of Lomé. The Library and Archives Department (DBA-UL) in its communication strategy in line with one of its missions which is to «provide an adequate and conducive environment for intellectual activity at the University of Lomé», proposes through the redevelopment of the Annual Work Plan to create frescoes on the walls of the Library of the University of Lomé.

These frescoes will be realized in bas-reliefs on the visible parts of the wall from the main entrance of the university campus.



Frescoes on Library wall at the university of Lome, Photo by weart'chitect





The background of the composition is filled with motifs and Egyptian hieroglyphs. They are in the background to recall the past, to show that the modern letters derive from these symbols. These African symbols show the richness of our history.

The earth colors evoke our origins, the yellow that wanders in the composition as the primordial light that emitted by the creative word tore the veil of darkness, of ignorance.

### “ **Triumph: Success is the reward of the brave...** ”

The artist addresses through this masterpiece a message of bravery to all those who cross the doors of the house of knowledge in search of knowledge, a variable source of success.

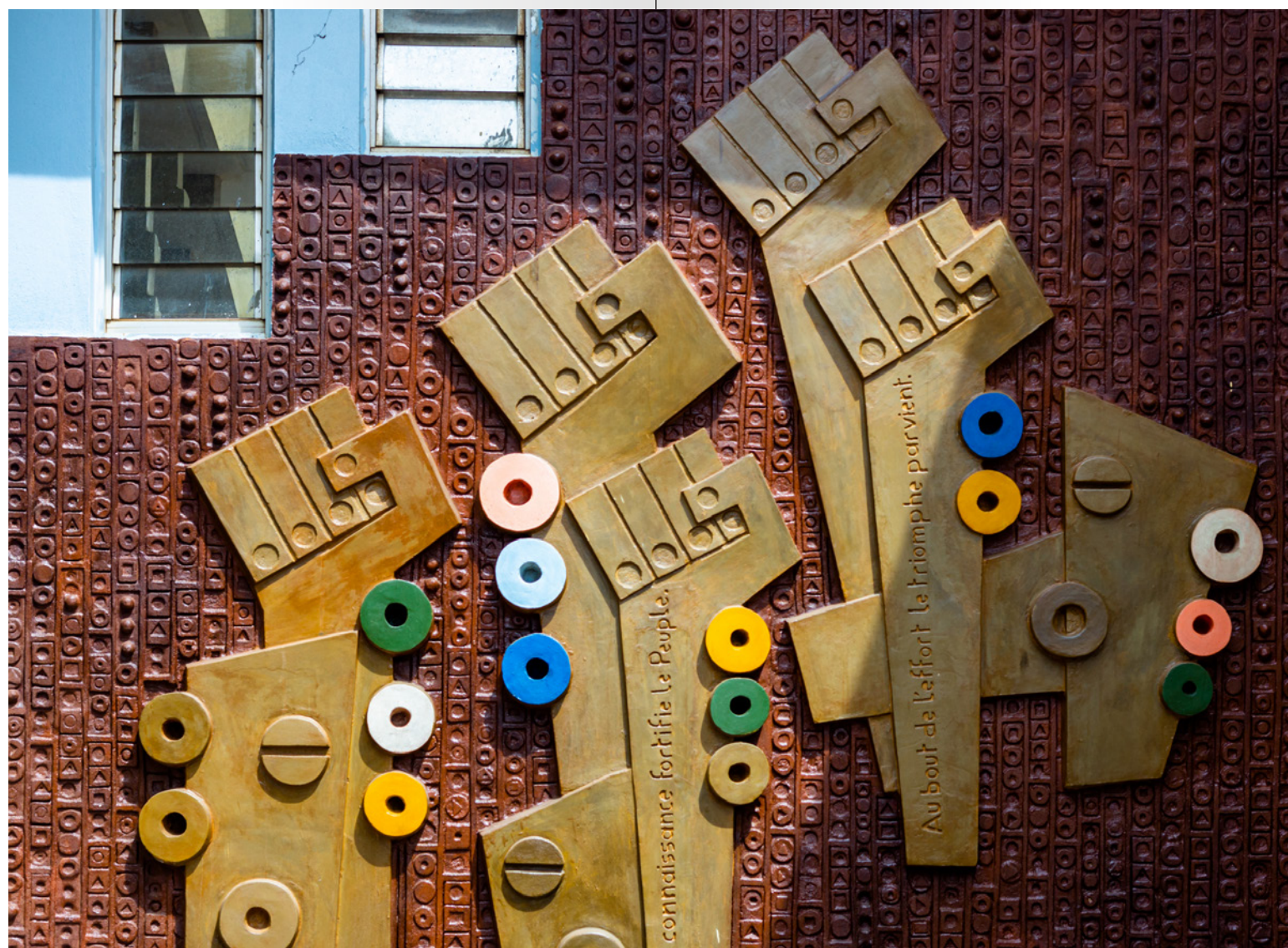
The fresco stands majestically on either side of the entrance to the university library by a symmetrical composition representing triumphant hands strewn with a set of polychromatic rings that brings a certain light to the work, symbolizing the success and testifying to the bravery shown by lovers of knowledge.

These hands then rest on a background strewn with rough patterns that recall the path that leads to success, a path often strewn with many difficulties but that at the end of the effort the triumph comes.

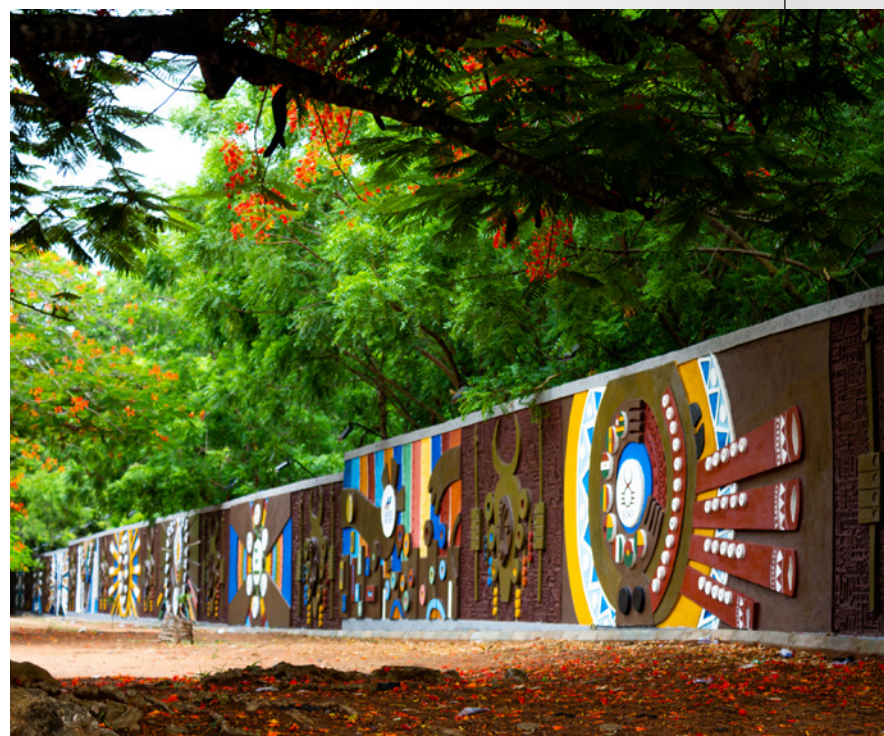
### “ **The lovers of knowledge...** ”

To have knowledge is to know. Why not seek this knowledge to the point of being in love with it? This is the meaning of the lovers of knowledge, 12 in number like the 12 months of the year. Lovers, with heads full of emotions and proudly holding the most conventional symbol of knowledge: the book. The purity of the artistic gesture, the sobriety of the pigments coloring the work and the minimalism of the infinity of the geometric compositions in the background, describes in the noisy silence of these lovers, the emotional maturity of the work. In the way that the exhaust pipe marks an indelible stain on the skin of the wounded, we are stained, by what we read, we know.

And in the painful pleasure of what learning is, the 12 lovers of knowledge invite us to frequent the library, not only the walls and the shelves, not only the books classified on the shelf.



Frescoes on Library wall at the university of Lome, Photo by weart'chitect



Frescoes on Library wall at the university of Lome, Photo by weart'chitect

### “ **Knowledge and duality...** ”

This work explores knowledge in its dualistic character both in the process of acquiring knowledge and in the use of knowledge.

On the first vertical panel is a woman who holds in her hand a book turned towards the one who contemplates her ... it represents the feminine ... The open and conciliatory aspect of the knowledge that by the instruction raises the people... above her head we can see a yellow light sign of awakening surrounded by the blue color sign of peace. The serene aspect of his face translates well to the aspect of the true knowledge that gives harmony and peace: all is One.

On the fourth panel, we see a man similar to a magician and a warrior, he symbolizes the masculine side of knowledge, it gives strength the power to dominate over nature and others. It symbolizes the elevating power of pure knowledge. The mouth of the man and his look seems luminous materializing the power of the word of the one in whom the spirit of knowledge lives. In his right hand, he holds a calabash containing fruits and books: Knowledge is the food of our spirit.

### “ **Knowledge = Freedom...** ”

What differentiates humans from animals is the fact of understanding the properties, characteristics and specific features of something: knowledge. Thus, the work, Knowledge Liberates, wants to advocate the virtues of knowledge as well as to make a point of honor to the pioneers who throughout the world have marked the literature with their knowledge. This universal knowledge there, which illuminates the center of the work and transmits this light to the rest of the work, the lambda individuals, assimilated to the anthropomorphic stylizations. The whole in the depth of the ebony shade.

For work, knowledge allows us to free ourselves from nature to dominate as established by God himself. In this era where it is easy to lose one's bearings, knowing becomes imperative.



## “ Association Sena Street Art (ASSART)... ”

Born from the idea of making art accessible to all through the promotion of urban culture; ASSART (Association Sena Street Art) is an association of young artists engaged in various respective fields such as: graffiti, plastic arts, music, dance, photography, video, and digital arts. Registered as a cultural association under number 2018/2518/DEP-LIT/SG/SAG-ASSOC of November 28, 2018 ASSART works for the initiation, awareness, and development of youth through art and culture.

ASSART fights for the influence of urban art in the public, institutional and cultural landscape of Benin through various initiatives; tours in different localities of Benin, awareness, initiation workshops, exhibitions, etc...

The artists go to meet the people of Benin to share their knowledge and awareness, beautify and clean up their living environment. Since 2013, ASSART has held several annual and periodic events including the festival Effet graff and art training for the youth and awareness campaigns.

Assart has initiated more than 8000 young people to drawing, urban art, photography, urban dance, including more than 2000 out of school and in reintegration.

ASSART also has about forty volunteers devoted to the cause and ideals of the Association.



## THE HERITAGE WALL BENIN

Produced as part of the festival effect graff organized by the Association Sena Sreet Art known by the acronym ASSART, the heritage wall is about the history of our beloved homeland Dahomey then and Benin now. The Heritage Wall relates the history of the peoples of Benin and Benin and brings out the perspectives.



The Heritage Wall Benin, Photo by MAGINE BENIN



“ Every African must be connected to his culture...” ”

Our message is that every worthy son and daughter must be connected with his or her culture and identity. We have very rich, dense, diversified, authentic, and accentuated cultures and values that unfortunately are forgotten or seem to be more and more relegated to second place by the young generation. This does not honor us as such. No one can tell our story better than us and in our place. It is a pure aberration to see our story told by others under other skies without telling it as it should be.

It is there that our works and graffiti make all the sense because they are realized in full cities and in direct contact with the populations. Our goal of making walls into open-air museums is only just beginning and we want to do more.



The Heritage Wall Benin, Photo by MAGINE BENIN



The Heritage Wall Benin, Photo by MAGINE BENIN



The Heritage Wall Benin, Photo by MAGINE BENIN

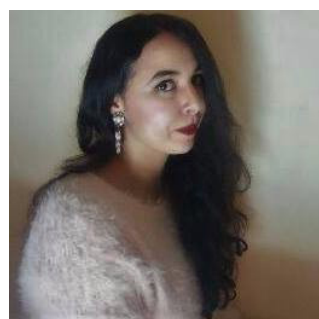


# AUTHORS



## Leandry JIEUTSA

Leandry is a Cameroonian urban planner with a major focus on promoting smart cities that build on the local context for people-centered smart cities. Amateur photographer and graphic designer in his spare time, he is passionate about innovative approaches to make cities inclusive and sustainable living spaces. It is in this sense that he initiated Africa Innovation Network in order to co-construct models of thought, paradigm and ideologies and know-how for African cities that place the human being at the center.



## Hind REZOUK

Hind is a Moroccan Architect, with a DPEA degree from the architecture and landscape school of Bordeaux, France. She's currently studying urban planning at the University of Paris Nanterre, and she is the Executive Secretary of Africa Innovation network. She is passionate about questions of sustainability, resilience, and the importance of the architectural /urban heritage in Africa, As well as participatory projects in urban design and architecture, where the people are the principal actors and the community organizers, serve as facilitators to develop local projects.



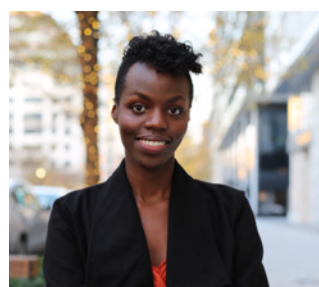
## Ayanda Roji

Ayanda Roji is a social scientist passionate about people-centred public and green spaces and her interests are focused on how these can be designed, redesigned and managed in ways that connect people from diverse backgrounds. She is a strong advocate of innovative practices that seek to include voices and ideas of vulnerable groups in shaping the spaces and communities they live in.



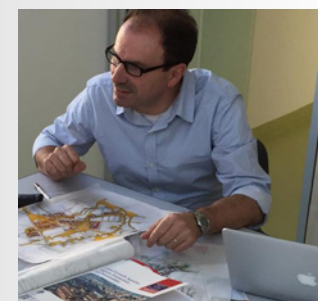
## Jean-Jacques Moukoko

Jean-Jacques is an infrastructure and energy specialist with a sound experience in both project and corporate finance in Africa and Europe, through significant experience in investment banking and development finance.



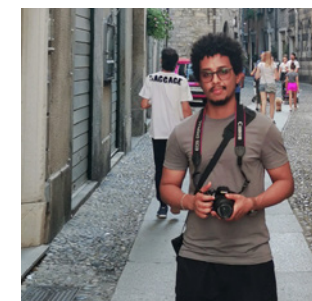
## Flavia Gwiza

Ms. Gwiza is a Rwandan Architect and urbanist with several years of experience within the country, the East African region and the Washington D.C. Metropolitan area. She is a Registered Architect in Rwanda, and holds a Master of Science in Architecture, concentration in Urban Design from Virginia Tech. Her experience includes architectural and urban design practice and the facilitation of participatory planning and design workshops.



## Professor Massimo Tadi

Director of IMM Design Lab and Associate professor at Department of ABC - Architecture Built Environment and Construction Engineering, Politecnico di Milano.



## Solomon Tamiru

Architectural Engineer, and MSc students' coordinator at Lecco campus, Department of ABC, Politecnico di Milano.



## Cédrix Tsambang, Tsambang Fansi

Driven by the desire to put resilience back at the center of decisions relating to the built environment, Sthève Cedrix TSAMBANG FOKOU is passionate about smooth transition toward a post-carbon world scenario. he is interested by circular & blue economy approaches, smart, affordable & growth booster green tools/stratégies. Sustainable innovation and green construction technologies specialist, he is Recognized as one of the emerging voices of African and global contemporary sustainable architecture.



## Christolle TSAMBANG

Christolle, architect specializing in Eco construction and Eco-management, militates for a contextualization of architectural approaches and for the return of the human in the urban. Convinced that there is no sustainability achievable in contemporary architecture without recourse to heritage, her work questions cultural heritage through her activity as a craftswoman and designer, and technology, in particular BIM and the sciences of material.



## Jurriaan van Stigt

Jurriaan van Stigt graduated with honours from the TU Delft in 1989. In that same year, he founded Loof & van Stigt Architecten in Amsterdam with Marianne Loof, which in 2005 continued as LEVS architecten together with Adriaan Mout. In 2021, Christiaan Schuit and Surya Steijlen joined as partners. For Jurriaan, the connection between creating, materialising and constructing, with and for people, is absolutely vital. He has a wide interest in the many aspects of social debate.



## Tea Kufrin

Tea is a designer at LEVS international with a strong interest in West African architecture, as well as contemporary urban and rural planning across the African continent. Already during her master studies she showed sensibility for this topic with the project "Positive slum: Social housing in Mekkele, Ethiopia" which gained a nomination for Dean's Award at University of Zagreb. In projects she seeks for a holistic approach and connection between architecture and other disciplines in order to achieve maximum impact.



## Danièle Diwouta Kotto

Architect D.P.L.G and Expert-Conseil, based in Douala, Cameroon. She is the founder and CEO of the Diwouta Architecture Firm. Trained at the School of Architecture of Nantes, Montpellier and Paris-Villemin, she is the author of the book Suites architecturales Kinshasa-Douala-Dakar, which relates her perspective on the evolution of historic centers of these cities.





### Franklin Yemeli

Franklin is a Cameroonian architecture student and winner of several international competitions and awards. He is deeply interested in resilience and how the spaces we live in can positively impact us. With a penchant for social architecture, humanitarianism and sustainable development, he believes strongly in the diversification of the role of the architect which will move more and more towards education, awareness and communication.



### Wijdane NADIFI

Wijdane is a Moroccan architect graduated from the Rabat's architecture school. She is currently specializing in Major Risks in ENSA Paris-Belleville, a field which allows to tackle architectural, urban and territorial issues related to natural and anthropic disasters/risks in a resilient and durable way. Wijdane has participated in Merit360's Action Plan 002 in 2017, and worked on several workshops aiming to design resilient projects (Lebanon and France), as well as competitions such as Heal+ and Kaira Looro.



### Yoel Mukalay,

Joel Mukalay, born in Likasi, D.C. Congo, and member of African Innovation Network (AIN) since 2020, is an architect at NAMS Birojs (Latvia), one of the leading design companies in Latvia founded in 1992 and specialized in design and project management, development of detailed plans and local plans, territorial planning, road design, transport solutions, landscaping, preparation of development proposals.



### Rajae HAISSOUSS

Rajae is a 22-year-old Moroccan architecture student from the National School of Architecture in Rabat, Morocco. In parallel with her studies, she discovered a whole other perspective of architecture from her volunteering work by joining and collaborating with youth-led organizations such as Africa Innovation Network. She defines herself as a young architect engaged to a global society believing in the power of architecture and urban planning as a medium of change in every society.

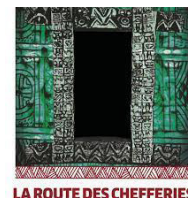


### Stephen SARFO

Stephen Sarfo has a degree in geography and masters in Town Planning. In his quest to contribute to solve global planning and development issues, He takes interest undertaking research to influence the sustainable planning policy formulation and development management. He also has the passion to support students learning and teaching in a way to explore innovative solutions for complex and wicked global challenges to achieve a more equitable and sustainable future for all.



African Art Awake  
rethinking Art and Design



# SOURCES AND REFERENCES

## CAPS: Public spaces as leverage for more inclusive and sustainable cities in Africa

- World Bank. 2018. World Development Report 2018: Overcoming Poverty and Inequality in South Africa: An Assessment of Drivers, Constraints and Opportunities. Washington, DC: World Bank.
- Toffa et al. 2021, forthcoming «Position paper on the status quo of African public spaces»
- Venter et al. 2020. Urban nature in a time of crisis: recreational use of green space increase during the COVID-19 outbreak in Oslo, Norway, Environmental Research Letters, 15:10, 104075.
- Bénit-Gbaffou (2018) Unpacking State Practices in City-Making, in Conversations with Ananya Roy, The Journal of Development Studies, 54:12, 2139-2148.
- Way et al. 2021. Quality of Life Survey III (2013/14). [online] Gauteng City-Region Observatory. Available at: <<https://gcro.ac.za/research/project/detail/indicators-and-benchmarks-2013/>> [Accessed 26 September 2021].
- Unhabitat.org. 2021. [online] Available at: <[https://unhabitat.org/sites/default/files/2020/07/city-wide\\_public\\_space\\_assessment\\_guide\\_0.pdf](https://unhabitat.org/sites/default/files/2020/07/city-wide_public_space_assessment_guide_0.pdf)> [Accessed 27 September 2021].
- Sdgs.un.org. 2021. THE 17 GOALS | Sustainable Development. [online] Available at: <<https://sdgs.un.org/goals>> [Accessed 26 September 2021].
- Au.int. 2021. Agenda 2063 | African Union. [online] Available at: <<https://au.int/en/agenda2063>> [Accessed 26 September 2021].
- Iudf.co.za. 2021. IUDF - Integrated Urban Development Framework. [online] Available at: <<https://iudf.co.za/>> [Accessed 26 September 2021].
- Urbanet. 2021. Towards Pan-African Spaces of Publics - Urbanet. [online] Available at: <<https://www.urbanet.info/towards-pan-african-spaces-of-public/>> [Accessed 27 September 2021].

## Governance's role towards resilience in Kigali

- Ministry of Finance and Economic Planning, Minecofin. (2000, July). Rwanda Vision 2020. Retrieved from <https://www.greengrowthknowledge.org/sites/default/files/downloads/policy-database/RWANDA%20Rwanda%20Vision%202020.pdf>.
- Ministry of Natural Resources, Minirena. (2012, December). Environment and Climate Change Sub-Sector Strategic Plan 2013/14 – 2017/2018. Retrieved from [https://rema.gov.rw/fileadmin/templates/Documents/rema\\_doc/Planing\\_Dpt/ECC%20SSP\\_December%20version.Final.pdf](https://rema.gov.rw/fileadmin/templates/Documents/rema_doc/Planing_Dpt/ECC%20SSP_December%20version.Final.pdf).
- Organisation for Economic Co-operation and Development, OECD. Resilient Cities. Retrieved from <https://www.oecd.org/cfe/regionaldevelopment/resilient-cities.htm>.
- Rwanda Development Board, RDB. (2021). Agriculture investment opportunities overview. Retrieved from <https://rdb.rw/investment-opportunities/agriculture/>.
- Habinshuti, J. (2021). Kigali Resilience Roadmap (document not released to the public yet).
- Ministry in charge of Emergency Management, Minema. (2021, January 22). Disaster Damages by Disaster Types (January-December 2020). Retrieved from [https://www.minema.gov.rw/fileadmin/user\\_upload/Minema/Publications/Reports/Disaster\\_Damages\\_January-December\\_2020.pdf](https://www.minema.gov.rw/fileadmin/user_upload/Minema/Publications/Reports/Disaster_Damages_January-December_2020.pdf).
- Rwanda Environment Management Authority, Rema. (2021). Green Amayaga, Forest Landscape Restoration in Rwanda's Amayaga Region. Retrieved from <https://www.rema.gov.rw/index.php?id=106>.
- Boniburini, I. (2018, July 11). IMBUGA CITY WALK - Master plan for the pedestrianization of Avenue 4 in Nyarugenge, Kigali, Rwanda. Retrieved from <https://www.researchgate.net/project/IMBUGA-CITY-WALK-Master-plan-for-the-pedestrianization-of-Avenue-4-in-Nyarugenge-Kigali-Rwanda>.
- Rwanda Green Fund, Fonerwa. (2019). Climate Resilient and Flood Proof Nyabugogo. Retrieved from <http://www.fonerwa.org/portfolio/climate-resilient-and-flood-proof-nyabugogo>.



- Dusabemungu, A, V. (2021, June 7). Rwanda aims to have 20% of all buses transition to electric by 2030. Retrieved from <https://gggi.org/rwanda-aims-to-have-20-of-all-buses-transition-to-electric-by-2030/>.
- Habinshuti, J. (2021). Kigali Resilience Roadmap (document not released to the public yet).
- Rwanda Green Fund, Fonerwa. (2019, December 06). Green City Kigali Overview Presentation. Retrieved from [http://www.fonerwa.org/sites/default/files/Green\\_City\\_Kigali\\_Overview\\_Presentation.pdf](http://www.fonerwa.org/sites/default/files/Green_City_Kigali_Overview_Presentation.pdf).
- Habinshuti, J. (2021). Kigali Resilience Roadmap (document not released to the public yet).

### SMART without SLUM, in Quelimane, Mozambique

- United Nations, Department of Economic and Social Affairs, Population Division 2019. World Urbanization Prospects: The 2018 Revision (ST/ESA/SER.A/420). New York: United Nations.
- These are Africa's fastest-growing cities – and they will make or break the continent. Available online <https://igarape.org.br/these-are-africas-fastest-growing-cities-and-theyll-make-or-break-the-continent/> (Accessed on 12 May 2021).
- Vahabzadeh Manesh S.; Tadi M. Integrated Modification Methodology (IMM) 2013. A phasing process for sustainable Urban Design Issue 73 of World Academy of Science, Engineering and Technology, ISSN 2010-376X, pp 1207-1213.
- United Nations, Department of Economic and Social Affairs, Population Division 2019. World Urbanization Prospects: The 2018 Revision (ST/ESA/SER.A/420). New York: United Nations.
- United Nations Human Settlements Programme (UN-Habitat), 2018. Working for a better urban future: Annual progress report 2018 ISBN: 978-92-1-131928-6
- Serena Chan. Complex Adaptive Systems (CAS) 2001. ESD.83 Research Seminar in Engineering Systems.
- Tadi M.; Zadeh M.H.; Biraghi C.A. The Integrated Modification Methodology. In: Environmental Performance and Social Inclusion in Informal Settlements 2020. Research for Development. Springer, Cham. [https://doi.org/10.1007/978-3-030-44352-8\\_2](https://doi.org/10.1007/978-3-030-44352-8_2)

### BIM APPROACHES FOR MORE SUSTAINABLE AFRICAN CITIES

- <https://www.linkedin.com/pulse/bim-journey-africa-onyema-udeze/>
- <https://www.youtube.com/watch?v=IFjD3NMv6Kw> 7 Principles for building better cities | Peter Calthorpe
- <https://unhabitat.org/the-state-of-african-cities-2018-the-geography-of-african-investment>
- <https://bimafrica.org/about>
- <https://www.leconomistemaghreb.in.com/2019/06/07/rwanda-construction-de-la-premiere-ville-verte-en-afrique-en-2020/> Rwanda : construction de la première ville verte en Afrique en 2020
- <https://bimharambee.africa/events/reimagining-the-way-cities-are-built-in-africa/>
- <https://www.autodesk.com/solutions/bim> Autodesk BIM for Infrastructure: Sustainable Cities
- <https://www.youtube.com/watch?v=m45SshJqOP4> How we design and build a smart city and nation | Cheong Koon Hean | TEDxSingapore
- <https://www.influencia.net/fr/actualites/tendance,innovations,akon-devoile-akon-city-ville-futuriste-digne-wakanda,10508.html> Akon dévoile « Akon City », une ville futuriste digne du Wakanda
- <https://www.abcdblog.fr/etude-inedit-bim-africa-met-a-disposition-le-premier-rapport-sur-le-bim-en-afrique-2020-en-francais-et-en-anglais/>
- <https://www.sciencedirect.com/science/article/pii/S2666165920300077>
- <https://www.mdpi.com/journal/buildings>
- <https://www.youtube.com/watch?v=itLUXZnLRn8> The next generation of African architects and designers | Christian Benimana
- <https://www.youtube.com/watch?v=yn5n3BTIM2I> World changers Center, low tech, bio mimicry, Cédrix & Christolle Tsambang Chorus Architecture
- <https://www.courrierinternational.com/article/vu-du-burkina-faso-cyclone-idai-lafrique-victime-du-rechauffement-climatique> Vu du Burkina Faso. Cyclone Idai : l'Afrique, victime du réchauffement climatique

### Innovation at the service of community projects in Africa

- <https://www.archdaily.com/433846/women-s-opportunity-center-sharon-davis-design>
- <https://sharondavisdesign.com/project/womens-opportunity-center-rwanda/>
- <http://www.uma-archdesign.com/primary-school-gando-burkina-faso-francis-kr>
- <https://www.kerearchitecture.com/work/building/gando-primary-school-extension>
- <https://www.tamassociati.org/portfolio/children-surgery/>
- <https://www.tribune.com/progettazione/architettura/2017/02/renzo-piano-tamassociati-ospedale-emergency-uganda/>
- <https://www.archdaily.com/920427/hikma-a-religious-and-secular-complex-atelier-masomi-plus-studio-chahar>
- <https://www.kerearchitecture.com/work/building/gando-primary-school-3>
- <http://www.ateliermasomi.com/dan-daji-mosque>
- <https://worldarchitecture.org/architecture-news/ecnmp/the-straw-bale-school-by-nuru-karim-in-malawi-east-africa.html>

### Innovative architecture projects

- <https://www.wallpaper.com/architecture/slak-education-campus-francis-kere-architecture-kenya>
- <https://www.arquine.com/campus-startup-lions/>
- <https://www.kerearchitecture.com/work/building/startup-lions-campus>

### African cultural heritage: influence of religion and beliefs in architecture

- [https://fr.wikipedia.org/wiki/Grande\\_Mosqu%C3%A9e\\_de\\_Djenn%C3%A9](https://fr.wikipedia.org/wiki/Grande_Mosqu%C3%A9e_de_Djenn%C3%A9)
- <https://www.lemoniteur.fr/article/la-grande-mosquee-de-djenne-colosse-d-argile.781219>
- <https://www.futura-sciences.com/maison/photos/batiment-architecture-monde-traditionnel-contemporain-583/batiment-grande-mosquee-djenne-terre-crue-mali-2228/>
- <https://www.globe-trotting.com/post/grande-mosquee-djenne-mali>
- [https://www.francetvinfo.fr/monde/afrique/mali/mali-la-grande-mosquee-de-djenne-se-refait-une-beaute-et-entre-dans-la-modernite\\_3420489.html](https://www.francetvinfo.fr/monde/afrique/mali/mali-la-grande-mosquee-de-djenne-se-refait-une-beaute-et-entre-dans-la-modernite_3420489.html)
- <https://www.youtube.com/watch?v=ihrLEegiuNA>
- <https://en.wikipedia.org/wiki/Osun-Osogbo>
- <https://fr.wikipedia.org/wiki/Osun-Oshogbo>
- [https://en.wikipedia.org/wiki/Osun\\_State](https://en.wikipedia.org/wiki/Osun_State)
- <https://whc.unesco.org/fr/list/1118/>
- [https://www.francetvinfo.fr/monde/afrique/nigeria/au-nigeria-la-foret-sacree-dosun-oshogbo-veneree-par-les-yorubas-a-survecu-au-temps\\_4004695.html](https://www.francetvinfo.fr/monde/afrique/nigeria/au-nigeria-la-foret-sacree-dosun-oshogbo-veneree-par-les-yorubas-a-survecu-au-temps_4004695.html)
- <http://pierre-guicheney.eklablog.com/la-dame-d-osogbo-p413708>
- <https://fr.wikipedia.org/wiki/Aksoum>
- [https://fr.wikipedia.org/wiki/Royaume\\_d%27Aksoum](https://fr.wikipedia.org/wiki/Royaume_d%27Aksoum)
- <https://whc.unesco.org/fr/list/15/>





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