



Illustration by Haam Juhae

Learning From the Kariba Dam

Climate change and neglect have brought the mammoth structure at the border of Zambia and Zimbabwe to the brink of calamity — a crisis prefigured in the dam's troubling colonial history.

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The Kariba Dam is failing. Since the late 1950s, it has sat on the Zambezi River, on the border between Zambia and Zimbabwe, in one of the zigzagging gorges that ripple the land there. It provides 1,830 megawatts of hydroelectric power to both countries and holds back the world's largest reservoir. For the last decade, scientists and reporters have issued warnings about the dam's potential to cause ecological disasters — of opposite kinds. On one hand, low

rainfall has yielded water levels that barely reach the minimum necessary to generate electricity. On the other hand, heavy rainfall has threatened to flood the surrounding areas. When the floodgates were opened in 2010, 6,000 people had to be evacuated.

Climate change catastrophizes the weather — and when it comes to such extremes, dams are, well, inflexible. They cannot be narrowed enough to eke more force from less water during droughts, and far worse, they cannot be expanded enough to accommodate floods. The only other ways to handle floods are to let the water flow over the top of the dam or to open up a spillway for controlled release. Neither of these measures is foolproof at the Kariba Dam because of how the passage of time has worn it down. The dam was built on gneiss and quartzite and is made of concrete — 80 feet at its thickest point. But over six decades of the waters' rushing through it, tumbling over it and crashing down on its other side have carved a pit at its base and erosion threatens its foundations. Its plunge pool is now a 266-foot-deep crater.

As the stony facade continues to crumble, the likelihood rises that the Kariba Dam will not just fail but *fall*. If the dam collapses, the BBC reported in 2014, a tsunami would tear through the Zambezi River Valley, a torrent so powerful that it would knock down another dam a hundred miles away, the Cahora Bassa in Mozambique — twin disasters that would take out 40 percent of the hydroelectric capacity in all of southern Africa. At the same time, longer hot seasons have drained the reservoir to record lows, and drought-induced power cuts have become a daily reality for homes and businesses. The World Bank is supporting efforts to secure the Kariba Dam, but any attempts to fix or expand it risk weakening it further, which would be disastrous in the event of a flood.

Whether the water is too high or too low, the lives of millions of people are at stake, to say nothing of the natural ecosystem. It's a familiar, seemingly inevitable tale of human folly: One of our most ambitious efforts to harness the power of nature has left us exposed to nature's vagaries.

Is this just a failure of our power of prophecy? When we talk about climate change, we talk about our inability to predict and control what's coming, to step into the same river twice. We're out of time, in more than one sense: We've fallen out of rhythm with the circulatory relations between sun and rain and earth. We've damned ourselves, foreclosed some of the future's forking paths — this is the aspect of time we call the subjunctive, the grammatical mood for what is imagined or wished. A river's branches suggest to us what *could*, *would*, *should* be. But the subjunctive mood — when it comes to rivers, when it comes to time — doesn't move in only one direction. If we look back, it's clear: It didn't have to be this way.

The history of the Kariba Dam is the story of a war over the past and the future of a river. That war was fought in the 1950s between European colonial powers and the local people in a place then called the Central African Federation or the Federation of Rhodesia and Nyasaland. The federation was a short-lived colonial experiment — or fiasco, depending on your perspective — that merged three adjacent territories with historically disparate relationships to the British Empire. Southern Rhodesia (now Zimbabwe) was a self-governing colony founded by the British South Africa Company; Northern Rhodesia (now Zambia) and Nyasaland (now Malawi) had been demarcated as British protectorates. The decision to conglomerate the three territories into one came from the colonialists, whose motivations were exploitatively economic and crudely economical.

Colonial officers had brought some of the tribal chiefs in line by appointing them to largely nominal positions in the native authorities. But the younger, educated, radical Africans — some of whom fought for the British in World War II — wanted more say in their fate. They resisted federation fiercely. They spoke up from their positions on local councils. They staged protests and boycotts: “Down with federation! To hell with federation!” They were worried by the fact that federation would move the center of power to Southern Rhodesia, whose more deeply entrenched system of segregation, the Jim Crow-like “color bar” — Africans couldn't go to bars, hotels or movie theaters at the same time as Europeans — seemed destined to seep into the neighboring territories if they were merged.

The choice of where on the Zambezi River to build a dam was dictated by the same gravitational shift. The river's source was in the northwest of the nascent federation, near the border with Angola and what was then the Belgian Congo. It curled down through Northern Rhodesia before heading east, following — in fact constituting — its border with Southern Rhodesia, then slanting across Mozambique to its mouth in the Indian Ocean. The largest tributary of the Zambezi was the Kafue, which flowed into it from the north at the center of the segment of the river between the two Rhodesias. Just south of that confluence of currents was a gorge known as Kariba.

From the mid-1940s on, there was debate about whether to build a dam on the Kafue or at Kariba. Northern Rhodesia had decided to begin construction on the Kafue, which was closer to the Copperbelt, a valuable mining hub and urban center. The Kafue runs through natural floodplains. A dam there — which was eventually completed in the 1970s — would be smaller and more complicated to build but cause far less trouble for the people and the environment. After the federation was formed in 1953, however, Southern Rhodesia fought for the Kariba Dam to be built first. At that crucial juncture, why did the federation's government follow the Kariba fork?

It was a question of power. A French engineer, André Coyne, advocated the Kariba site because it would supply more power, at greater value for the cost. The Southern Rhodesians also wanted the dam to be closer to the new seat of political power in the federation's capital, Salisbury. The larger Kariba Dam would be a technological triumph and a grand imperial project, raising the reputation of the backwater colonies. Newsweek later described it as a

monument to “the know-how of Western capital”: “When the Zambezi River was harnessed, the queen mother cheered.”

Coyne’s French company designed the double curvature dam; an Italian company, Impresit, was hired to build it; the World Bank granted a loan to pay for it. The Kariba Lake Development Company – largely made up of British personnel – was established in 1957 to conduct research and piece together some ad hoc environmental and social regulations. There was barely any assessment of the potential ecological impact of the dam, much less the human costs.

So it was only in the middle of construction that the federation’s government began to take seriously the question of what to do with the 57,000 people who lived in the Gwembe Valley that was to be flooded to build the dam – a place where, for centuries, they’d fished in the Zambezi and farmed on soil made rich by seasonal floods, a place they called home.

The word *kariba* was a corruption of *kariva* or *kaliba*, a local term meaning “trap.” It already named a place on the river, a massive stone slab that jutted out of the water at the opening of the gorge. One legend among the local Tonga people claimed that this rock was one of three that had once formed a kind of bridge across the river – a lintel that resembled the animal traps they used – until a flood washed the other two away. It was the sole remnant of a geological event – and from another point of view, a warning. Other legends said that this was the home of a river god named Nyaminyami, with the head of a fish and the twisting whirlpool-like body of a snake. The British took one look at that big rock and decided it was the best place to build a dam, and the best word – mispronounced because they couldn’t wrap their lips around the soft “b” and “l” common in Bantu languages – to explain to the Tonga exactly what a dam was.

Trap a river? The notion was so outlandish that the Tonga began to ignore the district commissioners, who despaired of convincing the villagers – only a few of whom had ever even witnessed electricity – that the dam was really going to be built, that their ancestral homes would soon be underwater. As David Howarth puts it in his blinkered but

engaging 1961 history of the Kariba, “The Shadow of the Dam,” “the whole idea of stopping the river was absurd” for the Tonga: “Most of them admitted that the Europeans would probably try, but the Europeans did not know the river as the Tonga knew it; and the old men argued that if anyone thought he could stop the river by building a wall across it, it only showed he had no idea how strong the river was. Let them try ... the river will push the wall over, or run round the ends of it.”

This is exactly what happened. Seasonal rains can swell the Zambezi up to 20 times its dry-season size. In late 1956, news came from upriver that an “exceptional flood” — so exceptional it would come to be called the Hundred Years’ Flood — was on its way. The water rose 66 feet and drowned the cofferdam that was in place for construction. When the waters finally subsided, only a crane had been lost, but the engineers were shaken by the unexpected and awesome sight of the torrential deluge.

They built a second cofferdam higher — but not high enough. The very next rainy season, the tributaries joined forces once more. This time the chances were deemed one in a thousand. The Thousand Years’ Flood of 1958 swept away a suspension bridge, which “writhed like a snake when the water touched it.” The river rose 116 feet to the top of the second cofferdam and poured over it, creating a waterfall 28 feet high. The Tonga had been roundly mocked for superstitious predictions that the “huge serpent” living in the Zambezi would “be angry with the white man’s wall and knock it down.” Now, the journalist Frank Clements declared: “Nyaminyami had made good his threat. He had recaptured the gorge.”

The dam seemed cursed. Late in the construction, some scaffolding gave way. Seventeen workers fell into a hole and were buried in wet concrete. Some say their remains were picked out, others that they remain entombed in the dam. When the floods receded, the engineers rushed to make sure the dam was complete before the following rainy season.

This meant that the wildlife now urgently needed to be rescued before the Gwembe Valley became the largest man-made lake in the world. “Operation Noah,” as it was messianically named by white conservationists, managed

to capture and remove 6,000 animals, though thousands more died in the floods. (This focus on the wildlife as the principal victims has persisted as the central story of Kariba; a recent BBC article about the dam revolves around a lone baboon “marooned” on an island in the Zambezi.)

The people proved to be more intransigent than the animals when it came to forced resettlement. The government determined that the Tonga were to move to Lusitu, an area to the north, and began resettling 193 villages one at a time, carting the people and their property there in trucks. These new lands had poor, stony soil. There was an almost immediate outbreak of dysentery. The Tonga way of farming, which relied on seasonal floods and leaving land fallow, wasn't possible here. The ratio of population to land was radically unbalanced. Traditional laws regarding the distribution of property were upended.

Those who had not yet left the Gwembe Valley, already concerned about the disruption of ancestral shrines and the lack of adequate compensation for the loss of their homeland, now had even less reason to leave. Some had been radicalized by the African National Congress — a nascent, nonviolent political party whose members agitated for the breakup of the federation and later led the movements that decolonized its three nations. The congress encouraged civil disobedience in the face of the relocation.

As is often the colonial way, over time the federation's persuasion campaign gave way to insistence, then violence. The laws of Northern Rhodesia in fact prohibited forced removal, so the Tonga Native Authority was persuaded to

approve a legal order, which was translated and broadcast to the people: “The Government is quite satisfied that the Lusitu plan is in your best interests and now intends to carry out this move without delay. Those who resist will be moved by force, using the police you see here today.... Anybody who obstructs the move will be prosecuted. When people have moved from a village, the huts will be destroyed.”

The people rebelled. The villagers of Chisamu, who were governed by a chief named Chipepo, made a series of charges at the police, shouting and gesturing with their spears, playing drums and singing war songs. The standoff lasted for days, the police conducting drills, Chipepo’s people imitating them. “They marched and countermarched in single file,” Howarth writes, “carrying their spears like rifles on their shoulders, and instructors marched at the sides of the columns like sergeants or platoon commanders. Sometimes it looked like a parody, but perhaps they did it to convince themselves.” The governor of Northern Rhodesia was brought in for an *indaba* with the leaders, but to no avail. When the constables moved in on the villagers, violence broke out. Eight Tonga were shot and killed. The people relented.

The dam was completed. The valley was flooded. Nowadays, fishing boats and “sunset cruises” slip up and down the dwindling lake above the dam. The eeriest, most beautiful thing about Lake Kariba – its main attraction for tourists – is that the submerged trees of the Gwembe Valley still stand. You can see them reaching up from the depths, branching up out of the water, forking against the sky

“**The whole might** of modern technology was nearly caught by the primeval, savage forces of Africa,” Clements wrote of the Kariba in 1959. With this Manichaean hyperbole, he tidily conflates the power of nature, the myth of Nyaminyami and the resistance of the Tonga, even as he diminishes all three. In the end, the might of modern technology won, escaped the trap – or perhaps became one. Many historians cast the story of the Kariba Dam as a paternalistic tale about how a zealous belief in “progress” overwhelmed a hapless tribe of what David Livingstone once called a “degraded” people. Another way to see it is that the building of the Kariba Dam redirected enormous

wealth to colonial parties at the expense of the rightful dwellers of the Gwembe Valley, who are now considered “development refugees” and lack adequate access to water and electricity. As late as 2000, three of the nearby districts where the Tonga now live were still not connected to the national grid lines.

This dam business now directs wealth to neocolonial parties. The China National Complete Engineering Corporation is building another \$449 million megadam on a tributary of the Zambezi. Within its own borders, the Chinese government is turning away from hydroelectricity and toward solar and wind energy. They know that, in the midst of a global climate-change crisis, finding alternatives to dams is better than trying to fix them.

Africans know it, too. In 2014, Partson Mbiriri, then the chairman of the Zambezi River Authority, told the BBC, “It’s equally important to think about solar – on the assumption, of course, that we’ll continue to have sunshine.” While various figures of authority – colonial, governmental, environmentalist, journalistic; then and now, well-meaning and mercenary – have all been deeply concerned to explain to Africans what will happen to us if we do not move out of the path of progress, they have never really bothered to listen to us.

The Africans of the federation did in fact articulate a set of prescient questions and demands – subjunctive possibilities. In 1955, the Northern Rhodesian African National Congress leader, Harry Nkumbula, wrote to the queen of England, asking her to appoint a commission including Africans “to determine whether it is just that the people should be dispossessed of their land”; whether the power generated by the dam “could not be better generated by nuclear energy”; whether the compensation the people received was sufficient and whether “the lands to which the people are being moved are equal in value” and fertility to those that would be flooded. Perhaps human folly is culturally relative.

When they were first informed about the dam, the Gwembe Native Authority made a set of 24 demands respecting their rights – to land, property, reparations, protection, information. The 11th was: “That in moving people, their choices shall be seriously considered before

they shall be ignored.” And when Chipepo’s people staged their ultimately futile uprising, they wrote messages in English, which they sent to the district officers and the native authorities or nailed to trees on the battlefield: “We shall die in our land... We don’t want to be removed to Lusitu or to any place. We will not go home until you dismiss your army of policemen. We will not fight with weapons but with words.” What would paying attention and respect to their words have made possible?

The Tonga knew the Zambezi. They knew that a river keeps time, not like a clock but like a chronicle. They knew its sediments and grooves, the patterns of the beings dwelling within it and nearby, its might and its tendencies. Kariva rock itself was testament to a river that had knocked away its stony triplets, a river so powerful that it seemed that a god must live inside it.

A river can channel water into an immense power. A river can also flood, spread into the spaces open to it. A river is both a singular, driving force and a distributive, branching one. The Tonga had long lived peacefully on both sides of the Zambezi, crossing back and forth to court brides, borrow food, visit relatives. They knew that you don’t stop a river; you move over, through and with it. You follow its paths. You may step into it as often as you wish, but you do not stay.

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Learning From the Kariba Dam

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Correction: July 28, 2020

An earlier version of this article misstated an aspect of the Kariba Dam. Erosion threatens the foundation; it is not the case that the foundation is eroded. The article also misstated the location of a future dam. It will be on a tributary of the Zambezi River, not on the Zambezi River. And the trees in Lake Kariba are dead trees; they do not continue to grow.