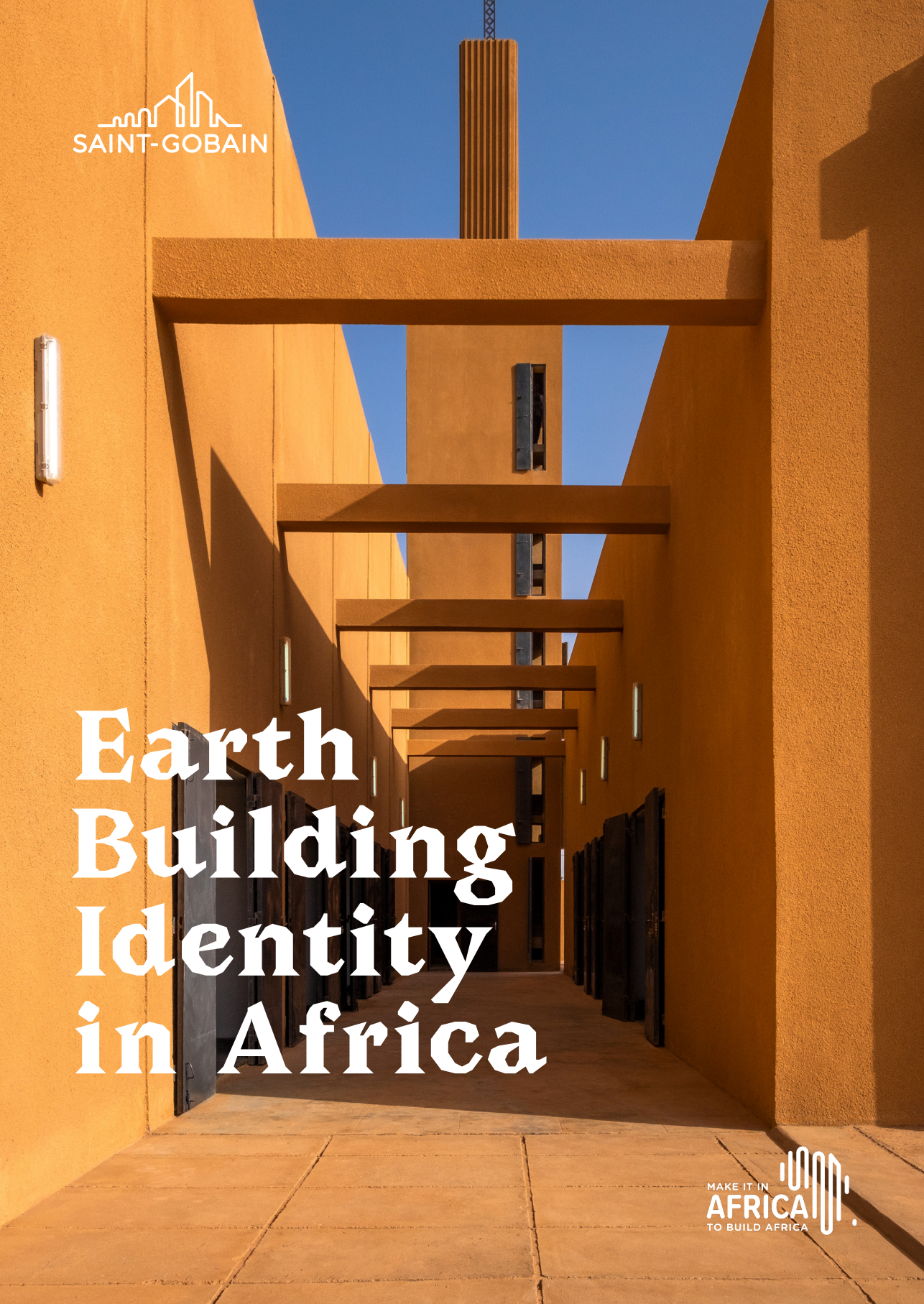
SAINT-GOBAIN
Earth Building Identity in Africa
MAKE IT IN AFRICA
TO BUILD AFRICA

SAINT-GOBAIN

MELISSA NSABIMANA

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This booklet has been carefully designed by the Saint-Gobain Research Paris design team, with particular attention to the architects who were interviewed, in order to faithfully convey their statements. The images have been credited with the mention of the author. However, if any error is noticed, it would be unintentional.

credits : cover
Mariam Issoufou architects
Kamara Esmaili Danjabi - Photo @James Wang

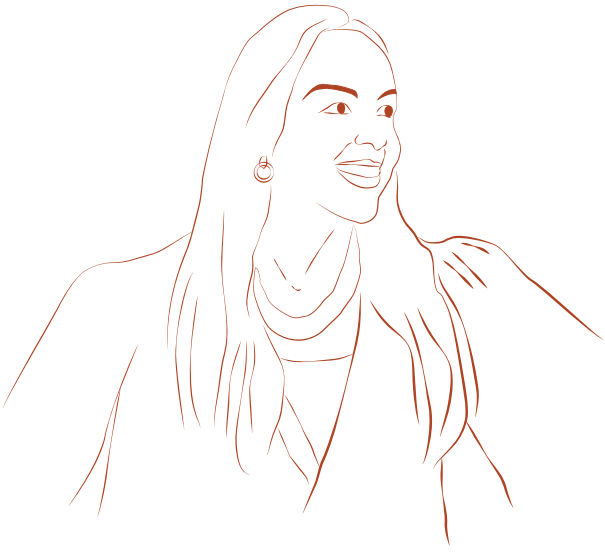
MAKE IT IN AFRICA
TO BUILD AFRICA

Earth Building Identity in Africa

Melissa Nsabimana

Marketing and Communications Director
Saint-Gobain Africa

«Earth Building Identity in Africa is born from a deep conviction: true innovation can only thrive when it is rooted in the recognition of our heritage.
We can only know where we are going if we understand where we come from.
Across Africa, a rich architectural legacy surrounds us…sometimes visible in the heart of our villages, often preserved through oral transmission, yet always carrying the wisdom of generations.
This booklet seeks to pay tribute to earth-based materials, pure and authentic, and to the ingenious practices that reflect a profound respect for the land and for human dignity. These constructions embody a way of building that is aligned with available resources, combining comfort, aesthetics, and harmony with the environment.
For us at Saint-Gobain, and for our broader ecosystem of architects and partners, this project is an invitation to rediscover, revalue, and reimagine this strong African identity. It is about learning from the past to innovate for the future…building with respect for materials, traditions, and people.
In that sense, this initiative is fully aligned with our commitment of “Make it in Africa to Build Africa”: creating sustainable, inclusive, and meaningful solutions by honoring the legacy and the resources that lie beneath our feet.»



1. Earth as a modern building material

 credits : Chadrac Agbodjogbe, Benin

10 *credits : Abre Crafford (bags filled in with earth)*

Earth has been the primary building material of our civilization for millennia. Despite our long history with it, in Africa, Europe, and other parts of the world, this material remains largely the domain of specialists.

Throughout history, the dissemination of earth construction techniques and properties across continents has faced many challenges, gradually relegating it to the status of an alternative material, often overlooked by the majority of the population and institutions.

Whether rejected, revered, ridiculed, or admired, earth elicits strong reactions. Often seen in Africa as «the material of the poor», it is not surprising that the transmission of knowledge regarding earth construction has been, and continues to be, a laborious process.

Today, in a context of significant ecological upheaval, interest in earth is growing, placing it at the forefront of current discussions in the building and research sectors.

The scarcity of materials and energy for construction, coupled with climate change, has triggered societal awareness regarding our current lifestyles. There is a questioning of traditional models, prompting a reevaluation of supply, production, and consumption methods. These essential elements of the current context elevate earth to the status of an innovative and promising building material.

It seems essential to re-examine this historical material and resonate it in this new context to identify potential innovative solutions.

This document provides a concise description of earth construction, illustrating its various application techniques and properties through examples of implementation in architectural projects. It has been drafted based on interviews with specialists: Saint-Gobain collaborators and external architects, in addition to the collection and analysis of articles from specialized magazines, videos, books...

The framework of this research is how earth construction is perceived and applied in Africa in the 2020s. The document's objective is to initiate a journey of reflections and debates around this building material in the perspective of the Saint-Gobain MABA commitment: «Make it in Africa, to Build Africa.»

Timeline of earthen architecture *in Africa*

popularity of earth construction level by Saint-Gobain Research design team

megalithic monuments

limstone mudbricks

negative carving methods

mudbricks buildings

cement techni from Europe

50,000 BCE
Evidence of open-air huts in Affad 23, Sudan – possibly the oldest known human-built shelters in Africa.

7500–4000 BCE
Nabta Playa, Egypt – megalithic monuments and cattle burial sites suggest early ceremonial architecture.

5000–2500 BCE
Tumuli and megalithic monuments emerge in the Saharan region of Niger, precursors to Egyptian mastabas and pyramids.

c. 3100–30 BCE
Ancient Egypt develops monumental stone architecture – pyramids, temples, and tombs using limestone and mudbrick.

c. 2500 BCE
Construction of the Great Pyramid of Giza, the largest mudbrick and stone structure of its time.

1000 BCE
Garamantes in Libya begin using mudbrick for settlements and tombs.

c. 1200 CE
Rock-hewn churches of Lalibela, Ethiopia – carved directly into volcanic rock, showcasing negative-carving

670 CE
Founding of the Great Mosque of Kairouan, Tunisia – prototype of Islamic architecture in Africa.

11th century
Kumbi Saleh, capital of the Ghana Empire, features multiple mosques built with earth materials.

13th century
Original construction of the Great Mosque of Djenné, Mali – largest mudbrick building in the world.

15th century
Flourishing of Sudano-Sahelian architecture in cities like Timbuktu, Gao, and Agadez.

Late 15th century
European influence begins along African coasts, introducing stone and cement techniques.

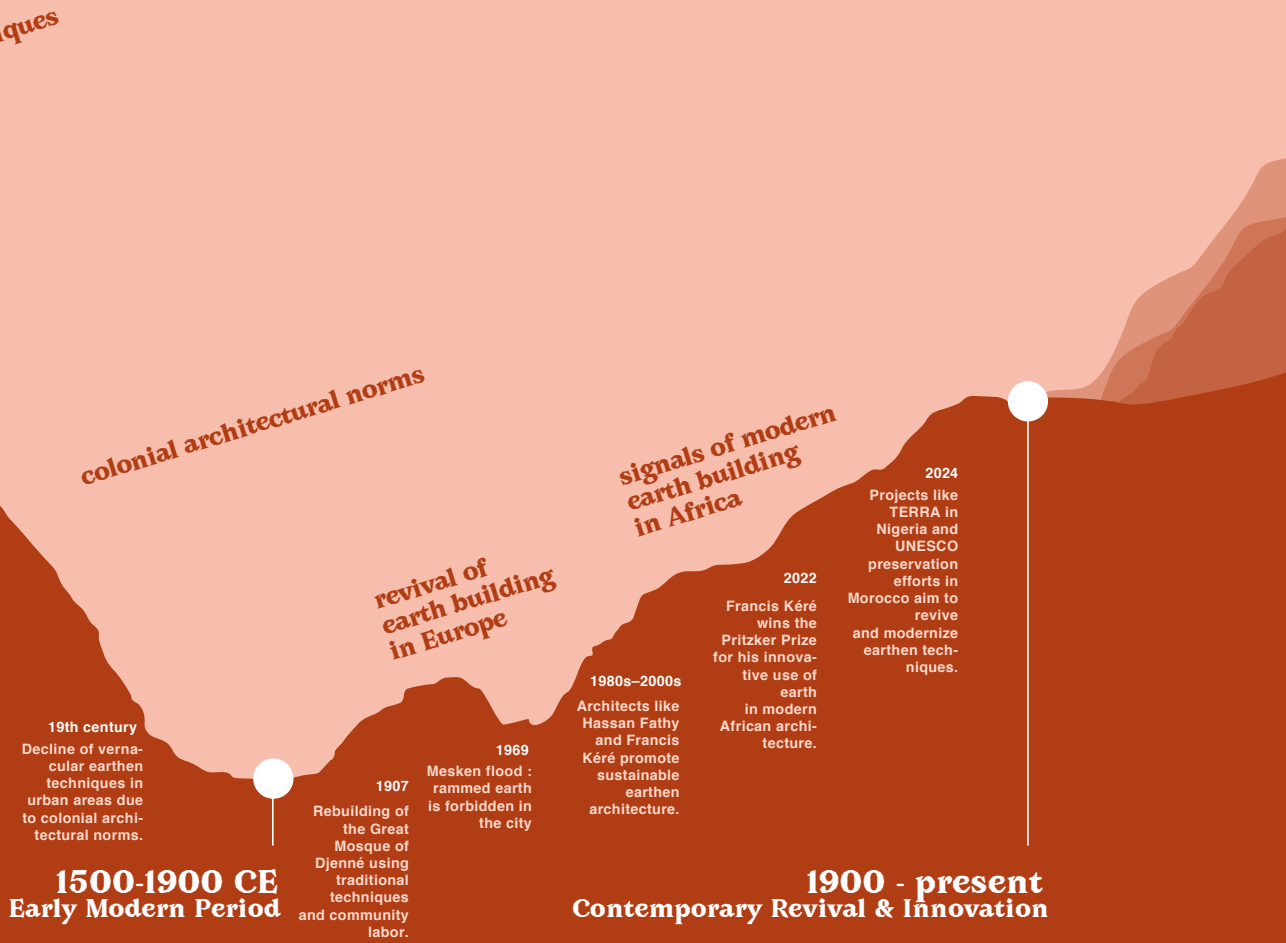
17th century
Construction of Aït Benhaddou, Morocco – fortified earthen village (ksar) using rammed earth and adobe.

before 3100 BCE
Prehistoric & Early Periods

3100 BCE -700 CE
Ancient Civilizations

700-1500 CE
Medieval Period

Colonial &


ques
colonial architectural norms
revival of earth building in Europe
signals of modern earth building in Africa
19th century
Decline of vernacular earthen techniques in urban areas due to colonial architectural norms.
1907
Rebuilding of the Great Mosque of Djenné using traditional techniques and community labor.
1969
Mesken flood : rammed earth is forbidden in the city
1980s–2000s
Architects like Hassan Fathy and Francis Kéré promote sustainable earthen architecture.
2022
Francis Kéré wins the Pritzker Prize for his innovative use of earth in modern African architecture.
2024
Projects like TERRA in Nigeria and UNESCO preservation efforts in Morocco aim to revive and modernize earthen techniques.
1500-1900 CE
Early Modern Period
1900 - present
Contemporary Revival & Innovation

Crédits : Salima Naji, Morocco

earth building material techniques

Clays are particles so small that they are impossible to discern with the naked eye or even under an optical microscope. They are hydrated phyllosilicates, derived from the Greek word meaning «leaf-like.» Under an electron microscope, they typically appear as platelets on the order of micrometers in size. These two characteristics, size and shape, are responsible for their high plasticity and strong cohesion.

The smaller the grains, the more water adheres to them. For example, a mound of fine sand is much more resistant than a mound of coarse sand. Why? The number of grains is much greater in the first case than in the second, and the water bridges between the grains are also more numerous. Thus, capillary forces increase as grain size decreases.

In the case of clay, the particles are much smaller, significantly increasing the number of water bridges. These forces become strong enough at the scale of clay platelets to allow for the construction of large structures. Water is the true binder of earth.

Why doesn't a rammed earth wall collapse when it dries, as a sandcastle does? Between sand grains, capillary bridges indeed evaporate after a certain time, affecting the cohesion of the whole. But at the nanometric scale of clay platelets, the rules are different. Water never completely evaporates, and sometimes the opposite occurs: the humidity in the air can condense between the clay platelets, forming microscopic capillary bridges of a few nanometers and covering the platelets with an even thinner film of water molecules. Many mineral substances spontaneously surround themselves with this type of film in a slightly humid atmosphere: this is the phenomenon of adsorption.

Thus, the humidity in the air is sufficient to ensure the cohesion of the clay platelets: simply bringing them closer together makes them adhere. Consequently, a rammed earth wall is never completely dry; it always contains a bit of water between the clay platelets. This water does not evaporate because it is in equilibrium with the water vapor present in the air.

sources :
amaco.net / techno-science.net / amaco.terra-award.org

«Living on Earth: The Art of Building with Raw Earth - Tradition, Modernity, and Future»
Jean Dethier
Flammarion Edition

raw earth

(Terre crue)

Technique

Vocation
To build with low carbon impact and as locally as possible, while taking advantage of the many properties of raw earth.

Method
Resources sourced from excavation or foundation spoil. Here are the different techniques used.

Cob wall
(Bauge)

In its simplest form, a cob wall is built by stacking malleable lumps of earth, much like modeling clay.

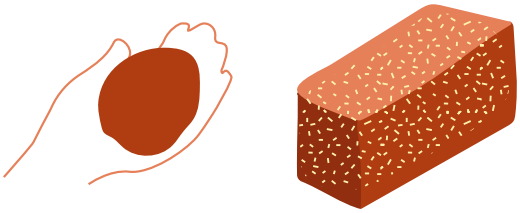
In most regions of the world, cob construction is shaped entirely by hand—like crafting a giant sculpture.

Adobe or Banco
(Adobe ou Banco)

It is undoubtedly one of the oldest building materials, and still widely used across four continents. It offers an affordable masonry solution, suitable for structures ranging from the simplest to the most complex—including vaults and domes.

The bricks are poured into an open frame, which is then removed. After a few hours, the bricks are turned on their side to complete the drying process. During drying, the bricks must be kept in the shade to prevent cracking.

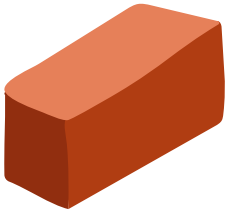
In West Africa, adobe is known as **banco**.



Compressed Earth Block (CEB)
(Brique de Terre Compressée, BTC)

Compressed Earth Blocks (CEBs), a kind of brick-shaped rammed earth, are produced using mechanical presses—manual, motorized, or hydraulic—that compress moist, powdery soil.

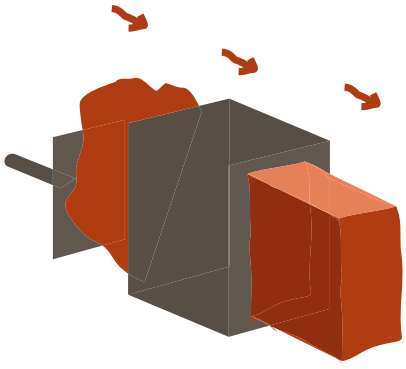
This modern technique, like adobe, offers the benefits of brick masonry. While using a press requires a greater investment, the resulting blocks can be stored immediately, unlike adobe bricks which must dry over large production areas before they can be handled.



Extruded Earth
(Terre extrudée)

Extruded earth refers to a technique where a plastic mixture of raw earth and water is shaped using an extrusion machine.

A material produced by extruding raw earth through a mechanized die. The resulting products often take the form of cut adobe bricks, coils, earth loaves, or panels. This process first emerged in 1924.



stabilized earth

(Terre stabilisée)

Technique

Purpose
To increase resistance to erosion and enhance durability.

Method
By adding various stabilizers—most commonly lime or cement—to raw earth, its texture and structure are modified.

This technique is a form of earth "solidification," achieved through a chemical curing process. For instance, stabilized Compressed Earth Blocks (CEBs) become Stabilized Compressed Earth Blocks (SCEBs).

Natural Stabilizers

Plant-based stabilizers (fibers, leaves, bark, fruits, seeds, oils, gums, waxes, etc.) and animal-derived ones (blood, excrement and urine, milk casein, hair and bristles, horse manure, etc.) can be used.

In most traditional practices, natural additives are primarily applied to coatings or surface protections. Their purpose is to enhance certain final properties of the material:

- Mechanical and abrasion resistance (to strengthen cohesion)

- Water protection (to preserve cohesion)

However, their main advantage lies in the fact that—except in cases of excessive fat content—these natural additives do not compromise the material's vapor permeability.

This permeability is crucial, as overly impermeable coatings can severely damage earthen structures. Water infiltration, rising damp, or even simple vapor migrating from the interior to the exterior of the building can cause such coatings to detach.

Examples of Traditional Recipes

- Acacia Pods + Limonite Stones
Dried acacia pods (rich in tannins) are boiled with limonite stones for 2 hours. The earth used for plastering must be mixed exclusively with this decoction. The result is a black-colored coating due to the formation of iron tannates. Although the color fades over time, the coating continues to protect the structure (see image below).

- Iron Gall Ink
Made since the Middle Ages from gallnuts (rich in tannins) and iron sulfate, this ink was the most widely used in Europe from the 12th to the 19th century. Its deep black tone and exceptional durability made it the preferred ink for manuscripts, official documents, and artworks. The ink is created by combining tannin-rich extracts (like crushed gallnuts) with ferrous sulfate and a binder such as gum arabic. Initially violet, it darkens over time as it oxidizes, becoming a rich black.

Stabilized Raw Earth Construction using Dung and Manure (Nubian Arch)

Sources :
https://www.techniques-ingenieur.fr/

Research Seminar Report (2016-2017)
– ENS «Natural Stabilization of Raw Earth» by Merniche S

Final Report of the PaTerre+ Project within the framework of the National Research Program on Knowledge and Conservation of Cultural Heritage Materials (2011) by Vissac A, Fontaine L, Anger R, Bourges A, Gandreau D

terra cotta

(Terre cuite)

Technique

Purpose
To increase the earth's resistance to erosion and improve its durability, while also facilitating transport and trade.

Method
A material made from clay mixed with sand and chemical additives, then molded, dried, and fired in a kiln.

Fired Clay Brick

Clay fired in a kiln, commonly used for producing bricks, roof tiles, ceramic ware, and decorative sculptures.

Fired clay brick is considered a stony material—non-flammable, incombustible, chemically inert, and highly resistant to compression, much like concrete. It has a density of approximately 18,000 kg/m³, yet remains fragile and porous. Paradoxically, this porosity allows it to bond effectively with mortar during construction.

Because brick walls are porous, they require treatment to protect against ground moisture, rain, and frost. Artificial bricks have been continuously optimized over time.

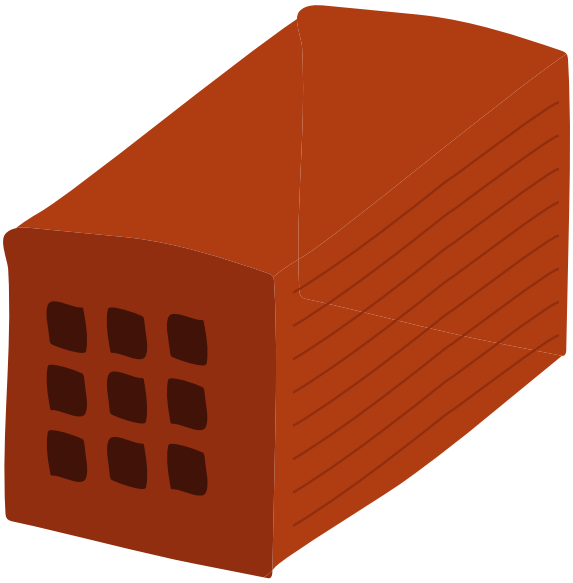
Fired clay bricks come in various formats and are increasingly used in construction to meet modern thermal regulations. Hollow bricks (or cellular bricks) help reduce heat transfer and lower the weight of building modules.

History

Fired clay brick experienced its full rise during the Industrial Revolution in the second half of the 18th century. Thanks to the technical innovations of the time, brick became one of the cheapest materials on the market.

Brickworks of that era expanded and evolved into full-scale factories.

Colonial America adopted it as a flagship material for its new settlements. Brick thus became a mass-produced product—a status it still holds today.



Sources :
editions-eyrolles.com/Dico-BTP/definition

«The Fired Clay Brick in Architecture: Structural and Aesthetic Performances, Ancient or New Symbolisms, and Prospective Potentials»
Master's Thesis, Sébastien Pardonnet - ENSAM

https://www.pmebtp.com/decouvrir-materiaux/5/les-materiaux-de-terre-cuite

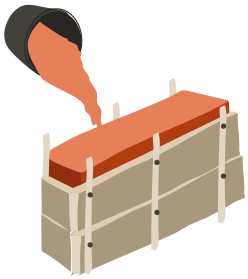
applications

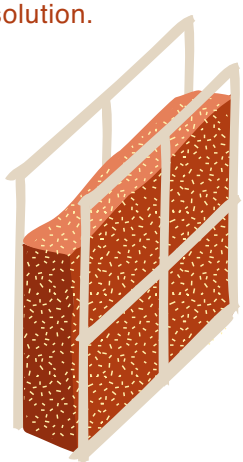
Rammed earth
(Pisé)

A method for building massive walls by compacting thin layers of moist, powdery earth inside formwork. The wall is unmolded immediately after the earth has been tamped. Once the formwork is removed, the wall reveals a unique texture and color that architects greatly appreciate—making additional plastering unnecessary. This technique allows for the use of soils containing gravel and stones. Austrian architect Martin Rauch, a pioneer in contemporary earthen architecture, developed prefabricated rammed earth: Facade elements are produced in series using a 50-meter-long formwork system.

Light earth
(Terre allégée)

A blend of rammed earth (compacted earth in formwork) and wattle and daub (earth-fiber mix used as non-load-bearing infill). This technique serves as thermal and acoustic insulation, though it is not load-bearing. It exists in many variations, combining earth with plant-based or mineral aggregates. Commonly used to fill the gaps in timber-frame structures, with a thickness of 20–25 cm for non-load-bearing walls, and 30–40 cm for load-bearing walls. This approach merges the structural integrity of rammed earth with the insulating properties of fiber-rich mixes, offering a sustainable and versatile solution.





Source :
https://www.espazium.ch/fr/actualites/et-si-coulait-de-la-terre-comme-du-beton
From the interview with Alia Bengana, DPLG architect, teacher at the ALICE laboratory of EPFL and at HEIA-FR.

https://www.topophile.net
https://amaco.terra-award.org/

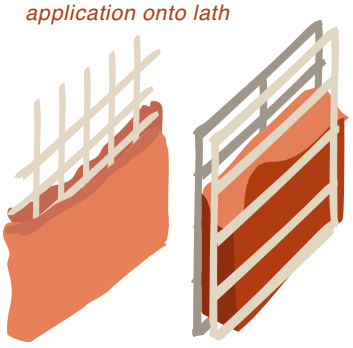
TerraFibra, Edited by Dominique Gauzin-Müller, architect-researcher & Aurélie Vissac, engineer at amàco
Éditions du Pavillon de l'Arsenal, November 2021

Watten & daub
(Torchis)

Wattle and daub is a method of applying clay-rich earth onto a timber framework. The earth is mixed with plant fibers to reduce cracking caused by clay shrinkage during drying.

Today, this material—earth lightened with natural fibers—is experiencing a renewed interest as a base for developing new insulating materials

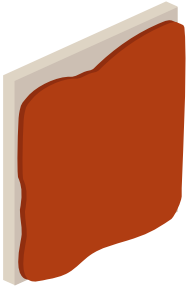
Manual or spray application onto lath



Earth plaster/ Earth render
(Enduit)

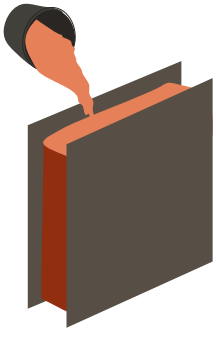
Earth plaster mortars made from naturally colored clay and graded sand offer an endless variety of decorative finishes by playing with flatness, texture, and color. These plasters aren't limited to earthen walls—clay is a versatile binder that adheres to many types of surfaces.

They are easy to maintain and repair using just a sponge and water.



Cast earth
(Terre coulée)

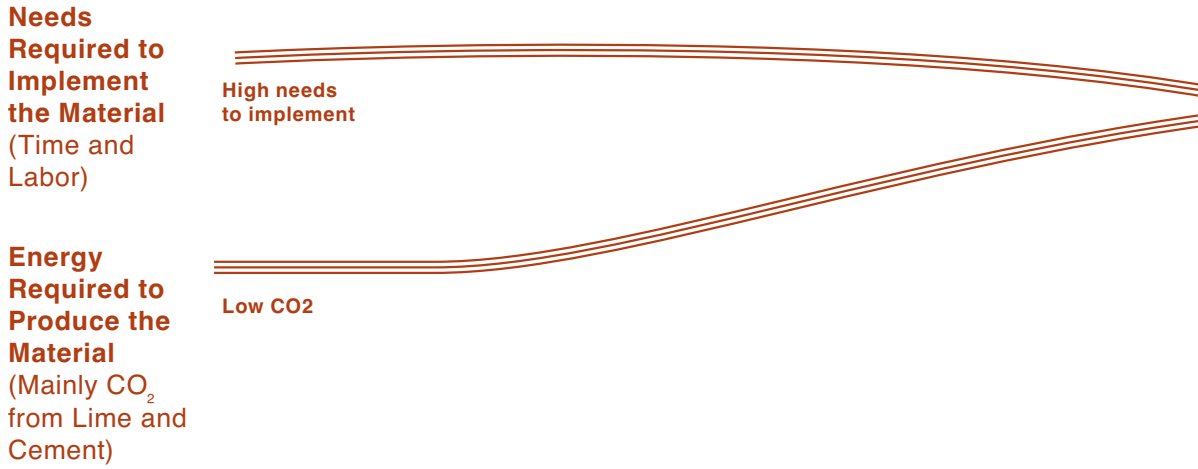
Also referred to as site-cast earth or earth concrete, this technique is above all a simplified, reproducible construction method. It first emerged in the early 1990s. Ideally, the soil used contains a natural and balanced mix of sand, gravel, and fine clay particles. If the site's soil is not well-balanced, it can be reformulated by adding sand, gravel, or other components. The cement does not contribute to the mechanical integrity of the poured earth.
The liquid earth is poured into concrete formwork, and the walls are unmolded after five days. They are then cured like traditional concrete partition walls. Finally, the walls are compressed using threaded steel rods that connect the foundation footing to the horizontal reinforcement at the top of the wall.



Comparison of Earth-Based Construction Techniques

Source :
Design & User Experience team - 2023 work
Saint-Gobain Research Paris

	Raw Earth	Stabilized Earth	Cast Earth *from raw earth or from stabilized earth*
Craftmanship practices	Earth containing **less than 1% binder,** whether lime or cement (based on the total dry mass used). This type of earth construction emphasizes natural cohesion through the clay content, avoiding reliance on industrial additives.	Stabilized earth refers to soil that has been made more durable and water-resistant by **adding more than 1% binder**—typically lime or cement, calculated as a percentage of the total dry mass used.	Earth **fluid enough to be poured between watertight formworks and cast** without compaction, like conventional cement concrete.



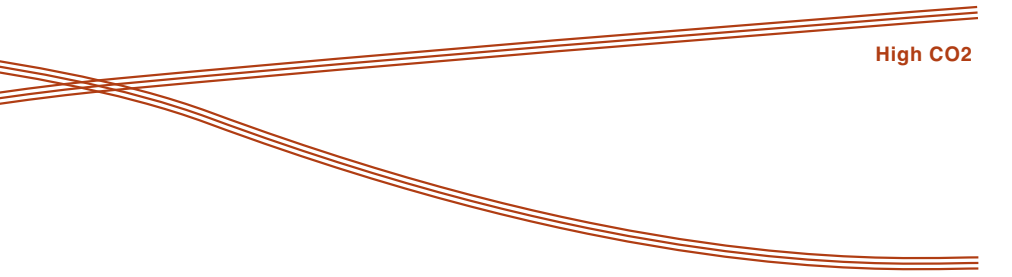
Low CO2 cement «earth concrete»

It is agreed that these concretes correspond to concretes which, for properties, performance, usability, and durability equivalent to those of a reference concrete, **generate lower greenhouse gas emissions** than the latter.

Concrete

Industrial practices

Concrete is a construction material composed of a mixture of **aggregates, sand, and water, bound together by a hydraulic binder**—most commonly cement—which acts as a ‘glue’.



properties

Source :
Design & User Experience team - 2023 work
Saint-Gobain Research Paris

Raw earth

Pourred Earth

Hygrometry regulation





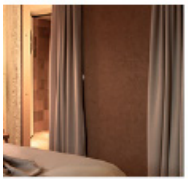

Thermal comfort



Shading



Ornemental



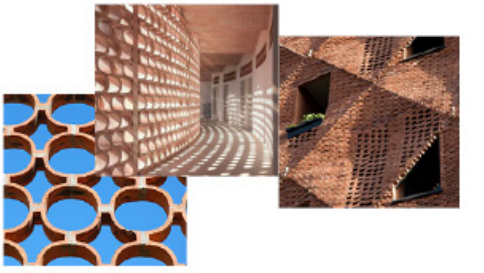

Sensory




Stabilized Earth

Terra Cotta

P55



2. Earth for climate-responsive architecture

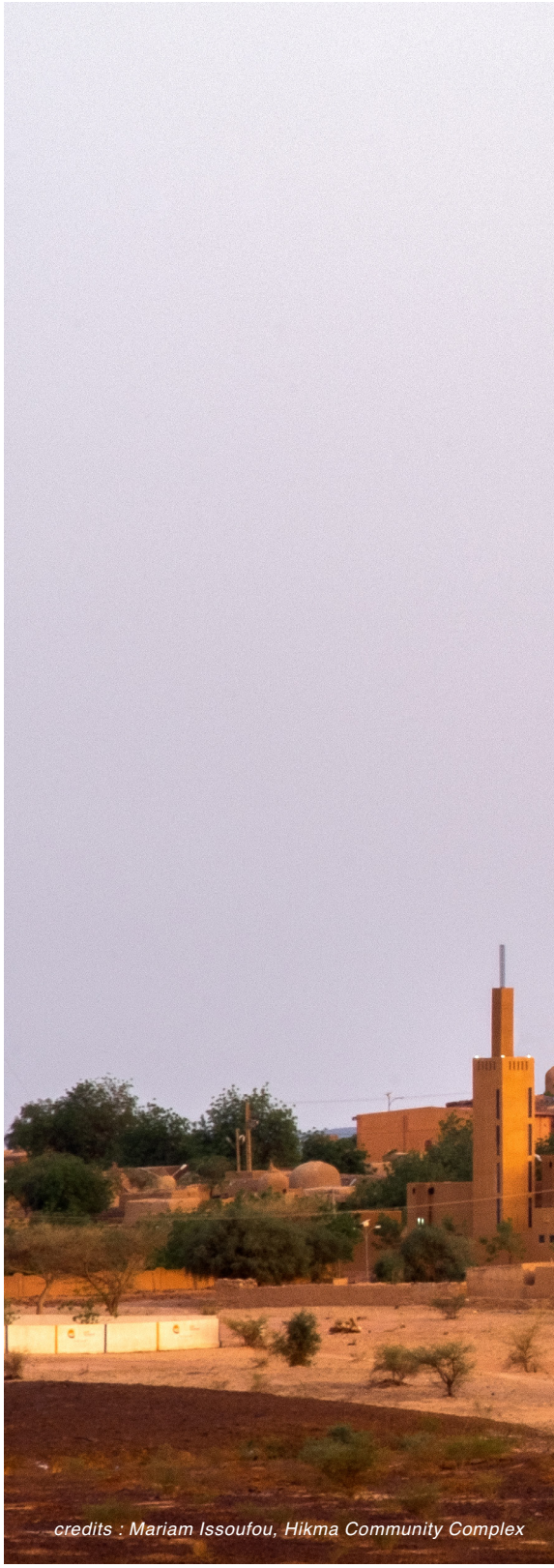
Earth as a building material is still regarded as a traditional resource by the majority of stakeholders in the construction industry. However, it is being reevaluated by some architects, workers, and residents for its ecological value, thermal performance, and technical versatility, particularly in Africa, where climate-sensitive architecture is a necessity.

Earth is more than just soil; it is a regenerative building material. It is abundant, locally available, and requires minimal energy for processing. These qualities make it a cornerstone of circular construction, where buildings can be repaired, reused, or even returned to the earth.

Earth walls, with their high thermal inertia, naturally regulate indoor temperature and humidity. This ability to «breathe» helps limit the need for air conditioning, a crucial issue in regions where energy is expensive or scarce. This bioclimatic quality aligns with the recommendations of the EAMAU (African School of Architecture and Urbanism) and UN-Habitat, which see the valorization of local materials as key to resilient and inclusive African cities.

In urban areas increasingly subjected to heatwaves, earth can create cool islands. It promotes natural ventilation, reduces heat islands, and integrates into sponge city strategies or green and blue frameworks, as demonstrated by the work of the Hydrology, Meteorology, and Complexity laboratory at the École des Ponts et Chaussées.

On the African continent, where the effects of climate change are already visible, bioclimatic architecture is becoming a necessity. Architects like Francis Diébédo Kéré in Burkina Faso and Mariam Sy in Mali are reinventing the use of raw earth by combining it with contemporary forms and modern comfort requirements. The



credits : Mariam Issoufou, Hikma Community Complex

Schorge High School in Koudougou and the Hikma Community Complex of Mariam Issoufou, from Niger, and her collaborators illustrate this fusion of tradition and innovation. These projects demonstrate that earth is not a material of the past but a material of the future: it is local, recyclable, low-energy, and perfectly suited to tropical and Sahelian climates. It allows for the construction of buildings that consume little, breathe well, and harmoniously integrate into their environment. Initiatives like Elementerre in Senegal show that it is possible to structure local production chains for «ready-to-use» ecological materials: raw earth bricks, insulating panels made from bulrush, and plant-based blocks.

These materials offer superior thermal comfort compared to concrete while being accessible and reproducible on a large scale. From acacia and cob to compressed earth blocks, rammed earth, and earth plasters, earth construction techniques are as varied as the cultures that use them. This diversity allows for contextual adaptation, enabling architects and builders to respond to local needs, resources, and traditions.
Eco-construction thus becomes a lever for sustainable development, creating jobs and fostering a solidarity-based vision of housing. It addresses the challenges of rapid urbanization in Africa while reducing the carbon footprint of the construction sector.

Finally, the use of earth in architecture is also a social response. Air conditioning, often inaccessible to the less fortunate, becomes a revealing factor of inequality. Offering well-designed earth buildings guarantees a «right to cool» for all, as suggested by reflections on public adaptation policies. It also rehabilitates ancestral know-how, imbued with meaning and dignity, in a process of decolonizing architectural imaginations.

34 credits : pexel - @mgshotz - Nigeria

Despite its promises, earth presents technical challenges. Its variability, even within the same site, complicates standardization and requires specific site testing and adaptation.

To address this, builders are exploring stabilization techniques using materials like cement, lime, and stone. These hybrid approaches raise important questions about authenticity and ecological performance, but they also open doors to innovation. Emerging solutions range from low-tech methods, such as hand-molded bricks, to high-tech systems like prefabricated stabilized earth blocks, mobile factories, and advanced mixing tools. These innovations contribute to scaling up earth construction while preserving its ecological integrity.

By embracing earth, humans can reconnect with local traditions, natural cycles, and innovative practices.

The architects and builders leading this movement are not just preserving heritage; they are shaping a future where construction is in harmony with the planet and its people.

Photo : Maison Rauch, Martin Rauch et Roger Boltshauser © Beat Bühler

Martin Rauch (contemporary Austrian architect) created prefabricated rammed earth: The facade elements are prefabricated in series in a formwork that is 50 meters long.

Some of the african architects that we have interviewed have mentioned his work to gain credibility when presenting earth based materials for construction in Africa.

Photos : Maison Rauch, Martin Rauch et Roger Boltshauser © Beat Bühler

4. Building with earth : a silent revolution in Africa

An ancestral material at the heart of contemporary issues

Earth is the primary building material of our civilization. Yet, in Africa and elsewhere, it remains largely unknown, marginalized, and often relegated to the status of a «poor man's material.» This perception, inherited from colonial history and modernization dynamics, has long hindered its use in urban and institutional projects. However, a fundamental movement is underway to reverse this trend.

Some architects, artisans, and researchers are reinvesting in earth as a local, sustainable, and culturally significant resource. They are not just building; they are reconstructing imaginations. By valuing vernacular know-how and hybridizing it with contemporary techniques—such as prefabricated rammed earth—they are restoring this material's place in the narrative of progress. Thus, earth embodies a material that has withstood the test of time, carrying the weight of cultural heritage. The creation of museums and educational spaces dedicated to earth construction reflects this conviction, highlighting the beauty and importance of this material.

A political and logical material

Building with earth is also an act of resistance. It is a rejection of the industrial standards imposed by Western models and an affirmation of an alternative vision of development: slower, more local, and more inclusive. In many African regions, earth buildings are not just functional; they embody a collective memory, an intimate relationship with the environment, and a unique aesthetic.

However, this rehabilitation does not come without tensions. The aspirations of residents are evolving; modernity is often sought, even if it contradicts ecological or economic principles. Some architects, like

credit : pexels-@muhammad-shehu-1718177362-31979098 - Arewa, Nigeria

Mariam Issoufou, an architect from Niger, adopt a universalist stance, preferring not to burden earth with a strong cultural identity. For them, earth is a logical material, suited to its context, but not necessarily carrying an ideological message.

Symbolism, spirituality, and transmission

Earth is not limited to its physical properties. It is also a vector of spirituality and immaterial connection. Chadrac Agbodjogbe, a Beninese architect and researcher, emphasizes the importance of integrating spiritual dimensions into architecture. For him, building with earth is also about honoring cultural practices, lifestyles, and African rituals. He advocates for architecture that enhances people's lives while respecting their environment and culture.
This approach aligns African environmental philosophies like Ubuntu that extends to one's natural environment. It values local materials not only for their durability but also for their ability to connect humans to their territory.

Avoiding greenwashing and adovating for authenticity

The renewed interest in earth is set against a backdrop of ecological crisis and the search for low-carbon solutions. However, this trend is also accompanied by pitfalls. Some projects label stabilized materials as «sustainable» without transparency regarding their composition. Advocating for authentic earth construction also means demanding clear and specific standards, rigorous certifications, and traceability of materials. It is a refusal of greenwashing and a defense of an ethical approach to architecture.

credits : Dandaji Market - Mariam Issoufou Architects - @ Maurice Ascani

Towards an architecture of emancipation

Beyond technical considerations, earth serves as a vector for empowerment. It enables the mobilization of local resources, the training of artisans, the transmission of know-how and the creation of jobs. It fosters a circular economy and community ownership of built environments. This architecture of emancipation stands in opposition to the extractivist logic of conventionnal industrial materials. It proposes a different way of making cities, societies, and cultures.

The architects leading this charge are not merely constructing buildings; they are reshaping narratives and redefining what it means to build with earth in the modern world.

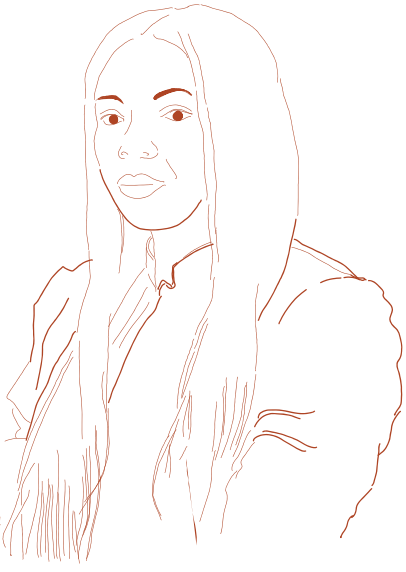
Discover eight of them who share their stories and valuable insights for Saint-Gobain.

Interview with **Mariam Issoufou** architect

«I come from a country where climate change is visible to the naked eye. [...] It is urgent to take bio-based materials seriously.»

How did you start working with earth as a building material?

My first earth project took place in an urban area, in Niamey, the capital of Niger. There, earth is perceived as a poor, rural material, with no place in urban contexts. It took me two years of discussions with investors to convince them. It wasn't easy. I had to prove that earth could be strong, durable, and economically viable. It was essential for these projects to fit into an urban context to help destigmatize the material. Ironically, I had to show European examples, particularly from Germany, to reassure them. There is a strong psychological dimension, a sort of inferiority complex that drives people to seek references elsewhere. What really helped was the economic aspect: we demonstrated that the structural work cost about 30% less.



Do you still use local earth?

Always. For me, building with earth is not an ideological stance; it's common sense. If good quality earth is available locally, it should be used. This also helps reduce costs and environmental impact. It's not about building with earth just for the principle, but because it's the most logical material in a given context. However, we need to prove that compressed earth blocks are reliable. Unfired earth bricks require annual maintenance, which is difficult to accept nowadays. So, we opted for stabilized laterite bricks with 5 to 7% cement. This mixture offers remarkable durability. At 5%, the brick becomes almost like stone after two years. We conduct compression tests in the lab for each batch. Technicians are often surprised: our bricks are sometimes stronger than cement.

How do your clients react to the idea of building with earth?

Some change their minds along the way. One client, initially opposed to the idea, eventually asked if her office building could be constructed with earth. This five-story project, located on a major avenue in Niamey, is almost finished. What convinced her was the energy savings. Electricity is expensive in Niger, and earth helps maintain a comfortable indoor temperature. Other clients, on the contrary, start out enthusiastic but then become fearful. In one case, we

credits : Hikma Community Complex
Mariam Issoufou architects, co-designed
with architect Yasaman Esmaili of Studio Chahar

proposed a hybrid wall: cement on the outside, earth on the inside.

What is your approach to the identity of the material?

I am careful not to attach too strong an identity to any material. Earth has become an identity marker because it has significance in certain geographical areas, not because it has intrinsic cultural value. I prefer to separate the material from identity. It's a matter of logic and practice. I work with the color and texture of local earth, without trying to impose my aesthetic preferences. Each project is a discovery.

Do you have a memorable anecdote from a construction site?

The Dandaji project! It was quite an adventure, as we designed enormous domes, much larger than normal domes. It was a mixed system, with a concrete frame to support the domes and earth walls. However, we struggled to properly fabricate the domes. We had a contractor from the city who made molds for the domes. Once we removed the molds, we found that the workers had left many small defects. At that moment, I thought the project was compromised, as we couldn't achieve the expected result despite several attempts.

In the meantime, we were renovating the old mosque next door, and we brought in masons who had worked on the previous project, as well as masons from the city of Agadez. The latter had been trained by an NGO in the 1980s, not only on the idea of compressed bricks but also on using natural additives in the clay to plasticize it and make it more durable.

credits : Issoufou Esmaili Hikma Community Complex Complex @JamesWang

One day, someone came to ask if we needed help making the dome. I replied that yes, of course, I can demonstrate it if you want; there's no problem. He went to gather all his friends, and we had to bring in masons from four different villages. These masons lived in the village where they were building for three months to create all these domes. The result was astonishingly perfect, done entirely by hand, without any technical instruments. It was truly one of my favorite experiences. For me, it showed that we sometimes cling too much to technology. While technology has its place and is important, it is essential to benefit from it without making it a systematic necessity for all projects.

What is your vision for the future of earth construction?

I come from a country where climate change is visible to the naked eye. We already have climate refugees. It is urgent to take bio-based materials seriously. Earth is the most abundant material on the planet, and it is an easy solution. I believe in a hyper-local approach, adapted to available resources. Transporting materials over long distances no longer makes sense. We see the world as a vast space where materials can come from China, Morocco, Italy, and it is considered normal. I don't think that's normal at all. Not to mention all the pollution caused by transportation, etc.

What role can industrial players like Saint-Gobain play?

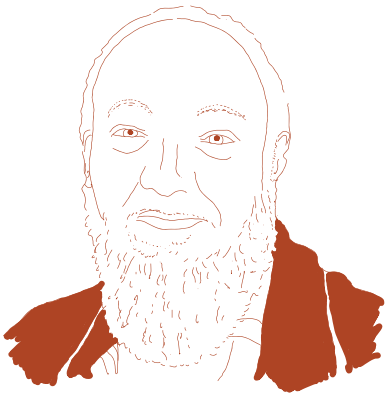
A huge role. We need to think about the mass production of earth materials, but in a way that respects local traditions. Industrial production reassures clients and allows for regional or global impact. Innovation is not about adapting earth to industrial standards, but about adapting industry to the traditions of earth. Working with earth requires patience, conviction, and a willingness to challenge norms. It's not just technical; it's cultural, ecological, and deeply human. It's a long road, but it's the right one.

Interview with
Abre Crafford
architect

«Building with earth means not taking more than necessary and reusing what the site offers us»

What role does nature play in your thinking as an architect?

For me, nature is not an external framework to humanity; it is our original environment, and we are part of it. Humanity's mistake has been to believe it could dominate or improve nature. We are one element among many, and architecture must be part of this continuity.
I have been greatly influenced by my mother, a Grand Master in Ikebana, and by Eastern philosophy, which considers that energy and life exists everywhere in nature. This has taught me to respect the natural balance and seek harmony with the environment in my projects.



How does this vision translate into your earth construction projects?

Building with earth is precisely what nature provides, without excess. We use the earth, stones, and wood from the site, and we reuse what is extracted during the foundations. It's about not taking more than necessary and allowing wildlife and flora to coexist with the buildings. For example, I ensure that insects and small animals can continue to live in the stone basement walls. Sustainability also means not breaking natural cycles.
Clay is a common material available on most sites. It is a valuable local resource, available everywhere, and has been used to build villages and cities for millennia. What interests me is the ability of earth to integrate into its environment and respect nature by returning to soil if left to return to nature. Building with earth means not taking more than necessary and reusing what the site offers us, such as stones extracted from the foundations.
It's a process of respect and circularity.
In South Africa, there is an entire informal system for waste repurposing. What some consider waste becomes a resource for others, especially in construction.
We need to draw inspiration from this collective intelligence, limit waste on construction sites, and promote the reuse of materials. What we consider waste can become a resource again.

How do you reconcile tradition and modernity in your projects?

I always start by observing what the locals do: what forms of roofs, what materials, what tricks to adapt to the climate. Traditional techniques, such as adobe or wattle and daub walls, are often very effective. But we also need to respond to modern aspirations: some want flat roofs, large living rooms, carports...
My role is to propose alter-

natives, explain the benefits of traditional solutions, but also respect people's choices.

What is the social impact of this approach?

It is fundamental. Building with earth also means creating local jobs, involving communities, and promoting skills. In some projects, half of the workforce had to be unskilled, female, or disabled. This forces us to rethink site organization and rely on local human resources. It is an inclusive approach.
Earth construction requires regular maintenance. The advantage is that this maintenance can be done by the residents themselves, without relying on external companies.
I am also experimenting with earth-cement or earth-lime mixes to improve water resistance while keeping a low carbon footprint. The important thing is that the construction remains accessible, repairable, and adaptable to site and climate.

Does this philosophy also influence your relationship with modernity and innovation?

Absolutely. I am not against innovation; on the contrary, but it must be in harmony with living things. I experiment with earth-cement mixes, integrate plant fibers, but always with the idea of preserving the natural balance. Architecture must remain a continuous learning process, a search for harmony between humanity, technology, and nature.

Any advice for industries who wish to support more sustainable construction?

Be open to innovations, even if they do not immediately fit your business model. Engage with local artisans and entrepreneurs, experiment with new combinations, and combine traditional materials with modern innovations. And above all, never lose sight of humanity and nature in your projects. Innovation should not be against nature, but with it.

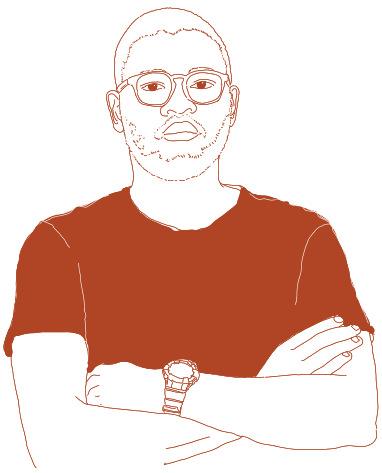
credits : Abre Crafford

Interview with
Chadrac Agbodjogbe
also know as "Omon Abule Sowo"
architect

«It is about deconstructing these preconceived ideas»

Can you introduce yourself and tell us about your background?

I am an architect, founder of Abule Sowo architecture studio, and a researcher affiliated with Résimva (International Scientific Network for African Urban Professions). I am based in Ghana and Benin. My work consists of creating living spaces with bio-sourced materials and developing digital solutions such as African Home, a chatbot dedicated to architectural education for Africans. I am passionate about African architecture and the valorization of local materials.



What values drive you as an architect?

I place great importance on cultural adaptability and sustainability. Architecture must adapt to the climate and local practices, such as the African way of life or African Kitchen. I believe that architecture should enhance the lives of its inhabitants by integrating spiritual and immaterial aspects. For example, the traditional practices of African masons, who place elements or objects in the foundations to ensure the durability and conviviality of buildings, are essential to me. These are often ritual gestures meant to protect the building. These practices are linked to the spiritual sensitivity of African architecture, where the living space is considered to carry positive vibrations, and architecture encompasses not only the material aspect but also the immaterial.

In your projects, how do you address climate and energy issues?

The climate question is at the heart of my architectural approach. In Africa, the climate imposes specific constraints: heat, humidity, and limited energy availability. For me, it is essential that architecture responds to these realities without systematically relying to energy-intensive solutions like air conditioning. Designing buildings that remain comfortable without relying on air conditioning is a major responsibility for African architects. I emphasize the use of local materials and traditional techniques, such as earth, stone, bamboo, or wood. These materials are suited to the climate and allow for the construction of naturally cool, bright, and healthy spaces. For example, the thickness of earth or rammed earth walls provides sound insulation, excellent thermal inertia, reducing the need for air conditioning. I also encourage the creation of vegetable gardens and the integration of mosquito repelling plants to improve quality of life while respecting the environment.

credits : Chadrac Agbodjogbe

Can you detail the traditional techniques you use?

I start each project with a thorough analysis of the environment and the materials available around the site. I use various earth construction techniques: rammed earth,stone wall, adobe, and compressed earth blocks (CEB), as well as clay plaster with natural pigments. I also incorporate bamboo, wood, and plant fibers like palm fronds, and for flooring, I use local stone or terrazzo. These techniques allow for the creation of authentic, durable spaces that are suited to daily use. I collaborate with local artisans, who possess skills that are sometimes at risk of disappearing, and I adapt each project to the client's lifestyle.

How do you raise awareness among your clients about these issues?

Many clients have an imagination influenced by Western architecture, where concrete and air conditioning are the norm. It is about deconstructing these preconceived ideas and showing that there are alternatives that are more suited to the African context. Education is a crucial lever for evolving practices and reducing the carbon footprint of the sector.

Are traditional techniques still mastered by artisans?

Traditional techniques are in decline, but there are passionate individuals. We need to organize ourselves into networks, share our knowledge, and train local artisans. Documentation and transmission are crucial for preserving this knowledge. I write many articles and am launching a newsletter call "Good to know about african architecture" to raise awareness and share my experience.

credits : Chadrac Agbodjogbe

What is your vision for the future of sustainable architecture in Africa?

Buildings and spaces made from bio-based materials, trams for public transport, electric bicycles, pedestrian walkways, green spaces, sponge pavements and roads to prevent flooding.

Africa will experience significant population growth, so it is essential to develop sustainable and appropriate alternatives.
We need to make materials suitable for the tropical climate accessible and support professionals with solutions that address local issues, such as humidity or roof waterproofing.

What role for industrial players like Saint-Gobain?

Large companies can play a key role in supporting the production and distribution of sustainable materials and in training local artisans in techniques suited to the African climate.
I wish to collaborate with players like Saint-Gobain to promote initiatives such as bamboo planting and training local artisans

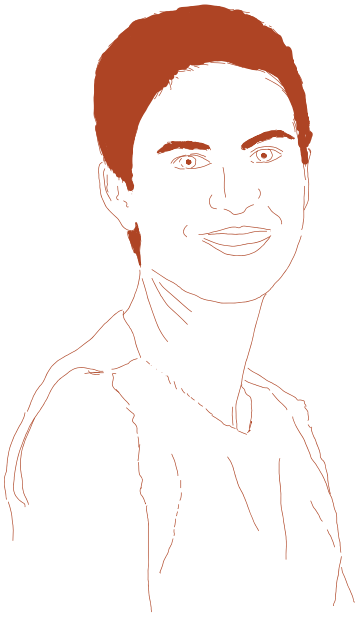
credits : Chadrac Agbodjogbe

Interview with **Anna Heringer** architect

«Earth is a champion of regenerative and ecological building materials.»

Could you introduce yourself?

I am an architect and also an honorary UNESCO professor for Earth and Architecture, focused on sustainable development, building cultures, and construction. I firmly believe that we have a fantastic material that is not concrete. Of course, it has different characteristics, but it can replace many aspects of construction. This material is abundantly available on the planet, evenly distributed across every climate zone and continent, and it is offered by nature for free.



What is the ecological value of using earth as a building material?

Earth is a champion of regenerative and ecological building materials. It is naturally abundant, locally sourced, and requires minimal energy for processing. Unlike wood or concrete, which degrade over time, earth retains its quality without deteriorating. Additionally, earth buildings can be repaired, reused, or returned to the ground, promoting a circular construction approach. This regenerative quality makes earth an ideal choice for sustainable architecture.

How does earth construction reflect cultural and emotional significance?

In many cultures, earth plays a crucial role in traditional rituals and emotional memory. For example, in Ghana, the use of earth in construction is deeply tied to cultural identity. Earth-based architecture reflects local identity and climate, creating unique and meaningful spaces that resonate with the community. I have observed that initial resistance to earth construction often transforms into appreciation once the benefits are felt, as people begin to recognize the emotional connection these buildings foster.

What challenges do you face in promoting earth construction?

One significant challenge is the prestige bias that associates earth with poverty. Many people view earth as a «poor man's material,» undermining its value as a sustainable construction option. Additionally, there is a growing trend of greenwashing, where chemically stabilized earth is

marketed as sustainable but often contains more cement than traditional concrete. This misrepresentation can lead to confusion and skepticism about the true benefits of earth construction. I believe it should be called «dirty concrete» rather than «stabilized earth» to highlight the composition issues.

What technical innovations do you consider essential for the future of earth construction?

I advocate for a combination of low-tech and high-tech methods in earth construction. Traditional techniques, such as hand-molded adobe bricks, should be preserved and celebrated. However, there is also great potential in high-tech innovations, such as prefabricated rammed earth blocks and mobile factories that can streamline the construction process. Rediscovering indigenous knowledge, such as plant-based waterproofing techniques and ornamentation practices, can also enhance the viability and beauty of earth architecture.

credits : Anna Heringer

credits : Anna Heringer

What is the social impact of earth construction on communities?

Earth construction offers inclusive employment opportunities for unskilled workers and empowers local communities. The skills required for earth construction can be easily passed on without formal education, making it accessible to a larger number of people. Moreover, using local materials reduces dependence on industrial products, thereby promoting economic independence and sustainability within communities.

Earth requires craftsmanship; it needs people. We have 7 billion, even 8 billion people. So, we have a growing source of energy, and we also need to find work for this growing energy source. Earth and architecture can include many unskilled individuals, which raises another social question, especially in countries like Ghana or Bangladesh, and particularly on the African continent, where there are many people and many young individuals.

What is your vision for the future of earth architecture in Africa?

I envision a hybrid approach that combines high-tech solutions for urban areas with low-tech methods for rural contexts. Scalable systems, such as mobile factories and modular designs, can support multi-story buildings while retaining the benefits of earth construction. I believe that earth can be used for various applications, including interior walls, moisture control, and thermal comfort, making it a versatile choice for modern architecture.

What recommendations would you give to improve the perception of earth construction?

I recommend that we label materials honestly, avoiding misleading terms like «stabilized earth» without full disclosure of their composition. Investing in research and development is crucial to support innovation in earth construction tools and techniques. Additionally, promoting education and awareness through storytelling, design, and advocacy can help change public perception and highlight the value of earth as a building material.

Interview with **Meskerem Assegued** architect

«I wanted to create a space where people could learn more about the history and significance of earth construction. »

How did you start working with earth as a building material?

My journey with earth began with a deeply rooted passion for construction that I inherited from my family. Growing up, I was influenced by my father, who had a profound love for working with natural materials. In my twenties, I started transforming old houses with my husband, which allowed me to explore various construction techniques. My interest in anthropology fueled my desire to document ancient cultures and their building methods, particularly focusing on structures that have stood the test of time. I have always believed there is something intrinsically right about these structures, which is why they have lasted so long.

What inspired you to create a museum dedicated to earth construction?

The idea of building a museum came to me during my travels in Ethiopia, where I was captivated by the traditional buildings made of earth, stone, and wood. I realized that a museum would not only attract more visitors but also have a greater impact on preserving and showcasing these techniques than a private home. I wanted to create a space where people could learn more about the history and significance of earth construction. Despite the many challenges I faced in acquiring land and permits, I took my dream seriously and persevered, which ultimately led to the creation of the Zoma Museum, now serving as a center for education and appreciation of earth construction techniques.

What techniques and materials do you prioritize in your projects?

I strongly advocate for the use of traditional materials and techniques in construction. For stabilization, I prefer using fermented lime rather than cement, as I believe it leads to healthier and more durable buildings. I also experiment with organic materials, such as cactus juice, to enhance the properties of earth construction. My approach is to respect the local context and use readily available materials, ensuring that the buildings are not only sustainable but also resonate with the cultural heritage of the region.

What motivates you to continue working with earth construction?

My primary motivation is love—the love for craftsmanship, materials, and the history behind them. I believe that buildings should last for generations, and I am deeply committed to the attention to detail in construction. I often find

myself frustrated with modern construction practices that prioritize speed over quality. I want to create structures that are not only functional but also beautiful and meaningful, reflecting the culture and traditions of the communities they serve.

What challenges do you face in promoting earth construction?

One significant challenge I encounter is the societal shift towards modern materials like cement, which are often perceived as more desirable. Many people in Ethiopia and elsewhere prefer the appearance of cement buildings, leading to a decline in traditional earth construction techniques. However, I remain hopeful for the future and believe it is possible to create a marriage between modern and traditional practices. By demonstrating the benefits of earth construction, such as its thermal properties and durability, I aim to change perceptions and encourage more people to adopt these techniques.

What recommendations would you give to a company like Saint-Gobain?

I would recommend that Saint-Gobain prioritize responsible and human-centered construction practices. It is essential to explore new materials while respecting traditional techniques. My vision includes creating buildings that are not only functional but also beautiful and sustainable. Collaborating with artisans and local communities can lead to innovative solutions that honor cultural heritage while meeting modern needs.

credits : Meskerem Assegued

Interview with **Paul Marais** architect

«One of the main challenges is the variability of earth»

Can you share your background?

I studied architecture at Wits University in Johannesburg and gained valuable experience working in the UK before returning to Africa. My extensive experience with natural building techniques, including rammed earth, adobe, wattle and daub, and straw bales, has shaped my approach to architecture. I founded my own construction team due to the lack of skilled contractors in the field of earth construction, and I have worked in various African countries, including Botswana, Namibia, Kenya, Nigeria, and Ghana, as well as providing international consultancy in Australia and Europe.

What technical challenges do you face?

One of the main challenges is the variability of earth, which can differ significantly even within the same site. This variability makes standardization difficult, as earth requires specific site testing and adaptation. Unlike cement, which has consistent properties, earth demands a tailored approach.

Engineers who have worked in road construction have experience with the most engineered earth structures we know, I collaborated with these engineers, one of whom had over 50 years of experience working with earth, its stabilization, and its use. This was very helpful for me in the beginning to truly understand earth.

I undertake projects primarily based in South Africa, but we are increasingly working on projects elsewhere.

How is earth construction perceived culturally in different African countries?

I have had some international experience, most of it in Africa. Part of my work involves visiting sites to get a concrete idea, while another part is done via visioconference, where I explain step by step what to do. We have also conducted acceptability studies on earth buildings. In fact, the University of the Free State conducted a large study in South Africa, where they found relatively low acceptability. People living in these houses are quite happy, but those who do not live in them have a different perception.

In Africa, we also face colonial ideas. One of the actions of colonizers was to teach people that their own homes were inferior. There was a significant movement by colonizers to eradicate earth construction, which was seen as inferior, and we still see the consequences of that today. In my work, we have focused on high-end projects to try to make earth construction

more appealing. Once you have high-profile projects that work and people see that wealthy individuals are willing to invest, it changes the perception.

What role do labor and skills play in earth construction?

Earth construction is labor-intensive but accessible to unskilled workers, making it an excellent option for job creation. Traditional knowledge, particularly among women, plays a crucial role in finishing techniques, such as plastering and rendering. Workers in Africa are accustomed to handling heavier materials, like 50 kg bags of cement, which makes them well-suited for earth construction. By providing training and support, we can empower local workers and improve the quality of earth-based products.

How do you approach the cost and efficiency of earth construction?

Earth construction can be cost-effective at scale, especially for large projects. However, small custom projects tend to be more expensive due to logistics and labor setup. For example, I have successfully built large earth houses for less than the neighboring conventional houses. By optimizing the construction process and using local materials, we can reduce costs and improve efficiency.

What motivates clients to choose earth construction over conventional materials?

Clients are often motivated by the thermal comfort that earth buildings provide, especially in hot climates where air conditioning is not feasible. Additionally, ecological values play an important role, as many clients seek low-carbon and locally sourced materials. Economic reasons also come into play, particularly in remote areas where transporting materials can be costly. By highlighting these advantages, we can encourage more clients to consider earth construction.

What recommendations would you give to Saint-Gobain regarding earth construction?

I believe that Saint-Gobain could play a role in supporting access to lime, which is rare and monopolized in certain parts of Africa. It is also possible to produce earth blocks, tiles, and plasters with industrial quality control. Investing in research on alternative stabilizers, such as enzymes and hybrid binders, could further enhance the viability of earth construction.

credits : Paul Marais

Interview with **Andrew Raymond Horn** architect

«one can use more local material and upskill people, putting the money into skills rather than into transport and pre-made products»

Could you share your recent experiences with sustainable building materials?

My main driver is to use local material. Very often that means some sort of earth. Sometimes sandbags, sometimes straw bale, timber, stone, urbanites—whatever's local really. My approach is: instead of importing factory-made goods, one can use local material and upskill people, put the money into skills rather than transport and pre-made products. Obviously , you can't get away from industrial materials, but the idea is to upskill people to use more local materials. Each material has unique properties, and I often mix them based on the local soil conditions. The benefits include lower carbon footprints and healthier living environments, as these materials allow buildings to breathe and manage humidity effectively. I work with various types of Earth, including stabilized Earth and adobe. Each material has unique properties, and I often mix them based on the local soil conditions. The benefits include lower carbon footprints and healthier living environments, as these materials allow buildings to breathe and manage humidity effectively.

I've done rammed earth building. Ideally you build in the right season, depending on where you are, what material is available, and what's appropriate. Every project is unique—you assess skills, materials, climate, and client needs. I've also done a lot of work with adobe, training people to produce quality bricks, adding straw, controlling mixes, improving plasters. My clients are mostly owner-builders, home builders, NGOs. Sometimes cost is the motivation—they think it's cheaper, which it often is. Straw walls are thick, highly insulated, soundproof, energy-saving. But they require extra roof and foundation, so costs balance out. Light clay-straw panels are thinner, cheaper. I've also worked on government heritage projects, restoring old mudbrick houses, training masons. In Kimberley we trained people in adobe. I've consulted for architects on big projects—environmental centers, libraries, tourist buildings.

How do you ensure that the materials you use are suitable for construction?

It's crucial to assess the local soil before using it. I conduct tests to determine its composition and suitability for building. This way, I can optimize the mix and ensure durability without relying heavily on binders like cement, which can be harmful to health and the environment. I prefer lime because it has a lower environmental impact and is

less toxic. Lime allows for better moisture management in buildings, which is essential for maintaining a healthy indoor environment. Cement, on the other hand, can trap moisture and lead to structural issues over time.

How do you address the aesthetic concerns of clients who may prefer conventional finishes?

Education is key. Many clients are unaware of the beauty and potential of natural finishes. I often conduct workshops to showcase the possibilities with Earth materials, helping clients appreciate the unique aesthetics they can achieve. One major challenge is the perception of Earth materials. Many people still associate modernity with concrete and steel. Additionally, there's a lack of skilled labor familiar with natural building techniques, which can hinder project execution. If we can provide the right education and resources, I'm optimistic that Earth building can become more mainstream, especially as people seek healthier and more sustainable living options. I've done some research and I can see that you can have rural Earth. You can have stabilized Earth, you can mix both. You have a lot of techniques. You have industrial ones when you are producing some tiles, some blocks, or you have handmade, handcrafted materials.

Colors depend on local soils—light, reddish, orange earth tones. In Johannesburg we used different colored sands from mines, but architects wanted more contrast. We had to add oxides, even white cement, though expensive. So yes, color is a challenge.

How do you envision the future of Earth building in Africa?

I believe there's a growing interest in sustainable practices, especially among younger architects and builders. If we can provide the right education and resources, I'm optimistic that Earth building can become more mainstream, especially as people seek healthier and more sustainable living options. I'm curious if there are other architects in South Africa working with similar materials. Collaboration and sharing knowledge could greatly benefit our efforts in promoting sustainable building practices.

credits : Andrew Raymond Horn

Interview with **Salima Naji** architect

«Laboratory tests are often very well conducted, but on-site, the reality is different.»

What differences in approach have you observed between engineers and architects?

It is crucial not to let the formulation engineers take over. As an architect, I often find myself in disputes with them regarding material strength. They tend to establish protocols that go against natural bonds. I advocate for bio-regionalism, while they seek to minimize risks in all situations. Sometimes, a small detail in the formulation can change everything. Laboratory tests are often very well conducted, but on-site, the reality is different, especially here in Morocco, where conditions can be more unpredictable.

Could you tell us about the color of earth and its importance in your work?

The color of earth is essential to me because it is part of our identity. I have often noticed that some soils have a too gray or ashy appearance. For example, during one project, we used oyster shells mixed with the earth, which resulted in beautiful golden tones. We built a small rammed earth pavilion for the exhibition «Aïta, poetic fragments of a Moroccan scene» in Bordeaux.

What techniques do you use in your earth architecture projects?

I have seen exciting things about earth, particularly in the Toulouse region, where they also use raw earth. A friend of mine stabilized her rammed earth with cement for similar reasons to mine. Personally, I use crushed limestone or marble powder, which proves to be very effective. For example, when we install window sills and sand them down, it creates interesting new surfaces. I often use waterlogged soils here in Morocco. When we talk about stabilization, we need soils that have been waterlogged for a long time, as they are indeed self-stabilizing. However, this process often takes a long time. Therefore, engineers who are in a hurry and not thinking long-term tend to overlook these fermentation periods since they have already been fermented.

You refer to earth as the «material of the poor». How does this manifest in your work in Morocco?

In Morocco, it's quite dreadful. To distinguish oneself socially, one must use cement. I have had to insist on using raw earth in several projects, even though it was not well accepted at first. When I started practicing in 2004, there was no decree to regulate this. I discuss this in my book, «The Architecture of Common Goods.» We also have a group that sells raw earth products, but often these products are prohibitively expensive. That's why I accompany construction sites to teach artisans how to make their own raw earth bricks.

credits : Salima Naji

credits : Salima Naji

How do you work with artisans and companies?

I remember when I started, I began working on earth building. They [my clients] have a stunning historic house. Some people told me no, to change the materials, etc. So, in fact, I erased some things, but I left others. I didn't put everything out there; I was clever about it. You need to have a tremendous conviction, and many give up along the way. At first, they say yes, we will do it in earth. But then, when you dig deeper, you realize that they only built a wall as a facade. So, most of the time, it's just a facade, and it's rarely load-bearing. This is also due to the legislation that allows us to be load-bearing as long as we have more than 24 cm, which means we need about 50 cm in width.

I often train companies on-site. We make bricks by hand, which is quick, especially during dry periods, as they dry very fast. Currently, I have two raw earth construction sites underway. When constructing a maternity ward in the Tata region, we found that the indoor temperature was 27°C, while a neighboring building with air conditioning reached 37°C. This demonstrates the effectiveness of earth for thermal comfort.

Unlike rammed earth, which is very expensive in France, labor here is not priced the same. We do not have the same costs at all, and yet there are still many concerns. As a result, there are very few architects who work with raw earth, and many give up along the way when they realize the challenges involved

How do you manage to convince clients and suppliers of the importance of these materials?

Convincing clients and suppliers is a process. Once we have a design office that supports us, we need to convince the company. Often, the choice of the design office is not mine; it is decided by the state. I have had to train a good dozen companies so far. It is a long-term effort, but essential for advancing earth architecture in Morocco.

What about the next generation of architects?

We must balance innovation with tradition. I've seen firsthand how local materials can be effectively utilized in construction, and I believe there's a growing interest in this approach among younger architects.

Perspectives for Sustainable Construction on the African Continent

Towards a hybridization of knowledge and techniques

The future of earthen construction in Africa is shaping up as a fruitful dialogue between tradition and innovation. Architects such as Anna Heringer, Andrew Raymond Horn, and Chadrac Agbodjogbe emphasize the importance of preserving vernacular techniques while integrating technological solutions adapted to urban contexts and contemporary demands. This hybridization is reflected in the emergence of modular construction systems, the use of mechanical presses for earth blocks, and the experimentation with natural stabilizers.

Market trends in Africa show a growing momentum for local bio-based material sectors and a desire to industrialize the production of earth blocks, while respecting artisanal know-how. Some companies are investing in research on alternative binders, artisan training, and the development of appropriate standards. The 2023 report by the World Green Building Council highlights the importance of environmental certification and material traceability to reassure investors and users.

A response to climate and demographic challenges

In the face of rapid urbanization and population growth across the continent, earthen construction offers concrete solutions to the challenges of affordable housing, thermal comfort, and carbon footprint reduction. Earthen walls, with their natural ability to regulate temperature and humidity, help reduce reliance on air conditioning—an essential issue in cities where energy supply is costly and sometimes unreliable. This approach

credits : pexel - jagaba

aligns with the recommendations of the African School of Architecture and Urbanism (EAMAU) and UN-Habitat analyses, which see the promotion of local materials as key to building resilient and inclusive African cities.

Overcoming stigma and changing perceptions

One of the major challenges remains the perception of earth as a “poor man’s material.” Testimonials from Mariam Issoufou, Salima Naji, and Paul Marais show that recognizing the aesthetic, cultural, and economic value of earth requires emblematic projects, active education, and the promotion of both African and international examples. African cities are thus becoming bio-responsible laboratories, where architectural innovation is rooted in local identity and resource circularity, as emphasized by Armelle Choplin, professor of geography at the University of Geneva and specialist in the social, political, and material transformations of African cities.

A matter of training, transmission, and inclusion

The future of sustainable construction in Africa will also depend on the ability to train a new generation of artisans, architects, and engineers who can master both traditional techniques and digital and industrial tools. As discussed with Meskerem Assegued knowledge transmission, documentation of practices, and the inclusion of women and youth in the construction sector are essential levers for a just and sustainable transition. For Abre Crafford, it is also a role of frugality : «not taking more than necessary and reusing what the site offers us».

 credits : Mariam Issoufou architects and her collaborators, Yantala

Far from being a relic of the past, earthen construction is emerging as a driver of innovation, inclusion, and resilience for 21st-century Africa.

By combining heritage and modernity, and focusing on circularity and local anchoring, the continent can become a global model for ecological and social transition in the building sector.

This dynamic opens up opportunities for industrial and institutional stakeholders to:

- Invest in R&D on natural stabilizers, prefabrication processes, and material certification.

- Support local production and the creation of integrated value chains, from training to distribution.

- Promote the development of standards adapted to the African context, in collaboration with local and international institutions.

- Highlight pilot projects and feedback to shift perceptions and accelerate the adoption of earth as a modern building material.

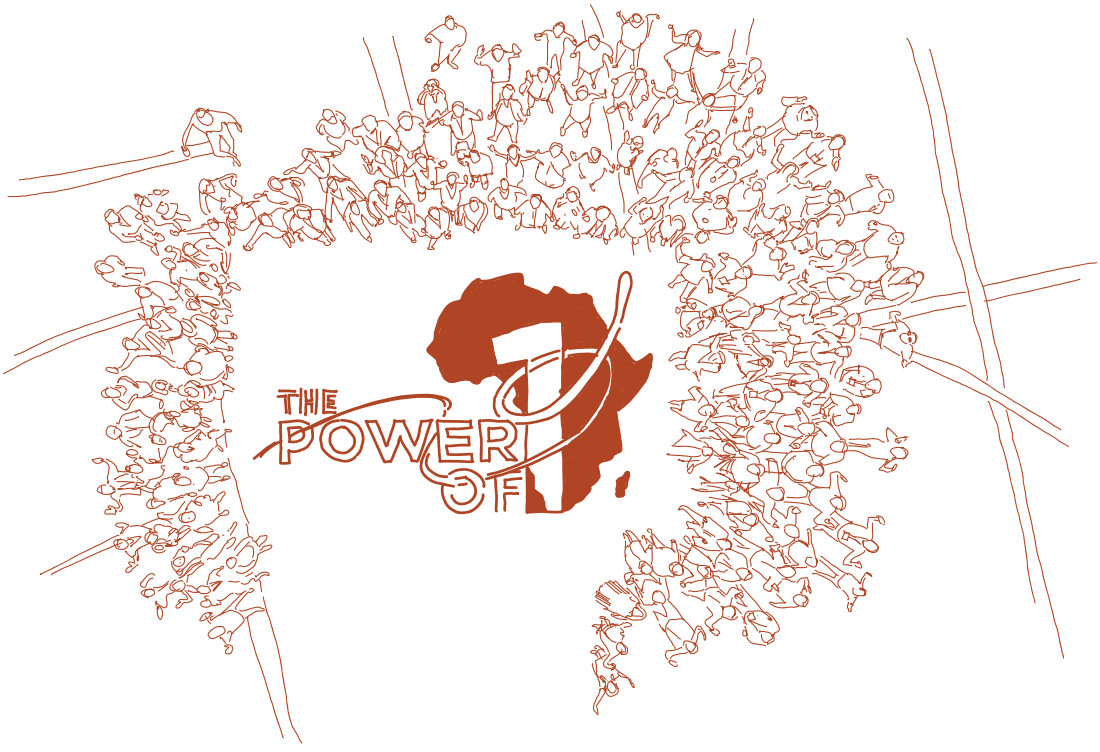
5.
What is MABA ?

MABA :
Make it in Africa to Build Africa

The Pulse of a Continental Commitment

More than a slogan.
More than words.
A rhythm. A pulse. A promise.
The beating heart of Saint-Gobain Africa.
MABA transforms a global purpose Making the world a better home into a continental force.
Not a one-size-fits-all approach, but a deep understanding of the nuances that make each country unique.
An embrace of Africa's cultural richness.
A commitment to designing solutions that do not merely adapt but thrive.
It is the fusion of innovation and tradition, where world-class expertise meets the wisdom of our lands, becoming something deeply personal.

MABA is an inclusive commitment , MABA is a movement in motion.
A rising wave uniting all who believe Africa's future must be built sustainably and inclusively.
Rooted in heritage.
Grounded in today's realities.
Driven by the ambition to shape tomorrow responsibly.
A rhythm carried by communities, industries, partners, talents and customers alike.
Belonging to all who choose to build Africa by making it in Africa.



MABA stands on four interconnected pillars:

Sustainability

The commitment to safeguarding Africa's natural resources is foundational.
Sustainable development is not an objective to reach… it is the framework within which growth must occur.
Across communities and ecosystems, progress and preservation move together.
On this continent, environmental responsibility and social advancement are inseparable.
Building responsibly today ensures that future generations inherit opportunity not compromise.

Local Production

Africa's transformation is powered by its own capabilities.
Local manufacturing strengthens resilience, reduces dependency, and anchors value within communities.
Investment in industrial capacity is more than infrastructure, it is economic sovereignty in action.
Each plant built, each supply chain localized, fuels job creation, skills transfer and long-term prosperity.
Producing locally is not only about efficiency.
It is about empowerment.

People

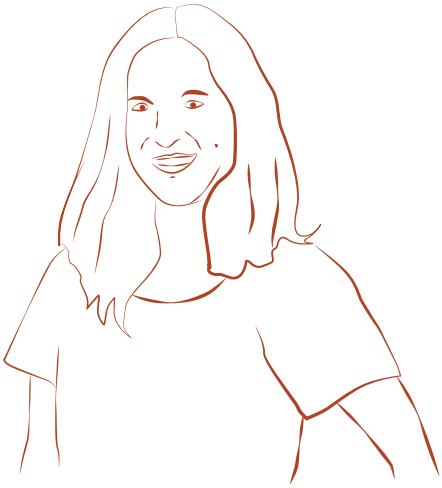
Africa's greatest resource is its people, its heritage, its diversity, its talent.
Sustainable growth depends on deliberate investment in human potential at every level.
Industrial training and development initiatives represent long-term commitments to nurturing the next generation of builders, innovators and leaders.
Honoring the continent's richness means ensuring opportunity is accessible, inclusive and transformative.

Customers

Lasting impact is built through partnership.
Understanding local realities, anticipating needs, and co-creating solutions define meaningful collaboration.
Innovation gains strength when locally available and globally benchmarked.
Technical expertise, proximity and responsiveness transform materials into solutions that truly serve.
Customer success becomes shared progress.

MABA is momentum.
A shared commitment.
A continental movement carried by those who believe Africa's development will be made in Africa to build Africa.

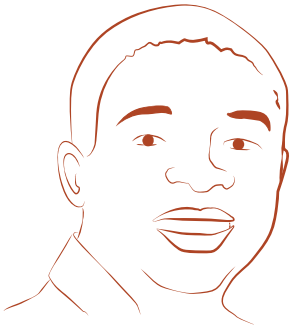
Interviewed Saint-Gobain Collaborators



Estie Van Zyl

Sustainability Manager

«As Sustainability Manager in South Africa, I am responsible for considering and reducing the environmental impact of our operations, specifically waste, water, energy, and carbon. Sustainability is a core pillar of MABA, and therefore it's important that sustainability is top of mind, reducing the impact of operations whilst committing to manufacturing locally instead of importing, and developing solutions that match local realities.»



Farayi Muhamba

Building Systems Development Specifications & Standard Watch

«A home is not only a place to live. It has a spiritual dimension... There is a way of organizing the courtyard, the entrance, the layout of the accommodation... There is a spiritual attachment to the house. [...] Modern architecture is far from the traditional way of building, both spiritually and materially...»

«For me, we need to raise awareness, develop standards and show concrete examples. The most important thing is to make this practical and accessible, especially for low-income markets.»

Anzuruni Malisawa

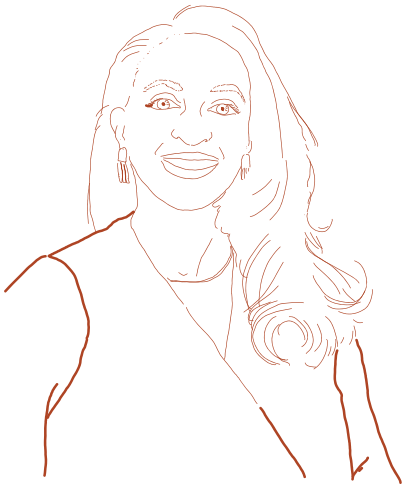
Business Developer: Central Africa

«The end user is the most important, because they are the ones who will live with the product every day and experience it over the long term. Next comes the role of the builder.»

Liya Frew

General Manager Saint-Gobain Ethiopia

«I think Ethiopia has always had a big relationship with nature in architecture, agriculture and daily life. Traditional homes, especially in rural areas, areas are built from earth, stone and natural materials that reflects an understanding of climate, environment and resource efficiency. Sustainability is not new to us. It has been embedded in our culture for generations. What we call green building today was in many ways traditional wisdom for Ethiopia and I believe for Africa as well.»



Thuto Caleni

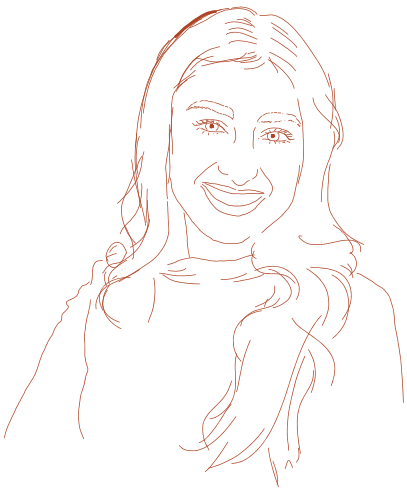
Product Marketing Coordinator

«Rammed earth offers environmental and practical sustainability benefits because it comes from local resources. In most cases, soil is taken directly from the construction site, which reduces transport-related emissions and limits environmental impact.»

Svarya Kesarparshad

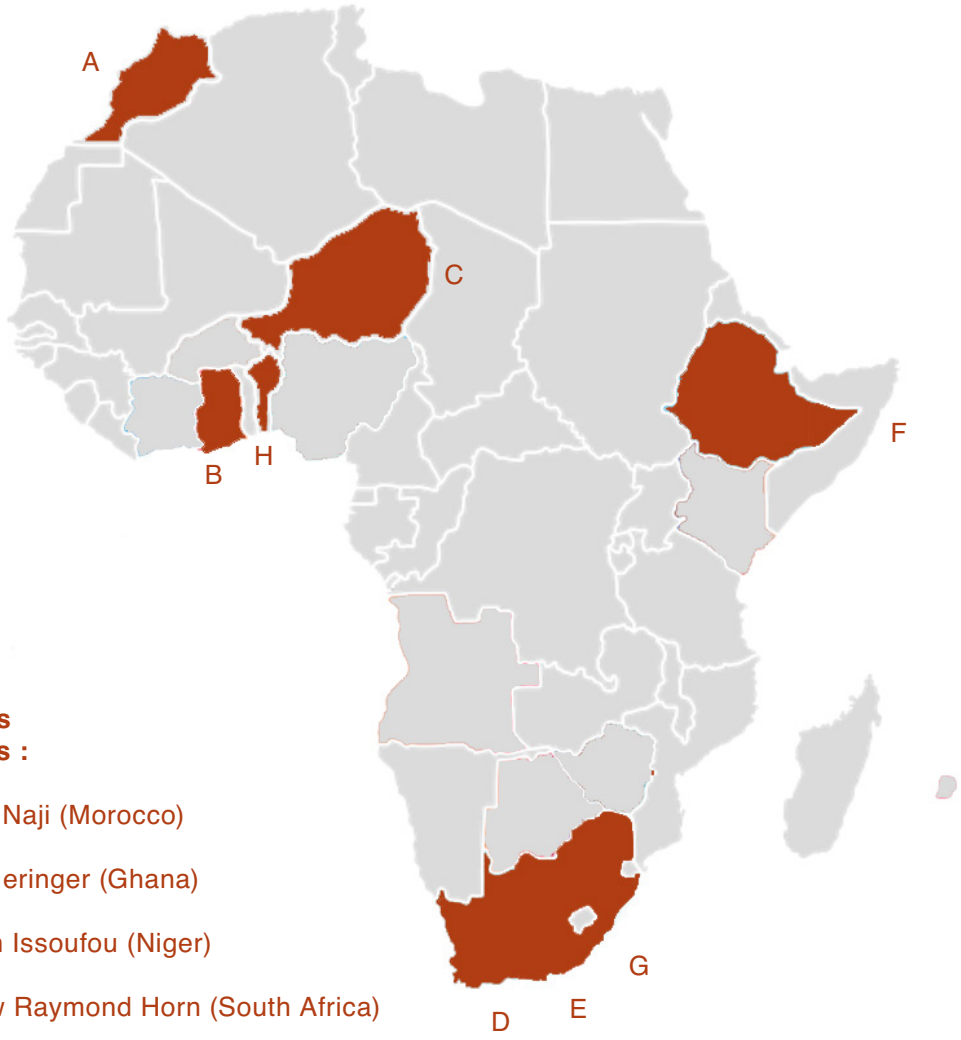
Marketing & Sustainability Graduate

«Traditional philosophies throughout Africa, Ubuntu, Hunhu, Akan, Uri, all recognize one's environment as an extension of the community. Most widely known is the saying "I am, because you are", an ideal that speaks to how one's well-being is interconnected with the well-being of the community and, therefore, the environment. It is a deep part of African heritage and indigenous truth to care for, protect, and preserve the natural environment to ensure the well-being of all. Sustainability, and by extension, sustainable means of construction, is not foreign or new to Africa; but rather, an act of remembering.»



6. Appendix

Interviews
localisations on Africa map



Architects interviews :

A- Salima Naji (Morocco)

B- Anna Heringer (Ghana)

C- Mariam Issoufou (Niger)

D- Andrew Raymond Horn (South Africa)

E- Paul Marais (South Africa)

F- Meskerem Assegued (Ethiopia)

G- Abre Crafford (South Africa)

H- Chadrac Agbodjogbe (Benin)

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Interviewers and writers

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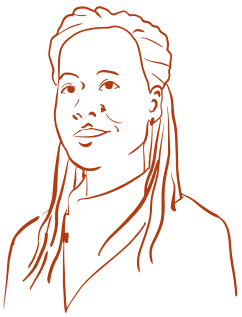

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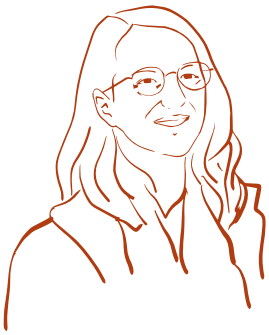

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DESIGN & USER EXPERIENCE TEAM
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