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Concrete Made in Africa

Armelle Choplin

"I dream of being a footballer like Samuel Eto'o or… a cement manufacturer like Aliko Dangote," explains Olumide, a 12-year-old boy, when I meet him in Lagos. Olumide, like many West African children, knows about Dangote, the richest man in Nigeria and in the whole of Africa (and 190th richest in the world according to Forbes Magazine 2024). Aliko Dangote made his fortune in Africa by producing and selling cement: the precious grey powder which, mixed with sand, gravel and water, is used to make concrete. Concrete has become a symbol of the continent's frenetic urbanization, construction boom and capitalist emergence. By tracing flows of building materials along the urban corridor appearing between Abidjan and Lagos, I propose to unpack the major role of cement and concrete in shaping contemporary African landscapes and societies (Choplin 2023). A mega-urban region is under construction along this 1,000km strip linking the cities of Abidjan, Accra, Lomé, Cotonou, Porto-Novo and Lagos: here there are more than forty million people who live, move and build in concrete (Choplin

and Hertzog 2020). Based on thirty months of fieldwork between 2016 and 2019 and complementary field visits in April 2023, this article highlights the tensions around the use of concrete. This material has various positive associations – such as affordability, widespread availability, modernity – but at the same time there are growing concerns about its unsustainability and vulnerability, as the cement industry is responsible for eight percent of greenhouse gas emissions globally (IPCC 2022) and sand has become a strategic asset and scarce resource (UNEP 2022).

Cement Depot in Cotonou, Benin. It is possible to buy bags of cement at any hour of the day or night. Photo: Armelle Choplin, 2018.

Cementification

In West Africa, cement and concrete are increasingly common: both lifted by the cranes which build skyscrapers in the city centres, and in the distant suburbs where poor households incrementally construct their homes. The pervasive grey colour of concrete offers a regular reminder that the city is constantly under construction. Rich or poor, decision-makers and ordinary urbanites have something to say about this material of great banality. From Eko Atlantic City, the artificial island in the heart of Lagos, to the outskirts of Dakar, to the new city of Diamniadio or Akon City, created by the famous Senegalese-American singer and named after himself, futuristic concrete towers are

constantly being erected. In West African coastal cities such as Abidjan, Accra and Cotonou, bridges, bypasses, and social housing programmes are being launched, at a cost of millions of dollars but also, and above all, employing tons of concrete (and of sand and gravel).

Cities in emerging countries are the new frontiers of concrete. Cement consumption is now used as an index of development, often compared to GDP. The world average is around 550 kilograms per capita. In West Africa, the ratio is just under 150 kilograms (*The Global Cement Report 2024*). The market is promising, and the major European cement companies, such as the Franco-Swiss LafargeHolcim and the German Heidelberg, understand this and aim to compete with Dangote. Since the 2000s, in the space of two decades Dangote has managed to open more than ten integrated cement plants in West Africa. He has created a new model of cement production in which the regional construction industry can be owned by Africans and its materials are sourced and processed in West Africa. Cement is now presented as a 100 percent African product, rather than an imported colonial material.[1] It is often subsidized by governments as a basic necessity to provide low-cost housing for the masses of poor people. The World Bank (2016) itself has seen the cement industry as a lever for development and a way to boost African economies.

[1] For the history of cement in Mozambique, see Morton 2019.

A concrete house is a symbol of modernity and success. Concrete also requires less maintenance than bamboo or mud, Ganvié, Benin.
Photo: Armelle Choplin, 2019.

A Social Binder

Concrete is a material, a commodity, a business, but it is also affectively charged (Archambault 2018). Behind this inert mass, there are many lives and the hopes of millions of men and women who seek to shelter their loved ones. In the Global South, where social security and protection systems are usually failing and access to the banking system is difficult, buying bags of cement and investing in concrete is a way of saving money. In the slums especially, building with concrete makes it possible to legitimize one's presence, to break away from the precariousness of wood and sheet

metal, and to negotiate compensation in case of eviction policies. Cement becomes a product of first necessity and the concrete block materializes the right to the city and one's belonging to it.

Unlike its production, which requires very advanced and energy-consuming technology, cement is simple to use. Mixing it does not need a steady electrical power source, nor does it require formal training or literacy. Pictograms on the bags sold are there to remind people of the proportions, which are generally known, including by women. Many women build by themselves in order to have their own house and no longer suffer the family yoke. For them, concrete becomes a symbol of emancipation and independence. The success of individuals is measured by the tons of concrete they have poured. "For retirement, we offer the professors two tons of cement. It's a sign of recognition and success," explains a university colleague in Cotonou, Benin. And it is common for lovers to offer each other bags of cement as a declaration of love, as 'durable' proof of their commitment to each other.

Women on a construction site, Cotonou, Benin. Many women know how to build their own houses.
Photo: Alice Hertzog, 2019.

Uninhabitable Concrete City

But in the context of global environmental change, concrete means heat islands, soil impermeability and mandatory air conditioning. It also means limestone extraction, massive sand removal, release of harmful particles, rubble and ruins. Concrete is ecologically unsustainable and does not age well. Several tragedies remind us of its obsolescence, especially when it is reinforced with corrodible steel: the collapse of the Morandi Bridge in Genoa in 2018 killing forty-three; the destruction of the Ikoyi

Tower in Lagos in 2021 resulting in the death of forty individuals. In Africa, collapses are part of everyday life (Smith 2020). These tragedies raise questions about the choice of construction materials, their environmental footprint and their maintenance, which is lacking in many cities due to insufficient financial resources or political will. Obsolescent concrete is creating uninhabitable cities.

I met François in Cotonou, the economic capital of Benin. I had come to visit him and see his new house, located on the outskirts of the city. He told me how happy he was to see his sacrifices bear fruit in the form of a home. But he also revealed one of its major flaws: "The problem is that it is too hot inside. At night, I sleep outside because it's too hot for me. But outside, there are mosquitoes." François has built an uninhabitable house. Concrete is not suitable for tropical climates as it retains heat. The widespread use of concrete implies a growing presence of air-conditioning systems, which are energy intensive and increase the carbon footprint of a dwelling. Cooling makes concrete cities and houses habitable but contributes, in however small a way, to making the planet uninhabitable.

Many houses, like François's, are built without windows and have little natural ventilation. These concrete houses are uninhabitable without air conditioning, Cotonou, Benin.
Photo: Armelle Choplin, 2018.

Building Africa With(out) Concrete?

In March 2022, Burkina Faso architect Francis Kéré was awarded the Pritzker Prize, the equivalent of the Nobel Prize for architecture. This distinction marks the recognition of African architecture, which has long been ignored and denigrated (Meuser and Dalbai 2021). Kéré invites us to explore alternatives, proposing a more considered use of concrete, a material now widely criticized for its carbon footprint. Architects and engineers increasingly want to move away from all-concrete construction. Experiments by the CRAterre research centre in Grenoble, France, and the FACT Sahel+ collective in the Sahel countries are promoting constructions with recognized thermal values, local knowhow or the use of local materials such as straw, earth or bamboo (Vandermeeren 2020). In Senegal, the company ElemenTerre advocates earthen construction using compressed raw earth blocks. The Worofila collective offers buildings made of earth and Typha reed (also known as bulrush or cattail), an invasive plant that grows in the wetlands on the outskirts of Dakar. In the Sahel region, La Voûte Nubienne employs clay: this technique, which originated in Nubia, Egypt, and was revived by Egyptian architect Hassan Fathy in 1973, is used to construct earthen arches and domes to cover buildings without the need for wood or corrugated iron.

AI image, Prompt: "Afrofuturist and ecofriendly city in Africa, with a majority of buildings made out of mud, in the style of Francis Kéré."
Image: Bing 2024.

At the moment, these initiatives seem scattered and limited to just a few individuals. Yet the emergence of these networks and exchange platforms helps to give visibility to such ecological alternatives. In addition, the international recognition of Francis Kéré's work is a major breakthrough, particularly in terms of architectural training (with new courses in vernacular architecture and local materials appearing in schools of architecture). These experiments show that African cities will play an important role in the future of the planet and can be the sites of a new Afrotopia (Sarr 2020), a utopia that takes Africa as its starting point.

The proliferation of concrete cities is not just an African phenomenon. On the contrary, this process of cementification, generalized in the Global South, reveals many of the contradictions of our ever-more urban world: over-consumption of resources, polluting industries, profits of large private companies versus the need for housing and infrastructure, the positive image of concrete associated with modernity and success, the rhetoric of development… This rapid growth of concrete cities calls for further research and broader discussions on uneven development, gender dynamics, land claims, alternative building materials and more. Concrete invites us to reconsider the links between materiality, inhabitability and our urban futures.

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