

## Conclusion

How could it be that a multi-billion-dollar dam project crucial to the regional economy was sited in a country with a global reputation as a soil erosion hotspot? How could it be that so little was done to understand the threat of sedimentation, much less address it? I kept asking myself these questions over the course of my research. Surely, I thought, I was missing something; some piece of information or rationale.

On one hand, South Africa's desperation is clear. Perhaps this explains things, I considered. The geographic fact that the country's commercial and industrial hub was built upon the arid Witwatersrand gold reefs puts the country in a tight spot. Its poor planning is also clear. Rather than taking steps to cut demand, such as fixing leaky urban water infrastructure, cutting subsidies to major industrial consumers, or otherwise controlling consumption of water, municipalities and water management bodies there (as elsewhere) work with a myopic supply-side economics: get more water and business will follow.<sup>1</sup>

Yet, it's not simply a matter of the fact that "decision makers" failed to gather all the right information to arrive at a sound policy. This would presume that large dam projects like the Lesotho Highlands Water Project result from a deliberative process with a coherence of purpose—as though landfills were built for their methane. Or, perhaps better put, a large dam project is like a fresh carcass on the roadside, hit by a reckless driver: a throng converges upon the scene to pick it clean. These projects are a feeding frenzy for industry and politicians. International consultancies, construction syndicates, law firms, distribution companies, and others thrive on them. They carry prestige for domestic politicians who use them to demonstrate development, to generate jobs, and to cultivate their connections with business.<sup>2</sup>

Enthusiasm for large dams had diminished somewhat as a result of five decades of intense international activism, but we currently live amid a global boom in dam construction.<sup>3</sup> Engineering experts from countries without any more good rivers

to dam, such as the United States, Canada, France, and more recently China, fan out across the globe to push their wares.<sup>4</sup> As of 2020, over fifty-eight thousand large dams—that is, a dam wall with a height of 15m or more, or which has a reservoir volume of more than 3 million m<sup>3</sup>—have been built around the world.<sup>5</sup> This, even though large dams on average overrun their budgets by 96 percent and their construction schedules by 46 percent.<sup>6</sup>

That kind of calculation excludes so many other costs, too. Dams and their associated infrastructure, such as roads and power lines, have displaced millions of people worldwide. They are often presented as “development projects” by governments and other proponents, but there are few benefits for displaced “development refugees.”<sup>7</sup> Resettlement disrupts communities and kinship networks, forces people to find alternative livelihoods, and creates tension in receiving communities.<sup>8</sup> Compensation schemes for resettlement are often inadequate and tend to presume that resettled people can move easily from one livelihood into another; those living downstream are neglected even more so.<sup>9</sup>

It is not only humans that suffer, of course. Up- and downstream from dams, biodiverse riparian areas are either inundated with water or starved of it. Inside the reservoir, a novel ecosystem forms in the transition from river to lake. Decomposing organic material off-gasses CO<sub>2</sub>.<sup>10</sup> Diminished flows of water and sediments downstream make life impossible for many plants and animals; stagnant pools breed bacteria and water-borne disease; delta floodplains subside, coasts erode.<sup>11</sup> The sediments trapped behind the dam wall, such a problem for the dam, are a source of life-giving nutrients downstream. Not only are flows reduced below the dam, but they are often regularized in ways that are fundamentally different from a naturally flowing river, which experiences fluctuations throughout the year, with surges from storm waters, and so on.<sup>12</sup> While some dam projects put in place “instream flow requirements,” which are management regimes based on the minimum specific ecological requirements of the downstream community, none were developed for the Katse Dam.<sup>13</sup> Ecological and social consequences were quite obviously an afterthought.<sup>14</sup> Only a few, vague provisions were made in the LHWP Treaty for such impacts in contrast to the long, detailed financial and engineering sections. An environmental impact assessment wasn’t even done. Only in 2004 was an instream flows program drawn up and put in place (without data on the predam ecosystem).

As these problems pile up, as sediment accumulates in reservoirs and water flows to Johannesburg, I wonder: at what cost will the contradictions between storage and extraction in this repurposed labor reserve be reconciled?

At the leading edge of global natural resource politics, Lesotho offers a cautionary tale about the technological promise of engineering water transfers from one river basin to another in the Anthropocene. More broadly, it calls into question beliefs about human dominion over the natural world, including those that continue to influence the humanities,<sup>15</sup> while also showing natural scientists why

power and critique are vital to the project of understanding and preserving our environment.

Humans are thought of as the preeminent “niche-constructors,” referring to the practice of cultivating the conditions that will maximize an organism’s potential for reproduction<sup>16</sup>—like beavers that build dams to create safe habitats for themselves. As outlined by G. Evelyn Hutchinson, a niche is an “n-dimensional hypervolume,” in which any number of limit conditions for a species’ survival could be identified.<sup>17</sup> Niche construction, then, is the process of remaking environments into one’s own image: humans bring environments into conformity with the human hypervolume. Humans under the spell of (or at the mercy of) the expansionist logics of imperialism and capitalism impose this environmental model across the globe—pushing and pushing until the system falters. Geoengineering projects like the LHWP then promise to put things back into alignment.

The innovation of the Anthropocene concept,<sup>18</sup> however, has been to show how this sign of human power and supposed mastery is also a source of human peril. Human niche construction entails species-threatening human niche destruction.<sup>19</sup> The dam-building feeding frenzy looks an awful lot like niche-construction-destruction: servicing “human needs” in general through reckless projects that are in fact fueled by racial capitalism—designed for a specific set of humans rather than humans in general. This is not a “human” niche so much as it is an imperial one.

Scrutinizing the aesthetics and politics of Lesotho’s water-export economy, we can see not only the material labor but the interpretive labor required to stave off the contradictions of niche construction-destruction. The water economy has incited a profusion of discourse about the environment in relation to water’s flow across the landscape: theorists of fluvial water and historiographers of the landscape have been called into action. To paraphrase Emily Martin’s writing on human reproduction discourses,<sup>20</sup> however, in debating the problem of sedimentation in Lesotho we learn about more than simply the flow of water over land; we learn to inhabit fluvial imaginaries with all the cultural and political content that comes with them: of allegations of rural mismanagement, of aspirations for better futures, of state power, of partisan politics, and more. Water’s very nature as a landscape feature has come under scrutiny, and this spasm of theory stems from the economy’s central contradictions, namely that it demands storage but also extraction; that it demands minimal impact by livestock while leaving livestock production as one of the only ways to make a living.

As “water silos” or “water factories,”<sup>21</sup> Lesotho’s mountain rangelands have been converted into “natural infrastructure” for South African industry.<sup>22</sup> The transformation of Lesotho into a water storage tank is not an innovation but rather a variation on a theme, however, having long served as South Africa’s labor reserve. That history is instructive, as it reveals the forms of social, symbolic, and ecological engineering required to make storage possible. Elites work to promote the notion

that water abundance is an inherent feature of the nation-state of Lesotho and part of a Sotho cultural lexicon—a kind of water I call “national water.” But national water is unfamiliar to most people in Lesotho, given that its homogeneous spatial and temporal framing contradicts everyday realities. Rather than a property of the nation as a whole, Lesotho’s water is more commonly understood as patchy, erratic, and destructive. Indeed, this destructive water is now imperiling the water economy. The volumetric water of the reservoir is confronted by the fluvial water upstream from it. As during Lesotho’s labor-reserve era, the omissions and contradictions of these storage infrastructures threaten the system itself. Water is a gift that destroys.

In spite of Lesotho’s global reputation as a soil-erosion hotspot, the LHWP ignored the issue of sedimentation for those critical years when the project was being made into law. As the problem of sedimentation inevitably surfaced again, old discourses about the impact of rural land use on water’s flow across the landscape have seen a renaissance. Rural people are said to need a better sense of fluvial water, which would help them understand soil erosion while also investing in them a concern for water as a national good. In the meantime, soil conservation works, such as gabions, check dams, and silt traps, are being constructed to address the problem directly. The conservation efforts are both a failure and a success. Often poorly constructed, unable to stop sediment, sometimes even worsening erosion, and falling apart from the start, the structures are crucial components to water production. This is because they serve a parallel goal: namely, to redistribute a small portion of national wealth to an impoverished, voting public in rural areas through labor-based welfare programs. Providing meager employment to rural people who have few other opportunities, they defer the social unrest that might otherwise accompany Lesotho’s precarious economic position.

While those conservation structures are presented as evidence that government agencies are fighting soil erosion, the full extent of erosion—and the effectiveness of conservation works in preventing it—goes largely unmeasured. In place of measurement, indicators of land degradation are used by conservation workers to identify soil erosion, including dwarf shrubs. Shrubs do not always co-occur with or promote erosion (and likely even prevent it), but they have come to represent land degradation and desertification in the flesh through a crude equation: more shrubs equal more soil erosion and less water.

Beyond educating rural people about fluvial water and building conservation works that will slow its flow, bureaucrats from the Lesotho government and foreign NGOs seek to engineer social forms that might protect Lesotho’s water resources. But they cannot extricate their efforts from the history of which they are part. The many interventions that have been made into land management, including indirect rule, postcolonial efforts to undo the effects of indirect rule, development and conservation projects, and grazing associations are seen as getting to “the source” of the problem: inadequate grazing institutions. In fact, they complicate rather

than streamline rangeland management, undermining rangeland institutions into the future, each subverting the ones that come after it.

Stopping erosion might be impossible, anyway, given the scale of the problem and the nature of rains, soils, and topography in Lesotho. Conservation measures would need to overcome the fundamental, structural causes of land degradation: the abiotic properties of Lesotho's natural environment (e.g., its steep slopes and erratic climate) and the forces that push people into livestock production. Additional pressure has been put on the rangelands in recent years with the decline of the labor-migration economy, when sheep and goat production went from a retirement strategy to a primary livelihood. Increasingly unpredictable rains make this even more acute.

Revisionist environmental histories in Africa taught us to be skeptical of claims about land degradation, but livestock can have dramatic impacts on environments, even if these effects might be modulated by environmental variables. The notion that Lesotho's landscapes are in poor condition is not particularly disputed, even if definitions of "poor condition" vary. Stocking levels and land use should be understood not as an indigenous tradition that is misidentified as harmful, but rather a result of a century of pressures from Southern African racial capitalism. Basotho living in the highlands are not a benign indigenous population "in tune with" their natural environment, even though certainly they know more about how to manage their land responsibly than elites from the lowlands or foreign NGOs with little understanding of the highlands' history or ecology. Rural Basotho form part of a peasantry that is forced to occupy a harsh territory, which "scratches about on the land."<sup>23</sup> Blaming herders and livestock owners for degradation makes little sense, then, in a context where "non-place-based" factors yield only the narrowest range of livelihood options.

Conservation bureaucrats and water engineers ultimately must learn Blaikie's lesson when they are led further and further into the upstream catchment in their efforts to produce water commodities, concerning themselves with the micropractices of herders and livestock far away from the urban center. They are led from the reservoirs to the eroding slopes above the reservoirs, to the alpine wetlands above the slopes, to the political institutions that manage grazing, to the ideas of herders that graze the animals, and to the forage preferences of sheep. Each step upstream takes them further from the South African core, and yet in a sense each points back toward it.

Across Lesotho's transition from labor reserve to water reservoir, the politics of land use and degradation have remained more or less in place. Nonsustainable multispecies livelihoods, a tenuous politics of distribution, land degradation, and soil conservation are architectural features of a regional political economy: the (by-)products of Lesotho's historical experience as an apartheid storage reserve. Water production is fundamentally a racial project, then, even as it masquerades as economic exchange. Before water flows through tunnels and pipes into South

Africa's wealthy gated homes and through prepaid water meters in impoverished townships, it carves paths through the soils upstream, entraining sediment from headwaters to reservoir. The Lesotho Highlands Water Project "might bury itself in a few decades,"<sup>24</sup> along with millions of South Africans who depend upon it. All buried by the sediment of a system of storage and extraction. Water is a gift that destroys.