



Major river systems are intrinsic to the long economic histories of the regions they transect. However, although the Tana River basin covers 20 per cent of Kenya's land mass, the river itself, in terms of water volume and vital economic functions, is not the kind of waterway one associates with the world's famous rivers. This, however, does not diminish the Tana River's historical importance, which is critical to understanding the larger background against which the High Grand Falls Dam project is being framed.

Insofar as the three major rivers spanning the eastern highland-lowland gradient share the same highland water catchments and are also linked within the Vision 2030 policy framework, the case of the Tana cannot be examined in isolation from the Athi-Galana and Waso Nyiro North systems. The Athi-Galana takes a route similar to the Tana, skirting the contours of Kenya's eastern highland-lowland gradient, but is often only a trickle by the time it reaches Malindi. The flow has been further reduced following the establishment of the one-million-acre Galana irrigation scheme bordering Tsavo East National Park. For people depending on Malindi's tourism sector, this is a positive development as the drop in volume reduces the siltation of local beaches, a problem that contributed to the rise of Watamu as an alternative beach holiday destination. Before the scheme started, tourism sector stakeholders were advocating a plan to reroute the river to an outlet north of Mambrui.

The historical evidence indicates that most of the seasonal streams of northern Kenya and the coastal hinterland were permanent rivers before Africa's shift to the drier climatic regime that occurred around the middle of the 13th century. The Waso Nyiro was once this region's mightiest river, judging by the large watercourses like the Malgis *laga* (Swahili for dry watercourse) descending from the highland areas of Samburu and Marsabit that fed into it and the channels it carved out north of Magogoni in Lamu. Both Magogoni and Dodori, both of which are next to the site of a proposed coal-powered plant, are much larger than the channel where the present-day Tana River meets the sea. This may also be due to the fact that some of the lower Tana's waters disappear into the lakes and wetlands of the Tana Delta. The Delta is a [uniquely varied ecosystem](#) that supports a wide variety of habitats, including riverine forest, grassland, woodland, bushland, lakes, mangroves, dunes, beaches, estuaries and coastal waters.

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The Waso Nyiro now terminates at the Lorian swamp near Modo Gashe, but this too has changed over the past three decades. Its water often fails to reach Lorian due to the expansion of commercial farms and small-scale irrigation upstream. During most years, it often ends at a small outpost called Gotu; during extended droughts the flow is so reduced that animals in Samburu, Shaba, and Buffalo Springs reserves upstream can be seen drinking from puddles along its banks. The 1000-kilometre-long Tana River's greatest attribute, against this backdrop, may be that it continues as a permanent watercourse transecting a long stretch of semi-arid lowlands before reaching the coast.

The rise and fall of coastal settlements

The current condition of the three rivers linking Kenya's eastern gradient to the Indian Ocean and the current focus on exploiting them close to their highland sources distract both from their important role historically and equally critical contribution to the livelihoods of the diverse communities downstream.

A thousand years ago, the region these rivers bisect were connected to the Shungwaya economy, whose main hub was located at Bur Gao, now a small town across the Kenya-Somalia border. Although colonial historians described Shungwaya as a kingdom, later work established that it was actually a trade network that linked the early Swahili city-states to the African interior as far as Lake Turkana.



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The volume of water these rivers carried was less important than their role as conveyors of people and their domestic animals, and trade. [The Shungwaya economy](#) catalysed the shift of coastal settlements to a maritime culture around a thousand years ago, when they became part of the growing Western Indian Ocean economy. All of this contributed to the



process of creative syntheses giving rise to the Swahili language and culture, a distinctively African urban society characterised by its strong tradition of co-evolutionary interaction.

The decline of Shungwaya, attributed to the climatic shift mentioned above, coincided with the 13th century rise of the [Ajuran Sultanate](#), a centralised state that exploited the Juba and Shebelle rivers to develop Africa's only case of a hydraulic empire. The Ajuran presided over extensive irrigation works and constructed an extensive system of wells and cisterns that allowed them to control their nomadic Somali and Orma neighbours and a swathe of territory extending across much of southern Somalia to eastern Ethiopia. The Sultanate, whose capital was located at Afgoye, collapsed during the 17th century, but the system of agricultural production and taxation remained in place until the 19th century.

The large volume of agricultural produce and other commodities supported the rise of Swahili port towns like Mogadishu, Merca, and Barawa on the Benadir coast. The inland networks that expanded through the influence of Shungwaya and the Ajuran Sultanate funneled a range of products to coastal towns that were exported to metropolitan hubs like Baghdad and Cairo; before long the commodities began reaching India, and eventually found their way to Venice and Lisbon. The codification of [mercantile capitalism under Islam](#) was an important enabling factor in both cases.

The wealth and reputation accompanying the growth of coastal settlements arising across the eastern Africa littoral between Mogadishu in the north and the Rovuma River in the south attracted the interest of the Chinese. The forty-ship fleets of large vessels commanded by the famous [Admiral Zheng He](#), who led two expeditions between 1417 and 1422 to the region the Arabs dubbed the Land of Zinj, was significant even by today's standards.

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The rivers also played a role in the migrations of the proto-Meru, who abandoned their settlement on Manda Island following the onset of Portuguese hegemony. Their migration



up the Tana covering several generations, and the interactions en route and after their crossing of the Tana into what is now Tharaka, underpinned their own process of creative syntheses, leading to the development of what is arguably Africa's most sophisticated agro-permaculture system based on a multigenerational concept of environmental resource management that predated the Western embrace of sustainability by over two hundred years.

In his insightful 1989 book, *Identities on the Move*, Gunter Schlee documents how similar dynamics influenced pastoralist clans and niche adaptations in northern Kenya. Herders in the Lake Turkana area established contacts with the coast centuries ago, and following a large environmental calamity overtaking present-day Marsabit County over five hundred years ago, a number of clans sought refuge on the coast. This interaction left an imprint on the indigenous orientation of coastal Islam, which in turn is reflected in the religious practices of the Gabra and Rendille, who integrated the five daily Islamic prayer cycle into their own monotheistic belief system. There are three Bajuni clans of northern Kenya origin, and the Bajuni *sorio* purification ritual is a variation of the Rendille ceremony known by the same name, even though there has been no contact between the two communities for several hundred years. By the same measure, when Meru miraa traders began showing up in Lamu after independence, the Bajuni welcomed them as *watu wa Pwani* in recognition of their coastal origins.

The false Kenya A-Kenya B dichotomy

The details of these historical interactions preserved in the traditions of these communities are indicative of the dynamic qualities of the cultural ecologies and pre-colonial political economy that developed in the river basins linking the coast to the mainland. The coast-mainland divide instilled during the colonial interlude is a false dichotomy in contrast, and these examples are also cited in order to posit that there is an alternative developmental model to the top-down planning imported by the colonial state.

The Tana River inscribes a long arc defining the border separating modern Kenya from the vast lowland expanses of "Kenya B" (a terminology used by the inhabitants living north of the river to describe themselves when making a distinction between them and "Kenya A" inhabitants south of the river). The region's diverse cultural groups formed an economic mosaic that was beginning to enter a phase of proto-state formation during the late pre-colonial era. Similar developments were beginning to gather speed across much of what is modern day Kenya during the latter half of the 19th century. Imperial intervention short-circuited these processes, and with far-reaching ramifications for the inhabitants of Kenya B.



In the case of the coast and the lower Tana River hinterland, the unremarkable village of Kipini is emblematic of the lower Tana hinterland's decline following the destruction of the Witu Sultanate and its satellite settlements in 1895 by a British expeditionary force. The population living within Witu's fortified town walls was more than 50,000 at the time. The prosperous Sultanate welcomed slaves running away from the plantations run by the pro-Busaidi Lamu elite, and minted its own currency and postage stamps.

The irony of the Sultanate's fall is that its demolition was triggered by the death of German loggers during an altercation that broke out after they racially abused their Swahili co-workers. The British were not happy that Witu had engaged their imperial competitors, but the killing of Europeans was a precedent they could not allow to go unpunished. Eliminating the Witu Sultanate solved two problems: it eliminated opposition to their imperial intrusion, while the agricultural collapse that followed allowed the British to annex the Lamu mainland as Crown Land.

The reduction of Witu's population to just a few thousand people a century after its destruction is indicative of the malaise that spread across the larger region following the imposition of colonial rule. Decades of stasis became the basis for the region's post-colonial marginalisation and social exclusion.

A similar trend overtook the ecologically and historically similar Juba River basin to the north in Somalia, with the exception of the commercial banana production that became Somalia's only agricultural export industry. While traditional pastoralism dominated the large expanse between the Tana River and northern Somalia, these island ecologies contributed to the symbiotic relationships sustaining the livestock economy.

Prioritising dam building and state irrigation schemes over the livelihoods of communities long present in the region is a variation on the mono-culture developmental model Syad Barre attempted to implement in Somalia's Juba River basin. [Michael Maren](#) elucidated the resulting conflicts in his book, *The Road to Hell: The Ravaging Effects of Foreign Aid and International Charity*, and things went further downhill after its publication in 1997.

The current highland-lowland division symbolised by the Kenya A-Kenya B dichotomy is an anomaly in regards to the socio-economic dynamics illuminating the historical record. It manifests in the problematic record of large-scale projects and other planned interventions across the region. The simple fact of the matter is that the larger lowland-coastal economic landscape discussed here once attracted settlers and refugees from across the seas rather than being an incubator for famines, clan warfare, and political turbulence. This explains [one observer's](#) speculations that life in southern Somalia may have better four hundred



years ago than it is now.

There are indications that the larger region bordering the Ethiopian and Kenyan highlands is recovering its mojo. However, many of the problems and historical injustices addressed by Kenya's new constitution could have been avoided if the policy prioritising investment in high potential areas had been extended to the high potential economic sectors in Kenya's neglected regions. But they were not, and if the Vision 2030 Big Water policy dominates the template for the area falling north of the Tana River, it may turn out to be a case of the worst is yet to come.

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We can only imagine the counterfactual scenarios that may have occurred if the local societies were in a position to manage the transition on their own terms.

Hydraulic states and rain-based social organisation

Water has been used as a mechanism of control since the rise of the earliest state systems. In a book called *Oriental Despotism*, Karl August Wittfogel developed the concept of [hydraulic empires](#), which were expansionary states that flourished in the ancient world. Hydraulic states emerged in ancient Mesopotamia, the Indus Valley, pre-Columbian Mexico and Peru, and Egypt. These states' power was based on their control of water. Hydraulic states gave rise to impressive public works and statuaries that remain up to this time, and transformed kings into demi-gods and pharaohs.



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The hydraulic state is best understood as an ideal type based on environmental determinism. Debates generated by the concept led critics to argue that the hydraulic empires of antiquity were based on pre-existing central political organisation that enabled the rulers to expand their power through irrigation and water infrastructure. Marx and Engels' [Asiatic Mode of Production](#) is another variation on the theme that emphasises a rigid and impersonal state's monopoly of land ownership, political and military power, or control over irrigation systems.

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Regardless of the order of events, domination through the control of water is a recurring idea that has resurfaced in science fiction like the [Dune series](#) and post-Apocalypse scenarios like *Mad Max: Fury Road* and contributes to the growing genre of [eco-disaster films](#) and other works of fiction.

Areas dependent on rain, in contrast to these examples, tended to give rise to decentralised social structures based on clans, segmentary lineages, age-set organisation, local councils, and other horizontal structures. This kind of organisation supported mobility, resilience, and the sharing of risk-spreading and coping strategies across diverse communities. Range



scientists have associated the problem of unpredictable rainfall and high levels of uncertainty with the opportunistic exploitation of natural resources—a proclivity that comes with an obligation to share and redistribute. While this opportunism is embedded in pastoralist societies, variations on the same “make hay while the sun is shining” meme, is also observable among their neighbours, and in discussions with civil servants and politicians.

Economies conditioned by rainfall dominated across most of eastern Africa and the Horn, the exception being the secondary states represented by the intra-lacustrine kingdoms. The configuration of small states in present-day Uganda, Rwanda, and Burundi were the product of agro-pastoralist syntheses that, consistent with our discussion, were enabled by stable environmental conditions and plentiful water.

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Such variations highlight the influence of environmental forces and shared social orientations on regional political economies. Hard-nosed planners and developmental experts will dismiss the narrative presented here as a historical fairy tale with no relevance for the present. There are, however, multiple examples of how the forces of nature and historical pathways reassert themselves during periods of system transitions, and there are multiple signs from all over the region that the region’s periphery is entering a [phase transition](#) that will render many of their plans and projects irrelevant.

Gunnar Myrdal released his influential book, [Economic Theory and Under-developed Regions](#), around the same time Wittfogel published *Oriental Despotism*. In his analysis, the same elements of resource control central to hydraulic empire also guided Europe’s colonisation of much of the global South. Colonies were resource-rich areas located on the periphery, and the imperial project focused on the extraction and control of these resources. This was accomplished through a type of agro-managerial despotism that parallels the example of hydraulic empires.

The post-colonial states in this part of the world have become vehicles for a maladaptive combination of the opportunism embedded in rain-fed systems and the rigidity of hydraulic



states. Kenya's water management is symptomatic of the larger imbalance between the center and the periphery. This helps explain the militarisation of northern Kenya and why the Tana Delta became one of the primary incubators for the Mombasa Republican Council's secessionist agenda.

Following the present state-based pathway is likely to lead to more of the same - not a good idea when alternatives exist.

Post-colonial water hangover

During the late 1970s, the Government of Kenya announced that it was committed to delivering potable water to every Kenyan household by the year 2000. This goal proved elusive and the target date passed without comment or controversy. The task appeared simpler than it actually was, and acknowledgement of this now comes with the awareness that management of water from above can also be a source of disease, death, and regime change.

The designation of water as a basic human right guaranteed by Article 43(1) of Kenya's 2010 Constitution replaced that ambitious technocratic objective with a lofty principle but one that will not be attained because the operationalisation of water rights is a function of four factors: availability of the resource; investment in delivery and distribution systems; technological innovation; and the policy and planning process.

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Nailing the process should be the easy part, but this has not been the case as the first two installments of this series documented. Lessons learned for developing water resources cited in one [USAID case study](#) highlight the importance of exposing decision makers to alternative institutional arrangements and successful models of service delivery involving local stakeholders, embedding frameworks for mediating conflicts, and devolving management to local institutions.

The Kenya government's US\$25-billion LAPSSET corridor scheme, whose objectives include



the transformation of the lower Tana River basin, is a product of the exact opposite mentality. The problem is not the roads and the infrastructure, but the hegemonic policies that have long treated the larger region as an unproductive expanse requiring developmental planning from both without and above.

The High Grand Falls Dams project on the Tana River reinforces this assumption by minimising the import of the project's impact on the communities downstream, and failing to acknowledge the value of livelihood strategies fine-tuned to the region's environmental and infrastructural conditions. The lack of consultation with minority communities appears to be standard procedure, even for non-controversial projects, like the expansion of [geothermal electricity generation](#) at Ol Karia.

Unlike electricity, water cannot be generated, only conserved. In the case of Kenya, the water is there. Developing the delivery and distribution infrastructure and maintenance is the hard part. Constructing local dams where appropriate is obviously an important option; to this end, the government identified a [number](#) of Arid and Semi Arid (ASAL) sites for water storage development.

Marsabit is an important highland island in the middle of a large desert. Residents suffer from protracted water shortages aggravated by degradation of the mountain's cloud forest. The Badassa Dam was initiated in 2009 to alleviate the problem. It is an example of a worthy project that enjoyed the full support of the local community, especially after some 1,000 goats keeled over and died after drinking water from an old well. Like in the recent case where eleven rhinos died after being moved to the Tsavo, the problem was due to seasonally high concentrations of minerals, according to [subsequent analyses](#). The dam became another case study of how badly things can go wrong.

Construction of the Badassa Dam, which is designed to hold 5 million cubic metres of water, stalled in 2011. Design flaws and the shoddy work of the government-appointed contractor led to a court case in 2013. Contrary to [the ruling](#) of one of several court cases, the wealthy Marsabit businessman who filed the suit ended up taking over the project. Things went badly again, resulting in major losses for the new contractor, who was forced to sell property in Nairobi to survive after being forced to go into hiding. In another stroke of irony reminiscent of the Tana River's shift away from the Hola Irrigation Scheme, [The Standard reported](#) in 2014 that Badassa Dam's source of water had dried up.

These finance-draining dam stories continue to pile up across the country. The Crocodile Jaws Dam in Isiolo presents another variation on the same theme. There's no need to describe it - just watch the Oscar-winning animated film [Rango](#). The movie shares the same



water-grabbing plot line – the diversion of precious water away from the town to support the big money resort, or the LAPSET tourist city in this case, but probably without the Hollywood-style ending.

Meanwhile, the flooding of the towns next to the Tana River earlier this year was not due to the heavy rains, but due to the [siltation of the Masinga dam](#) that has proceeded at a rate six times the level anticipated when the dam was built.

Smart technology and precision agriculture

The problem remains. A [2017 study](#) reports the proportion of Kenyans with access to clean water is declining, in part due to population growth outstripping the government's capacity to provide. This highlights the array of [small-scale water catchment solutions](#) now taking root in places like Makueni, Isiolo, Samburu, and even in Kusa along the shores of Lake Victoria that feature enhanced rocky outcrop water catchments, sand dams, and home water storage tanks and dams. Such scale- appropriate developments and growing pace of technological innovations across the world are revising path-dependent approaches to water.

The [Slingshot water purifier](#) can turn the water from Lake Turkana or the from the polluted Nairobi River into super purified medical quality water. The machine, which is the size of a crate of soda, can purify 1,000 litres per day and costs US \$35. There are inexpensive nano filters for water bottles with pores small enough to catch viruses. This tech is the best bet for eliminating the ubiquitous plastic water bottles that actually do not guarantee safe water and are choking the oceans. Even the traditional toilet, a water wasting device that has not changed for 130 years, is being redesigned to recycle the water and to use the waste to recharge your mobile phone while sitting on the throne.

Agriculture consumes 70 per cent of the world's water. Experts predict a range of innovations from smart grids and self-repairing pipes to high-tech irrigation systems that will reduce the water used by over 30 per cent. These developments are fast tracking the growth of precision agriculture, an approach to production that utilises an array of components ranging from sensors to soil surveys and variable rate fertilization. The future of Kenya's food security is precision agriculture, not large irrigation schemes. Large farms on the slopes of Mt Kenya are implementing precision agricultural methods, enabled by the growth of companies offering the requisite support services. Players in the contract-farming sector are introducing precision agricultural practices to medium-sized growers in the lower zones, and it is only a matter of time before this spreads to areas like the lower Tana River with its untapped potential for small- and medium-scale agro-pastoral development.



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[Ari.Farm](#) is an exemplar of developments of the new economy emerging in war-torn areas after decades of stasis and conflict. Using a very original business model based on subscriptions from the community, the firm is a magnet for diaspora capital that has established greenhouse farms and camel dairies in Somalia's riverine area to supply Mogadishu. Ari.Farm also has a farm in Kenya that is delivering camel milk to Nairobi. The ubiquitous goat, which is resistant to capital-intensive mass production, is becoming the [high-end animal protein](#) of the future, and Ari.Farm just may turn out to be the dryland's version of [Eastleigh's Garissa Lodge phenomenon](#).

Fourteen counties on Kenya's periphery have come together to form [The Frontier County Development Council](#), predicated on a "holistic and integrated approach to promote and strengthen inter-regional linkages". The Council is one example of developments behind the region's shifting system state. Human capital investment and provision of basic infrastructure in these high potential but historically marginalised zones, together with symbiotic linkages to pastoralist capital, can transform the larger region. The lower Tana and its invisible stakeholders should be given the chance to become part of the process leading over time to a new diversified [river valley economy](#), and a sanctuary where all the bird watchers of the world will congregate.

This is only the beginning. The road will be difficult, but a dynamic confluence of capital, culture, and technology will see the influence of the [post-post-colonial African mode of production](#) in the former Shungwaya region become water under the bridge. This is the point in the process when the stakeholders can determine what form of upstream water management should be undertaken.