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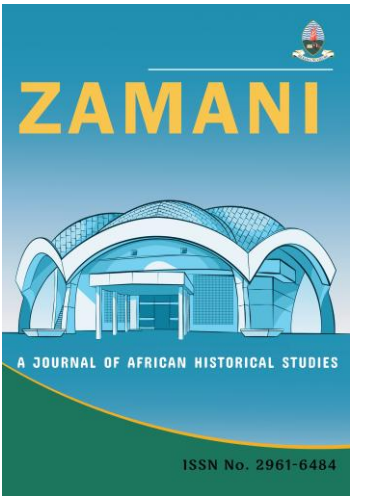

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Research Article: 'Sold Down the River': Histories of Production, Trade, and Transport along the Waterways of the Kilombero Valley, Tanzania.

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‘Sold Down the River’: Histories of Production, Trade, and Transport along the Waterways of the Kilombero Valley, Tanzania

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Abstract

This article considers the centrality of waterways in the Kilombero Valley of Tanzania to the region’s histories of development from above, particularly in terms of infrastructure, crop production, trade, and transport. Early colonial investigations hoped Kilombero’s riverine system might prove a navigable link from the coast to the Southern Highlands. The British colonial era instead focused more on utilising riverine networks for internal goods transport. Throughout these colonial visions – simultaneously ambitious and naïve – the prevalent dug-out canoe was considered unsafe, inefficient, and replaceable by modernised methods. But the canoe – a symbol of indigenous knowledge and practice – prevailed in the wake of failed efforts to effect such change from above. Kilombero’s waterways are indelibly entwined to its environmental, social, and economic landscapes, yet efforts by colonial powers to establish systems of river transport – whether to transport produce from valley depths towards railheads and markets, or as part of wider networks – were repeatedly frustrated. This article first offers a survey of this period of flawed development efforts, and then considers how perspectives on waterways as infrastructure shifted into the postcolonial era through ambitious schemes for hydropower and irrigation, when visions for rail and roads replaced rivers as the means for systematic conveyance. Waterways also complicated communications, and successive governments neglected the impacts of waterways and their annual inundations on the mobility of local communities. While floods brought agricultural fertility, they also destroyed crops and isolated communities, threatening lives and livelihoods. As a coda, the article notes how the first bridge over the Kilombero was only opened in 2018, ending decades of regional isolation and a stream of fatalities from ill-fated ferry crossings, highlighting this contested environment in which much of life was defined by its waters.

Keywords: valley development, infrastructure, waterscapes, Kilombero, Tanzania

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Introduction

The alleged agricultural potential of the Kilombero Valley captured the imaginations of developers from the 1870s. As such, it has since become a site of both blueprint development visions and tailored schemes.[1] Throughout this history, one theme proves constant. Water. Its sources; its uses, whether for irrigation or transport; its volume; its power and potential – both to create and destroy – and for the power it could generate. Investigations throughout the German colonial era (1885–1918) hoped the Kilombero River might prove a navigable waterway for flat, stern-wheeled steamboats from the coast to the temperate and fertile Southern Highlands, throughout which hopes for prosperous German settlers were hung. But successive visions throughout the British colonial era focused less on through traffic, and more on utilising the valley's riverine networks for the internal transport of rice and cotton grown by local farmers. Colonial efforts to establish various systems of river transport met with limited success; both in terms of ferrying produce from valley depths towards railheads and markets, or as part of wider networks. The dominant mode of river transport in the valley was the long-standing and prevalent dug-out canoe – or *mtumbwi* – but this was considered unsafe, inefficient, and bound to be replaced by modernised methods, or so went the colonial thinking. Efforts to effect such change ultimately failed, and the *mtumbwi* prevailed. On one level, then, this illuminates an example of the triumph of prevailing indigenous knowledge.

This article also considers how perspectives on waterways as transport infrastructure shifted into the postcolonial era, as rivers became central to ambitious schemes for hydropower and irrigation. Centralised visions for rail and roads replaced rivers as the means for systematic conveyance of goods and people. But waterways continued to complicate communications to, from, and within the region. While floods brought agricultural fertility, they also held potential to destroy crops, isolate communities, and threaten both lives and livelihoods. This valley region remains a contested environment in which much of life has historically been – and remains – defined by its waters. The eponymous Kilombero River –

[1] Jonathan M Jackson, *Visions for an African Valley: Histories of Development in the Kilombero Valley, Tanzania since 1877* (James Currey, forthcoming).

once described as "both the fairy godmother and the ogre of the valley"[2] – was essential for cultivation *and* its paramount threat. In 2018, the first bridge over the Kilombero replaced the ferry points at Kivukoni, south of Ifakara, ending decades of isolation and frequent ferry-related fatalities. Through such examples, this article emphasises the centrality of Kilombero's waterways to local economies and their shifting roles within colonial and postcolonial development planning.

The history of development in Kilombero, however, is mostly a history of unimplemented ideas. It has stood for over a century among those areas of Tanzania which have experienced a high intensity of development attention.[3] The levels of financial investment envisaged for Kilombero by governments and state actors were consistently among the highest projected in the country, but the scale of this forecasted expenditure was part of the reason why various visions never materialised.[4] The full extent of historical attention is not apparent to visitors to the valley today. These histories emphasise potential and promise, with Kilombero "recognised as agriculturally one of the most promising areas"[5] in advisory reports throughout the twentieth century. During investigations into building a railway to the south-west of the country, it was declared:

[2] The National Archives of Tanzania, hereafter TNA, 61/782/21: Agricultural and Communications in the Ulanga Valley, 1943.

[3] Ibid.

[4] This was true from the German era, through the British period, and to the postcolonial era. Governments, agencies (such as the FAO), and development consultants all proposed high levels of capital investment.

[5] The National Archives of the United Kingdom, hereafter UKNA, CO 691/141/2: Memorandum by Secretary of State, November 13, 1934. Examples of an emerging literature on so-called 'failed futures' include Brian Goldstone and Juan Obarrio, "Introduction: Untimely Africa," in *African Futures: Essays on Crisis, Emergence, and Possibility*, eds. Brian Goldstone and Juan Obarrio (Chicago: University of Chicago Press, 2016); Clemens Greiner, Steven van Wolputte, and Michael Bollig, "Futuring Africa: An Introduction," in *African Futures*, eds. Clemens Greiner, Steven van Wolputte, and Michael Bollig (Leiden: Brill, 2022); Detlef Müller-Mahn, Kennedy Mkutu, and Eric Kioko, "Megaprojects – Mega Failures? The Politics of Aspiration and the Transformation of Rural Kenya," *The European Journal of Development Research* 33 (2021): 1069–1090.

> It is impossible to exaggerate the great and outstanding importance from the point of view of railway revenue, of this vast low-lying tropical plain, extremely well-watered from the slopes of high mountains which shut it in on three sides, with a fairly reliable rainfall, and very easily served by a comparatively cheap line.[6]

This highlights how high agricultural potential was thought to justify the building of a railway, while its waterscape – its "fairly reliable rainfall" and being "extremely well-watered" – drove this potential. Moreover, colonial plans viewed Kilombero's rivers as providing the complementary transport infrastructure to serve a railway through transshipment points.

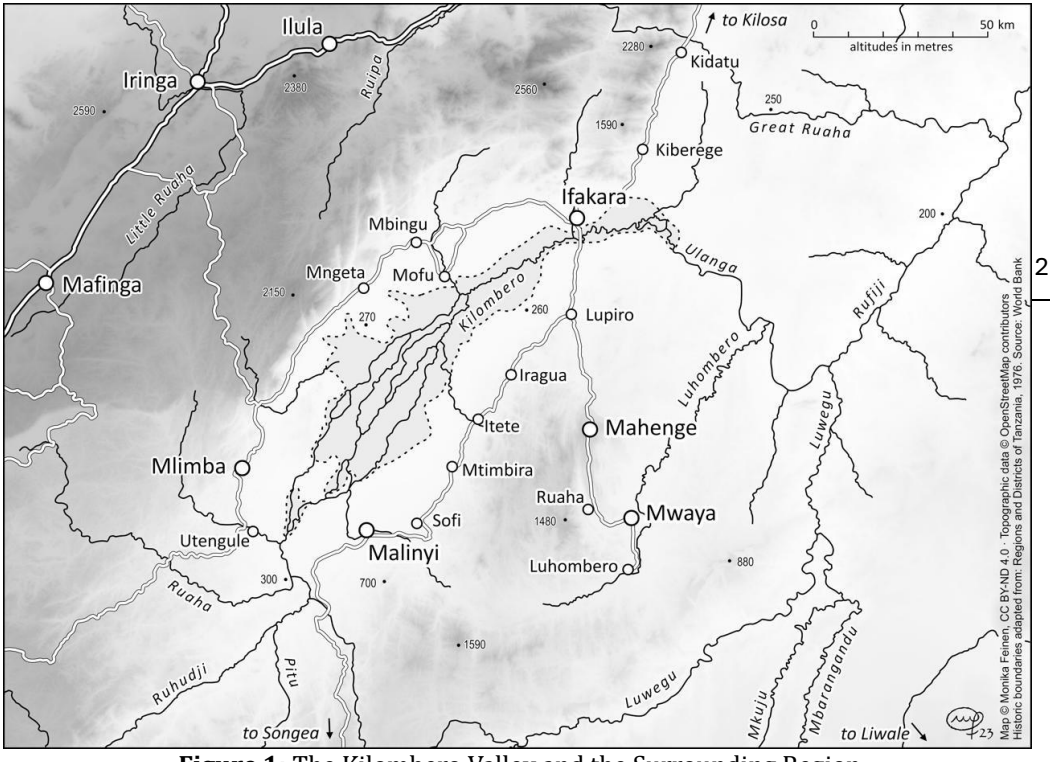

Figure 1: The Kilombero Valley and the Surrounding Region
Source: Courtesy of Monika Feinen

[6] Clement Gillman, *Report on the Preliminary Surveys for a Railway Line to Open Up the South-West of Tanganyika Territory, 1929* (London: Crown Agents, 1929), 43.

Early Colonial Visions: The German Period

The era of German East Africa (1884–1918), first sewed notions of vast agricultural potential and future possibilities into the seams of imperial minds. Following a 1908 expedition, Captain Heinrich Fonck declared:

> One must see with one's eyes the astounding fertility and inexhaustible potential of this region, which has been favoured by its abundant water supply, in order to be able to say without exaggeration, 'the Ulanga will become our Nile, if we wish it'.[7]

Governor Gustav von Götzen, believed that rice fields of the "fertile Ulanga Plain"[8] were "endlessly expandable"[9] and was confident that the valley could provide rice for the entire colony. In 1897, Philipp Engelhardt and Georg von Prittwitz und Gaffron were commissioned by Governor Eduard von Liebert to establish whether the Kilombero river system provided a navigable waterway for flat, stern-wheeled steamboats, now that the highlands had been 'won' following fierce fighting and resistance led by Chief Mkwawa.[10] The plateau was thought healthy, fertile, and suitable for European settlement if an adequate and inexpensive route to the coast could be established. These were the first technical surveys to focus specifically on the Kilombero River and its tributaries. "The exploitation of our large East African colony", Engelhardt wrote, "is made extremely difficult by the lack of transport routes." But Engelhardt also believed that "under full and proper exploitation of the fertile lowlands, it alone could supply the entire

[7] Author's translation from TNA, G7/100: Schiffbarkeit des Rufiji, Band I, H Fonck, "Bericht über die wirtschaftlichen Verhältnisse in der Ulangabene und ihren Nachbargebieten," January 15, 1908. Kilombero was known to German colonists as 'Ulanga,' and the terms are synonymous.

[8] Gustav Graf von Götzen, *Deutsch-Ostafrika im Aufstand, 1905–06* (Berlin: Dietrich Reimer, 1909), 104.

[9] Ibid.

[10] See Alison Redmayne, "Mkwawa and the Hehe Wars," *The Journal of African History* 9, no. 3 (1968): 409–436.

protected area with grain."[11] This is a crucial comment for its role in forming the origin story of Kilombero as a breadbasket; an image perpetuated, rightly or wrongly, for over a century.

During the subsequent Maji-Maji Uprising (1905–1907) the region had been a significant area of conflict. In the theatre of war, the natural geography of the landscape plays a role. In guerrilla warfare tactics, such as those used against German forces, the natural environment is weaponised. Local knowledge of landscapes can facilitate mobilisation, movement, and concealment. Familiarity with complex river systems can be utilised to evade capture or mount attacks. The waterways of Kilombero were no exception. Boats used for ferry crossings at established points were often hidden, preventing appropriation by German forces; whereas ferry boats at the river crossing south of Ifakara were destroyed, which frustrated troops from reaching Mahenge.[12] The rushing Kilombero River posed a barrier too dangerous to cross with hastily-built rafts. Great detours were necessary if the river was to be crossed at all, while each side was critically cut off from the other. These acts did not alter the outcome of the rebellion, but they highlight how the impassability of the river possesses a form of latent agency for its influence on human actions. The river itself was non-partisan, as it restricted the movement of German forces, so did flood damage contribute to famine suffered by rebels. Its duality was a reckonable force.

The impact of Maji Maji was acutely felt by the environment and communities. Soon, however, ideas returned for exploring the region's potential to provide food and labour to sisal and rubber plantations. Moreover, suppression of the rebellion led to widespread famine, and the stimulation of agriculture in areas with the potential for high yields and diverse productivity became vitally important. Construction of the Central Line railway from Dar es Salaam to Kigoma, which began in 1905, increased rice exports from the valley, and once the line reached Kilosa in 1909, this railhead brought markets closer. But despite this, Kilombero itself remained

[11] All quotes translated by author from Philipp Engelhardt, "Meine Reise durch Uhehe, die Ulanganiederung und Ubena über das Livingstone-Gebirge zum Nyassa," in *Beiträge zur Kolonialpolitik und Kolonialwirtschaft, Dritter Jahrgang, 1901–1902* (Berlin: Deutsche Kolonialgesellschaft, 1903), 69.

[12] Götzen, *Deutsch-Ostafrika*, 114.

remote with a skeletal transport infrastructure. The practical requirements of fulfilling the new developmental philosophies of this period were predicated on effective transport above anything else. Two principal issues would preoccupy the German and British periods of administration. Firstly, the prevailing belief was that to develop agricultural production then transport facilities must first be developed. But the form and scale of transport infrastructure depended on perceived levels of production, and therefore it was important to ascertain expected levels of return on the capital investment required. Railways were generally accepted as key to economic progress, but they were not cheap to build or run. The second and connected consideration is whether there was a level of natural production that warranted capital investment in an extensive transport infrastructure; or rather, was there a potential for future production that would only be realised if this were first provided?

A 1908 account by Heinrich Fonck stressed the "constant need to look again and again for ways of supporting and accelerating [...] development."[13] Emphasis was placed on regions whose production could reduce imports of foodstuffs "such as rice from India in particular, first for the indigenous population of the colony and later, if possible, for the homeland."[14] At this time, approximately 2 million rupees' worth of Indian rice were annually imported to German East Africa, while Germany itself imported rice from British India to the annual tune of 40 million marks. Perhaps the Kilombero Valley could help solve this problem. German colonists saw in its great plain "the future larder of the colony"[15] and that, "the Ulanga Plain promises more!"[16] Calculations believed it possible to increase current rice production fifty-fold for a total of 25,000 tonnes by harnessing the water and controlling the flood.[17] Management involving reservoirs and artificial

[13] Bundesarchiv (The German Federal Archives), hereafter BArch, R1001/278/66–84: Heinrich Fonck, "Bericht über die wirtschaftliche Verhältnisse in der Ulangaebene und ihren Nachbargebieten,"Dar es Salaam, January 15, 1908. Author's translation from German.

[14] Ibid.

[15] BArch, R1001/278/66–84: Fonck, "Bericht über die wirtschaftliche Verhältnisse"

[16] Ibid.

[17] Current production (in 1908) was given as 1,000,000 centner and potential production as 50 x 100,000 centner, or 5 million centner. One German centner is equivalent to 50 kilograms, thus 25 million kilograms or 25,000 metric tonnes.

irrigation through river draining, pumping, and water lifting systems were envisaged. "Such a system," wrote Heinrich Fonck, "would hardly be able to find a more grateful field in the colony as here in Ulanga."[18] But he had little idea how to design such a system, yet envisaged steam ploughs could cultivate the plain. Fonck also believed further areas of rice cultivation and additional crops such as cotton, maize, sugar cane, bananas, sorghum, sesame, and sweet potatoes would also expand.

It was thought that by utilising Kilombero's waterways to connect the coast and the Southern Highlands, this connection would draw neighbouring areas into an emerging economic sphere. The role of Kilombero therefore continued to be considered within broader interregional contexts, particularly in relation to the 'opening up' of the southwest, but no significant transport schemes had yet been implemented. Nevertheless, Ifakara and Mahenge had been developing as significant entrepots since the late-nineteenth century, driven by Indian merchants.[19] Now that the nearest railhead at Kilosa was a mere 185 kilometres from Ifakara, the economic possibilities of the valley attracted European settlement. One Hamburg firm – the Ulanga Reis- und Handelsgesellschaft – was established in the early 1910s in Ifakara, whose aim was "to buy, mill and sell large quantities of rice, later branching into retail trade, cotton ginning and rubber cultivation."[20] This company anticipated extraordinary opportunities presented by the possible construction of a railway from Dar es Salaam to Lake Nyasa, and arguably not without reason. A survey of rice production in the valley area published in 1908 estimated a district yield of 3,750 metric tonnes for the main harvest with a second harvest of approximately half this, and identified 28 varieties of rice, each adapted to specific soils, sites, and seasons.[21]

[18] BArch, R1001/278/66–84, Fonck, "Bericht," 1908. Author's translation from German.

[19] On Indian merchants and firms, see Martha Honey, "Asian Industrial Activities in Tanganyika," *Tanzania Notes and Records* 75 (1974): 55–70; Robert G. Gregory, *India and East Africa: A History of Race Relations within the British Empire, 1890–1939* (Oxford: Clarendon Press, 1971), 485; see also Dharam P. Ghai, ed., *Portrait of a Minority: Asians in East Africa* (Nairobi: Oxford University Press, 1965).

[20] Lorne Larson, "A History of the Mahenge (Ulanga) District, c. 1860–1957" (PhD diss., University of Dar es Salaam, 1976), 140.

[21] Karl Braun, "Der Reis in Deutsch-Ostafrika," *Berichte über Land- und Forstwirtschaft in Deutsch-Ostafrika* 3, no. 4 (1908): 204–206.

Figurative and literal inroads to Kilombero were being built due to the repositioning of German progressive and 'enlightened' policy in this period of economic imperialism as the valley was beginning to be seen through different eyes. Possibilities for investment were envisaged. Fresh visions recast the valley within the ever-increasing levels of interconnectivity between different regions. By 1914, Kilombero's position as a promising area for development had taken hold. Early murmurings of its agricultural potential were being converted into real enterprise and the framework for a growing economy was being laid down. But this chapter of history – for Germany, for German East Africa, and for Kilombero – ends in 1914 with the declaration of war as conflict begins to ravage the region once more.[22]

Visions under Mandate

The era of British administration of Tanganyika as a League of Nations mandate (1920–1946) threw continued interest onto Kilombero. A 1926 memorandum impressed its dormant potential. The region was "virtually going begging"[23] through its "never-failing flood-periods"[24] and "continually adequate rainfall"[25] over a "rich, constantly renewed alluvial soil"[26] on which two crops of rice are grown every year. Furthermore, a "great output of maize and beans, and more rice from the lower lands of the valley slopes"[27] would be possible due to the valley's consistent rainfall and its irrigation possibilities from "the abundant, perennial water supply."[28] A survey was commissioned and conducted by Alexander Telford, but his findings were

[22] For accounts of World War One in Mahenge, see Larson, "History," 209–217; and Jamie Monson, "Agricultural Transformation in the Inner Kilombero Valley of Tanzania, 1840–1940" (PhD diss., University of California, 1991), 285–290. For a history of the conflict on the continent, see Edward Paice, *Tip and Run: The Untold Tragedy of the Great War in Africa* (London: Weidenfeld and Nicolson, 2007).

[23] TNA, 11746: "Memorandum on Two Fertile Regions Awaiting Development, September 23, 1926," by A. H. Kirby, Director of Agriculture.

[24] Ibid.

[25] TNA, 11746: "Memorandum on Two Fertile Regions."

[26] Ibid.

[27] Ibid.

[28] Ibid.

not positive.[29] These, he knew, would be viewed as "undoubtedly pessimistic"[30] but while the "general impression"[31] received from most officials was that "the Kilombero plains were marvellously fertile"[32], Telford held that "this view cannot be supported."[33] Despite this pessimism, belief prevailed. During a Commission held to explore possible routes for a railway to Lake Nyasa, valley potential remained a focus. By its nineteenth session, the Commission admitted it had "received very little reliable information from verbal witnesses in regard to the Kilombero area, its population, production and prospects".[34] One local official addressed this, describing a region where rice cultivation flourished for local consumption, but with limited trade. Quantities were proportionate to market access, prohibited by distance, cost, and risk.

Nevertheless, between 1918 and 1930, the number of rice gardens cultivated by each farmer quadrupled.[35] Surplus rice was often carried on foot over the escarpment to Iringa, Tosamaganga, and as far as Malangali. However, most market rice was purchased by local agents of Indian merchants in Ifakara. Each merchant contracted four or five local sub-agents throughout the valley who bought rice and sent it by canoe to Ifakara. This was precarious, but in most cases the risk was met by the trader, not the farmer. The trader bought the rice at source, hired the canoe, and paid the wages of the three men required to transport up to 1.5 tonnes of rice (being each canoe's capacity). This was not a safe and stable system. Risk influenced price and yield. Such risks included water damage, leaking canoes, whole harvests lost to the riverbed by submerged trees, and life-threatening attacks by hippopotami. It was reported that in some areas, there was "no incentive to cultivate"[36], whereas cotton areas had been

[29] Alexander M. Telford, *Report on the Development of the Rufiji and Kilombero Valleys* (London: Waterlow, 1929).

[30] Letter from Telford to MacIntyre, December 19, 1928, in TNA, 13304.

[31] Ibid.

[32] Ibid.

[33] Ibid.

[34] Tanganyika Railway Division, *Appendices to the Report of the Tanganyika Railway Commission Containing Oral Evidence and Memoranda* (London: Crown Agents, 1930), 156.

[35] Ibid., 66.

[36] Tanganyika Railway Division, *Appendices to the Report*, 96. At this time, the nearest ginnery was at Kilosa, 185km from Ifakara.

"killed for the future by transport"[37], with necessarily low prices in Ifakara due to its distance from Kilosa. Ifakara thus received valley produce by river, and from Mahenge by road. For the latter, contemporaneous figures held that between March and December, fourteen Indian traders cleared all produce by running twenty-eight trucks between Mahenge and Ifakara on one day, returning the next.[38]

There was a two-fold issue of transport: first to Ifakara, then to Kilosa. A functional transport network existed in Kilombero, but it was far from developed, efficient, and economic. The region was fertile but isolation tempered growth. Transport infrastructure was characterized by poor or inexistent roads, limited motor transport, damage to bridges during floods, precarious canoe transport, and labour- and time-consuming head porterage. The crux remained whether expenditure on a railway line was justified, so far as it rested on *potential* and not *current* production in a region whose population was frequently cited as being too low to effectively realise this potential. The Commission recommended the construction of a branch railway from Kilosa to Ifakara, through "fertile and well-watered country suitable for cotton, sisal, and maize"[39], and it was believed rice production in Kilombero would increase if better prices were offered through cheaper transport. Beyond this, it was believed the district would be developed sufficiently by better roads and improved water transport, as canoe transport was "costly, uncertain, and dangerous"[40]. The Commission also recommended a further expert investigation into improving river navigation. A survey of the Kilombero River was shortly begun under Captain Gibson – recently retired from the Royal Navy – who arrived in Ifakara in July 1931 to cover 110 miles of the river. This proved too ambitious. Gibson surveyed a meagre half a mile daily. Progress was slowed by "the unsurveyed nature of the surrounding country, the restriction of view by the long grass, the lack of natural marks along the banks of the river

[37] Ibid., 156.

[38] Ibid., 63.

[39] Tanganyika, *Report of the Tanganyika Railway Commission* (London: Crown Agents, 1930), 11–12.

[40] Ibid., 14.

and the difficulty of fixing marks in floating reeds."[41] Gibson concluded that "no difficulty should be found in navigating a vessel 120 feet long and 30 feet broad that can draw as much as 2.5 feet"[42], but that a full report was essential, one that explored the rest of the river and in flood. The survey remained incomplete when Gibson left, anxious that his assistants continued the investigation; but they never did.

In 1931, Governor Stewart Symes succeeded Donald Cameron, who had assumed the post in 1925 and spearheaded the policy of indirect rule in colonial governance. Symes recalled Cameron's "progressive schemes for the indigenous population of Tanganyika"[43] – and Kilombero was a significant part of this vision. But at his succession, "Tanganyika, a poor country, undeveloped and depending increasingly on export of raw materials, was caught, like so many other countries, in the trough of a world-wide financial depression."[44] The global economic landscape had dramatically altered, which in turn altered colonial visions of development. By 1932, then, and through no lack of effort, the landscape and economy of Kilombero since the advent of British administration had remained largely unchanged. There is an argument, however, that the 'failure' of wholescale intervention was, in fact, far from detrimental. Efforts to effect 'progress' and 'development' were, after all, colonial efforts imposed from above, and much of what was envisaged for Kilombero and its people would have been just that: an imposition.

The "Lure of the Map"

After the abandonment of the river survey, a consolidating memorandum by the geographer and engineer Clement Gillman was written on the navigability of the system. It sought "to arrive, if possible, at a definite

[41] UKNA, CO/691/115/7: 1st Report from Gibson to GM, Tanganyika Railways, September 3, 1931.

[42] UKNA, CO/691/115/7: Railway Commission: Survey of Kilombero River, 1931.

[43] Stewart Symes, *Tour of Duty* (London: Collins, 1946), 162. Cameron was Governor from 1925-1931.

[44] Ibid., 163.

conclusion with regards to the navigability of the Kilombero River and to its usefulness towards the development of the plain"[45] and continued:

> The lure of the map and more particularly of the early inaccurate and of the small-scale map, has since the earliest days of European occupation ever and again stimulated hopes and projects for the utilisation of the Rufiji-Kilombero system, either as a whole or in parts, for the purposes of inland navigation.[46]

This "lure of the map" is a compelling image. Its enticement applies not only to the river system for transport, but to the wider valley as an area of high development potential. The strength of the lure varied, as did the character of visions for the valley. By this time, however, ambitious German proposals for elaborate irrigation schemes, to train the river, improve its bends, and even lower its bed, were disregarded. Gillman had long doubted German calculations and assumptions and whether economic gains justified the required expenditure. Telford confirmed these doubts, but the prospect of greater utility of the river for produce transport prevailed. Despite limitations, it was thought that an experimental river service between Kotakota and Ifakara – fed by canoes on the tributaries – could begin immediately. Further surveys of all channels, lakes, and swamps were advised. Self-registering gauges were recommended, and the accurate determining of levelling, cross-sections, depths, and velocities was vital. An aerial survey was suggested to better understand the "mosaic of the many water-courses" and to eliminate unsuitable river channels that a ground survey could not detect. Periodic surveys would also provide important data on "the tendencies of the various channels to shift their beds."[47]

For the reconstruction of development histories in Kilombero, this was an important memorandum that blends objective facts with subjective perspectives. It reveals much about the valley, but more about colonial thinking. For Gillman, comprehensive technical knowledge was paramount.

[45] UKNA, CO 691/125/17: Memorandum on the Navigability of the Kilombero River System, 1932.

[46] Ibid.

[47] All quotes here from UKNA, CO 691/125/17: Memorandum on the Navigability of the Kilombero River System, 1932.

He avoided generalisations and conjecture, seeking to base judgements on evidence. Conscious of wasted expenditure over grave mistakes, Gillman was wary of roseate optimism. His motive for writing the memorandum was to "put a stop to all contemplation of such a scheme."[48] There was a responsibility to writing such memoranda, but recommendations were not executive. They were advisory, never authoritative. The burden of decision-making lay elsewhere. This allowed for both scepticism and optimism to be exaggerated, the extent of either varied between interpretations of differences between technical possibilities and colonial possibilities. Neither were fixed. Technical capabilities could be abstracted and only improved towards the future; whereas colonial possibilities were contextually fixed, highly variable, and widely contingent. Solutions to problems could always be proposed, especially with unlimited finance and resources. These tended towards the kind of utopian thinking that Gillman, for one, regarded as pointless. It was technically possible to canalise the Kilombero, lower its bed, train its course, and contain its flood; but that was not the point. It was technically possible to run a steamship between two points on the river, but was it worthwhile and would it show a return on the investment?

By the end of 1932, however, all capital expenditure throughout Tanganyika was suspended. Tanganyika could not "afford to continue railway construction, and must rely on motor transport to open up new areas."[49] As the 1930s progressed, in some circles there was even uncertainty as to whether Tanganyika could be returned to Germany. Governor Sir Harold MacMichael addressed these fears and the path out of retrenchment in 1935:

> There is a great future for Tanganyika, but our work can only be done well if it is done with confidence in its durability. There are three essentials to success: first, vision to foresee the potentialities of the future and to realise opportunities when they present themselves; secondly, vigour to grasp the

[48] Clement Gillman, "A Short History of the Tanganyika Railways," *Tanganyika Notes and Records* 13 (1942): 53.

[49] Cyril Ehrlich, "Some Aspects of Economic Policy in Tanganyika, 1945–60," *The Journal of Modern African Studies* 2, no. 2 (1964): 271; Sydney Armitage-Smith, *Report on a Financial Mission to Tanganyika* (London: HMSO, 1932), 85.

> opportunities and press forward to prosperity; and thirdly, confidence in ourselves as a nation and in the future of Tanganyika.[50]

This was high rhetoric amid harsh realities. MacMichael detailed eleven road-building schemes with a projected cost of £250,000. The most expensive (£78,000) was the Kilosa-Ifakara road.[51] "The first idea was to develop the Kilombero Valley by [river] navigation"[52], MacMichael explained, but "the difficulties were so great that it was decided to tap the area by road."[53] This was "a potentially rich cotton, maize, and rice district"[54], he parroted. The road's construction was "based on the promise of future production"[55] in a valley considered by the fund committee "to be agriculturally one of the most promising areas in the Territory particularly as regards the production of cotton and rice."[56] The nub was that its then productivity could not justify the large sum required to bring a railway to Kilombero. Moreover, proposals for river transport between Kotakota and Ifakara were deemed unwise due to the projected costs of shaping and maintaining the Kilombero for navigation. Risks associated with water transport were thought to negate any gain from economic efficiency.

Trade and Transport

The limit of production for any commodity is measured by the amount carried to market. Increases in buying facilities increase productivity. Buying posts were therefore encouraged by the administration. "With better transport facilities"[57], one official believed, "it is very probable that there would be an increase in the number of trading posts leading to increased competition for the rice crop, better prices and therefore increased

[50] UKNA, CO 691/141/2: Extract from *East Africa* Magazine, July 4, 1935.

[51] £68,000 would be spent locally and £10,000 in Britain.

[52] UKNA, CO 691/141/2: Extract from *East Africa* Magazine, July 4, 1935.

[53] Ibid.

[54] Ibid.

[55] UKNA, CO 691/141/2: Report of a Committee Appointed to Consider Schemes for the Development of the Territory, September 15, 1934.

[56] Ibid.

[57]UKNA, CO 691/141/2: Memorandum on Kilosa-Ifakara-Kotakota Road Scheme, September 15, 1934.

production."[58] In 1940, however, it was thought that the introduction of formal markets in Kilombero throughout the 1930s *reduced* rice production.[59] Rules and regulations discouraged farmers who preferred informal trade. Nevertheless, production remained contingent on market and transport infrastructures. In most cases, roads were built or improved as a response to higher production rates. The creation of efficient access to markets also incentivised greater yields, especially in fertile areas. Increases in cash crop production and broader transport infrastructure development certainly benefited the imperial economy, while positive impacts on African well-being were negligible. The binding of Kilombero farmers to colonial economies removed their capacity for innovation and ability to maximise opportunities.[60] Colonial efforts to produce cash crops thus came at "the expense of economic activities that would have proved more useful to economic development"[61] of the region itself by its own farmers. This mattered little to the Anglocentric industrialist, who perceived cotton production and its transportation as vital to *his* future and not that of the farmers far removed from the metropole. For example, the President of the Manchester Chamber of Commerce declared that "Lancashire's future depends largely upon the amount of cotton which can be produced within the Empire. What could be more disastrous than that the development of the industry in one of our most promising colonies should be prevented through the lack of transport facilities?"[62] This extraversion' of African economies by colonial interests is central to understanding how colonial governments, by implementing processes of so-called positive 'development', ultimately effected detrimental underdevelopment.[63]

[58] Ibid.

[59] TNA, 61/141/H/Vol. I: Handing Over Report – October 1940. In 1940, produce markets were established at: Ifakara, Kiberege, Mofu, Mbingu, Mgeta, Kotakota, Ngombo, Malinyi, Utengule, and Kilosa kwa Mpepo.

[60] Mkeli Mbosa, "Colonial Production and Underdevelopment in Ulanga District, 1894–1950" (master's thesis, University of Dar es Salaam, 1988), 135.

[61] David Sunderland, ed., *Communications in Africa, 1880–1939: Volume I* (London: Pickering & Chatto, 2012), iii.

[62] "Development of Tropical Africa," *The Manchester Guardian*, October 24, 1925.

[63] See Gareth Austin, "African Economic Development and Colonial Legacies," *International Development Policy* 1 (2010): 11–32.

The lack of local transport facilities in Kilombero was of far greater consequence to its inhabitants than to the looms of Lancashire. In a land divided by rivers, bridges were symbols of connection. Canoe crossings would always serve the wider rivers and could bear heavier loads, but a network of bridges created interconnectivity between otherwise separated areas. Each year this layer of infrastructure was exposed to the mercy of the flood. Bridges washed away, restoring divisions. Each January, many larger bridges were stripped of their decking and road bearers to save a complete rebuild later, usually possible only once floods had subsided.[64] Therefore, from January to June, practically all roads in the district were impassable for motor traffic due to the flood and ruination of wooden bridges.[65] As nearly all roads crossed rivers and streams, the re-establishment of communications in Kilombero after the rains was not so much a road problem, but a bridge problem. Mahenge was often isolated for up to eight months in particularly wet years, but motor transport to areas served by suitable roads was usually possible by mid-August. Until then, only head porterage could suffer otherwise impassable roads. Even the 'all weather' Kilosa-Ifakara road was defeated in 1940 after heavy rains in April-May. One official exasperated, "I know no more difficult country to maintain roads in."[66] Each year the pendulum of change swung far in Kilombero. The forces of nature and humankind shared the valley, each taking turn to rule. Deluge brought refuge, and receding waters launched processes of restoration. Roads were repaired, bridges rebuilt, areas were brought out of isolation, rivers could be crossed, and the region fully reunited. But this was not a closely connected region at the best of times.

Formal river crossings by official ferries generated significant income for local treasuries. Crossings on frequent routes and through significant rice centres were particularly important, but canoes and pontoons were not

[64] The scarcity of timber in some areas either stymied or prevented the rebuilding of damaged bridges.

[65] TNA, 61/141/G: Handing Over Report: Mahenge District, July 1934.

[66] TNA, 61/141/G: Handing Over Report: Mahenge and Kiberege Districts, November 8, 1932. Tax defaulters' debt often converted to free labour, frequently to restore roads after the rains.

always well maintained.[67] In late 1937, ferries over the Mnyera and Ruhuji Rivers were "a source of danger owing to their construction"[68] and their rebuilding was urged. The most important ferries were those over the Kilombero and Ruaha Rivers. These were maintained by the Mbunga Native Administration and operated solely from its treasury funds, but with this responsibility came great risk. To mitigate this, in 1932 it was proposed that the ferry service over the Kilombero be taken over by the Public Works Department. This would decrease Mbunga revenue by £325 (from £898) per annum and was protested by the District Officer (DO).[69] From 1939, however, formal rules governing the ferry were laid down, ostensibly for its safe operation. These regulations included: hours of operation from 6am to 6pm daily; closure to motor traffic during the wet season from March to July, the specific dates to be set by the DO; maximum permitted loads; and centralised control of the crossing point through the strict prohibition of any other conveyance of people or goods five miles up- or downstream of the pontoon.[70] These directives also ensured fares were duly captured. In 1941, it was again proposed that the Public Works Department take over its running due to a belief that "the responsibility and risk taken is too great to be borne by a Native Treasury the size of Kiberege."[71] Compensation and the cost to replace the ferry's canoes were discussed, but its operation was not transferred.

Due to traffic increases during harvesting months, the ferry, on occasion, ran after dark at double the rate with a 50 per cent wage increase to ferrymen.[72] Efficiency gains could be swiftly lost to heightened risk of accidents. In 1941, the firm Vithaldas Haridas and Company (VHC) requested the ferry be kept open until 10pm during the cotton season. This

[67] Letter from District Office [Mkasu] to Provincial Commissioner [Mahenge], August 27, 1929 in TNA, 61/134/G

[68] Letter from Acting Provincial Commissioner, Eastern Province to District Officer [Kiberege], November 22, 1937 in TNA, 61/134/H.

[69] Letter from Acting District Office [Kiberege] to Provincial Commissioner, Eastern Province, January 18, 1932 in TNA, 61/134/H.

[70] TNA, 61/134/H/9: Draft Rules for Kilombero Ferry, January 31, 1939.

[71] Letter from Provincial Commissioner, Eastern Province to Director of Public Works, April 29, 1941 in TNA, 61/134/H/16.

[72] District Office [Kiberege] to Provincial Commissioner, Eastern Province, September 30, 1941 in TNA, 61/134/H/26.

exemplifies how the initiative, capital, and forward momentum behind crop marketing and transport relied on individual firms.[73] These were exclusively Indian-owned, and this trading community played a crucial role in the development of economic and transport systems.[74] In 1930, there was no industry so to speak, and a lack of convenient markets discouraged increased agricultural production. Driven by opportunity and entrepreneurial capitalism, the 1930s saw a proliferation of Indian traders establishing trading centres, ginneries, rice mills, and organised transport. The colonial government kept enterprise in check, but for an administration on a hamstrung budget, it was indispensable.

"Proving a failure" – the Experimental River Service

In 1941, discussions reopened on the potential for a river service. A memorandum framed the proposal in historical context, from early German suggestions for navigation and "at various times grandiose schemes"[75] for canalisation, to continued considerations by the British administration. Following improvements to the Kilosa-Ifakara road, it was believed "too little attention has been devoted to the provision of transport facilities in the valley above Ifakara."[76] Calculations were made. In 1941, production of seed cotton and rice was an estimated 350 tons apiece, and it was thought 100 tons of each could be marketed through centres set back from the Kilombero River, leaving the remainder as potential tonnage for a river transport service. At a rate of 30 shillings per ton, expected revenue from 500 tons was £750. Due to wartime conditions, it was thought impossible (and detrimental to the war effort) to obtain specially designed craft. In any case, it was undesirable to spend capital too lavishly on an experimental service.[77] But more pressing work led Tanganyika Railways to "regret it will not be

[73] Provincial Commissioner, Eastern Province to District Officer [Kiberege], September 22, 1941 in TNA, 61/134/H/26.

[74] Mbosa, "Colonial Production," 87.

[75] TNA, 61/635: "Memorandum No. 58 by the General Manager to the railway advisory council regarding a transport service on the Kilombero River" (Ref. No. 920), May 19, 1941. The main productive area of the valley was said to lie approximately 100 miles above Ifakara.

[76] Ibid.

[77] Ibid.

possible to undertake a service [...] during 1941"[78], with assurances that preparations would be made for the 1942 season. In February 1942, one lighter and a motorboat were sent to Kilombero. An overview of produce centres and their markets was prepared alongside a map showing the primary tributaries to be served. This revealed the volatility of Kilombero's rivers, as the DO remarked that "the course of the river appears to have changed somewhat in recent years (c.f. Ruhuji, Mpanga and Kihanji) and that accurate identification has therefore been somewhat difficult."[79] Navigational limits also varied throughout the year. Mofu on the Ruipa River, for example, could only be reached at the height of the wet season; and towards the end of the dry season, after unusually light rains in 1941, Ngombo was unreachable, whereas it could ordinarily be reached throughout the year.

Produce markets serviceable by the river service were divided into three zones according to their production tonnage, proximity, and accessibility to the Kilombero River, and suitable transhipment sites. Ngombo fell within 'Zone A,' alongside Utengule, Kilosa kwa Mpepo, Malinyi, and Kotakota. These markets were prioritised due to their heavy tonnage and their location on the river itself or near its headwaters. Produce from Mofu, Mbingu, and Mgeta was either transported to Ifakara by road, or brought down by canoe from the Ruipa, Mgeta, and Kihansi rivers. These markets were considered as 'Zone B,' and their incorporation into a river service depended on either: a) whether the vessels could navigate Kilombero's tributaries; or b) the ease of transhipping on the Kilombero itself. 'Zone C' included the markets of Majiji, Mtimbira, Itete, Rufiri, Madabadaba, and Iragua. These were to the south of the Kilombero and produce mostly reached Ifakara by road. Their incorporation into the scheme was due to the cost of lengthy road haulage, but problematic due to their location relative to the river. It was also uneconomic to transport produce from 'Zone B' to Ngombo for transhipment, and canoe transport along existing tributaries was not established due to there being no

[78] Letter General Manager Tanganyika Railways to Provincial Commissioner, Eastern Province, September 4, 1941 in TNA, 61/635.

[79] Letter from District Officer [Kiberege] to Provincial Commissioner, Eastern Province, February 10, 1942 in TNA, 61/635.

perennial streams along the right bank of the Kilombero, unlike those that flowed to its left bank from the Udzungwa escarpment. One solution was to build a new road from Madabadaba to below Kotakota, but this could not be immediately considered.[80] Such was colonial thinking then, and continued into the field of development planning: visions were first cast freely and at leisure, then ambitious proposals were made, but their implementation remained on distant horizons. The boat and lighter were trialled in April 1942 with the Kilombero in flood. The helmsman aimed to reach Ngombo but, after twenty-eight hours upstream, turned back when just six hours away due to low fuel. It then took just eleven-and-a-half hours to return to Ifakara. It was estimated the lighter would carry three tons of rice and consumed fifty-two gallons of fuel. This was "appalling"[81] as a lorry could achieve similar on twenty gallons. Financial loss was inevitable, but the DO remained optimistic. The river had been at its worst. It remained to be seen how the service performed once markets opened and produce became available.

By October 1942, however, the service was "proving a failure"[82] and close to withdrawn. Low water levels limited its run to only three months when six was expected. After generating only £100 in revenue against an expenditure of £1,000 it was a "complete failure"[83] and thought that "without proper arrangement of cotton buying posts, provision of storage accommodation at the river bank, and adequate roads to feed into the river, the traffic would not pass that way."[84] If the service could not run for six months, then it would lose revenue from cotton transport and be limited only to paddy and maize. High costs and poor results were "a waste of

[80] Letter from District Officer [Kiberege] to Provincial Commissioner, Eastern Province, February 10, 1942 in TNA, 61/635.

[81] Letter District Officer [Kiberege] to Provincial Commissioner, Eastern Province, April 23, 1942 in TNA, 61/635.

[82] Letter from General Manager Tanganyika Railways to Chief Secretary, October 6, 1942 in TNA, 61/635.

[83] Letter from General Manager Tanganyika Railways to Provincial Commissioner, Eastern Province, December 22, 1942 in TNA, 61/635.

[84] Ibid.

manpower and petrol"[85], and canoes were reconsidered the best transport until "a suitable higher capacity vessel can be obtained, designed for this class of work and running on cheaper fuel."[86] The Provincial Commissioner, however, thought that, as an experiment, it had been successful. "Taking a long view"[87] he explained, "it would appear in reality to be a success in that the service has proved that a lighter and tug can move up and down the Kilombero."[88] *This* was the object, not profit. "It would appear that the present lack of success of this service,"[89] he believed, "is entirely due to the unsuitability of the craft."[90] All this considered, the Chief Secretary thought the service was, in fact, "most useful"[91] and should be continued in 1943.

After 1943, the future of the Kilombero River Service was again in the "melting pot,"[92] but continued into the 1944 season. Two additional five-ton barges were trialled and overall operating costs confirmed "the impossibility of making the service pay with the current type of boats."[93] Increased rates would only be undercut by canoe transport; but more significantly, only 200 tons could be transported against a total regional production in 1944 of 1600 tons. This was an exceptionally high yield, but the prevailing feeling was now that the service was "clearly unnecessary"[94] with capacity "too small"[95] and pace "too slow."[96] Canoe transport also had

[85] Letter from General Manager Tanganyika Railways to Provincial Commissioner, Eastern Province, February 10, 1943 in TNA, 61/635.

[86] Ibid.

[87] Letter from Provincial Commissioner, Eastern Province to Chief Secretary, February 16, 1943 in TNA, 61/635.

[88] Ibid.

[89] Letter from Provincial Commissioner, Eastern Province to General Manager Tanganyika Railways, January 19, 1943 in TNA, 61/635.

[90] Ibid.

[91] TNA, 61/635, Provincial Commissioners' Minutes on Secretariat File: Transport Facilities on the Kilombero River, November 2, 1942; Letter General Manager Tanganyika Railways to Provincial Commissioner, Eastern Province, December 22, 1942 in TNA, 61/635.

[92] Letter from District Officer [Kiberege] to Provincial Commissioner, Eastern Province, November 30, 1943 in TNA, 61/574/13/47/Vol. I.

[93] Letter from District Commissioner [Kiberege] to Provincial Commissioner, Eastern Province, October 13, 1944 in TNA, 61/635.

[94] Ibid.

[95] Letter from District Commissioner [Kiberege] to Provincial Commissioner, Eastern Province, October 13, 1944 in TNA, 61/635.

[96] Ibid.

its share of issues. In 1943, there was unwillingness to transport produce to Ifakara due to low rates and "difficulties in [canoe men] getting their dues" from VHC.[97] Fair rates were agreed for the following year, payments swiftly made, and a fleet of 100 canoes transported 250 tons of grain per month from to Ifakara.[98] The DC viewed canoe transport as "'quite satisfactory"[99] and "the only method practicable,"[100] while regarding "further experiments in power transport as an unnecessary waste of money."[101] Nevertheless, a suitable substitution for the canoe was "a matter of the greatest importance for the future welfare" of Kilombero.[102] While uncertain and dangerous, it was no longer costly in comparison to the Kilombero River Service which – having existed hypothetically for years – proved an utter failure. The service was formally suspended in December 1944, "as neither the traffic nor the other reasons advanced justify [its] continued subsidy."[103]

The Rufiji Basin Survey, 1953-1963

Following World War Two, processes of knowledge production intensified; from localised investigations with a skeleton crew to highly technical, expensive, and internationally coordinated regional surveys. Kilombero featured prominently in major surveys and subsequent reports, culminating in the high-modernist Rufiji Basin Survey. Led by the Food and Agriculture Organization (FAO) of the United Nations, the final *Report to the Government of Tanganyika on the Preliminary Reconnaissance of the Rufiji Basin* was submitted seven years later and in seven volumes in June 1961.[104]

[97] Letter from District Commissioner [Kiberege] to Provincial Commissioner, Eastern Province, October 13, 1944 in TNA, 61/635.

[98] In 1943, it was estimated canoes transported 1000 tons.

[99] Letter from District Officer [Kiberege] to Provincial Commissioner, Eastern Province, October 13, 1944 in TNA, 61/635.

[100] Ibid.

[101] Ibid.

[102] Ibid.

[103] Letter from Chief Secretary to General Manager Tanganyika Railways, December 23, 1944 in TNA, 61/635.

[104] The volumes were: 1. General Report; 2. Hydrology and Water Resources; 3. Water Control; 4. Irrigation Department; 5. Mbarali Irrigation Scheme; 6; Geology; 7. Soils of the Main Irrigable Area.

The initial scope of the work was estimated to take only one year to complete, but after a short reconnaissance in 1953, a more extensive survey was justified. This was a major undertaking that represented significant technical, scientific, and international co-operation. The 'technical experts,' who swept the basin, aimed to gather more hydrographic and agronomic data than ever before. They were the new 'pioneers' assisting countries;

> in the process of economic development to reach their goal of better living, and who believed that without good statistics – and plenty of them – modern agriculture, industry, and commerce could not function as they do in the more technically advanced countries.[105]

The size of the core team varied throughout the period and ranged from two at its smallest, to forty-two at its largest. African assistants and additional employees took the full figure of personnel into the many hundreds. This was an international endeavour, as "all members worked together in a friendly collaboration for the future benefit of Tanganyika and the development of its resources."[106] The Tanganyika Agricultural Corporation (TAC) co-ordinated the administration of the survey and led its experimental agricultural work. Employees engaged on the scheme were therefore either under the direct auspices of the FAO, the TAC, or the Tanganyika Government. The survey's Terms of Reference were:

1. To investigate and appraise the value and feasibility of possible development programmes for the conservation and utilisation of existing water resources in the Basin by such measures as flood control, reclamation, drainage, and gravity and pump irrigation systems.
2. To prepare proposals on possible methods and systems of water utilisation in the Basin.[107]

Three regions were earmarked for investigation: the Lower Rufiji, the Kilombero Valley, and the Usangu and Pawaga plains of the Great Ruaha River. Principal aims were to investigate water control for the benefit of

[105] Gove Hambidge, *Story of FAO* (New York: Van Nostrand, 1955), 112.

[106] FAO, *The Rufiji Basin, Tanganyika: FAO Report to the Government of Tanganyika on the Preliminary Reconnaissance Survey of the Rufiji Basin, Vol. I, Part I – General Report* (Rome: FAO, 1961), 2.

[107] FAO, *Rufiji Basin Report*, 4.

local development, and its foci were flood control and irrigation for agricultural improvement. Hoag and Öhman have stated that the "'Rufiji Basin Survey marked the beginning of the formal planning of hydropower dams in the basin"[108], but a close reading of the reports reveals this to not quite be the case. The FAO explicitly stated that "hydro-electric power"[109] fell "outside of the Terms of Reference of the Rufiji Basin Survey, and therefore not included above [in a list of recommended reservoirs]."[110] The report mentions the *potential* for hydropower, however, and strongly suggests:

> an investigation of the future requirements and means of provision of hydro-electric power, covering the whole of Tanganyika, but including the various possibilities of power from dams at Stiegler's Gorge, Mtera, and, if practicable, other sites in the Rufiji Basin.[111]

Hydropower was never the driving motivation for the survey and the "generation of power should in no case prejudice the use of the works proposed, for flood control and irrigation."[112] Flood control and irrigation possibilities were the primary aims of the survey and, moreover, it was reported that "for most sites, control for the optimum generation of power would seriously affect the benefits for irrigation."[113]

In Kilombero, survey teams sought to establish river gauges to measure discharge levels throughout the year. Catchment area maps were compiled, and from August 1956, one team commenced the "very difficult search on foot of the tributaries of the Kilombero looking for water control sites."[114] This began with the Ruhuji, Mnyera, and Mpanga systems. The hunt for dam sites continued, as did hydrometric work to determine water

[108] Heather Hoag and May-Britt Öhman, "Turning Water into Power: Debates over the Development of Tanzania's Rufiji River Basin," *Technology and Culture* 49, no. 3 (2008): 641.

[109] FAO, *Rufiji Basin Report*, 18.

[110] Ibid.

[111] Ibid. For the hydropower development in Stiegler's Gorge see Emma Minja, "Imagining Hydropower: Transnational Narratives and Realities of the Stiegler's Gorge Project in Tanzania, 1960s-1980s," *Zamani* 1, no.1 (2024): 52–74.

[112] FAO, *Rufiji Basin Report*, 56.

[113] FAO, *Rufiji Basin: Vol. I, Part II – Draft Summary of Conclusions and Recommendations*, 7.

[114] TNA, 61/A3/9/A, TAC: Monthly Report for August 1956.

levels. Efforts to establish an automatic water recorder and ordinary gauge at the downstream limit of the flood area of the Kilombero at Swero River were often made under "impossible conditions" and "constituted a danger to staff working there" as they attempted to construct a 750ft cableway and car across the river; claimed to be the first of its kind in East Africa.[115] The Kilombero at Swero could reach 600 feet across "with many crocodiles"[116], but the first discharge measurements were successfully taken there in December 1959. Heavy rains and flood conditions in the basin often led to abandoned vehicles, and not all were recovered.[117] The dangers of wild game to survey members were very real. In 1959, the "wild game hazards were the worst ever encountered in the history of the Rufiji Basin Survey,"[118] when "one elephant, two rhino, and three hippopotami had to be shot in self-defence."[119] Hazards from buffaloes and even lions were also reported, "which sometimes attacked and disorganised the parties."[120] When a hippopotamus charged and upset a boat carrying a hydro-metrist, all records of measurements taken at several gauging stations were lost.[121] In April 1958, an African Survey Assistant employed on work in Kilombero was reported "missing, believed drowned,"[122] but "the accident occurred in off duty hours,"[123] which makes it no less of a tragedy, but one that was not held against the RBS.[124]

When Simansky, the FAO hydrometrist working in the Kilombero Valley, visited Rome and London in September 1957, he stressed the "urgent necessity of expediting the hydrological investigations of some of the important river valleys, such as the Kilombero"[125] and "the factors at

[115] TNA, 61/A3/9/A, TAC: Monthly Report for April 1958,

[116] Tanganyika, *Tanganyika Agricultural Corporation (TAC): Report and Accounts, 1958–59* (Dar es Salaam: Government Printer, 1960), 38.

[117] TNA, 61/A3/9/A, TAC: Monthly Report for January 1958.

[118] Tanganyika, *TAC: Reports and Accounts, 1958–59*, 37.

[119] Ibid.

[120] FAO, *Rufiji Basin Report*, 11.

[121] TNA, 61/A3/9/A, TAC: Monthly Report for September 1957.

[122] TNA, 61/A3/9/A, TAC: Monthly Report for May 1958.

[123] Ibid.

[124] Ibid.

[125] TNA, 61/A3/9/A, TAC: Monthly Report for September 1957.

present handicapping the progress of hydrological work were discussed."[126] These factors were given as primarily:

> The absence of all-weather bridges over the side rivers […] which restricts and at times makes communications impossible – the extremely arduous task as a result of the limited staff available for the carrying out of reconnaissance over the large area involved – the difficulty of obtaining reliable local assistance to augment the FAO Team of Hydrometrists – the incidence of floods, the presence of big-game and dense bush.[127]

Environmental, human, and animal obstacles conspired to frustrate attempts to command Kilombero by technical and scientific mastery. Nevertheless, a detailed plan for flood control and irrigation in the valley was drawn up. Investigations incorporated aspects of meteorology, photography and mapping, water development and irrigation, river gauges, aerial surveys, and soil maps. It was concluded that 824,000 acres of land were irrigable in the valley, but that "systematic irrigation is only possible if the flooding can be prevented."[128] The FAO report quoted Gillman's view that Tanganyika's rivers "did not lend themselves to major schemes of irrigation or navigation which might justify the costs of gauging their flows"[129] and deemed Gillman "clearly mistaken"[130] for his opinion that "had the unfortunate effect of inhibiting for a considerable time the starting of systematic observations of river flows throughout Tanganyika as whole."[131] But what kind of survey investigating the possibilities for water irrigation did not recommend schemes for water irrigation? Earlier surveys had also warned of the futility of large-scale flood control and irrigation schemes. But this is exactly what the report of the Rufiji Basin Survey (RBS) proposed. The FAO expressed that flood reduction and control was the only means by which conditions conducive to general development could be achieved. "It

[126] TNA, 61/A3/9/A, TAC: Monthly Report for September 1957.
[127] Ibid.
[128] FAO, *Rufiji Basin Report*, 14.
[129] Ibid., 5.
[130] Ibid.
[131] Ibid.

is not too much to say,"[132] stated the report, "that the economic and administrative future of these large, fertile, and important regions will be transformed. In no other way will this be possible."[133] In this imagined reality, however, mere flood control and irrigation could not transform the region. Transport and communications must also develop to export the vast quantities of produce available once Kilombero's waters were tamed. However, vastly improved roads were also required to carry construction materials for reservoir and irrigation works *into* the valley to begin with.

Contingencies abound in the RBS report. A kind of 'piecemeal' development was envisaged, which viewed the "whole process spread over many years, beginning with pilot schemes of modest size, which can later be enlarged and increased in numbers in the light of experience gained."[134] Despite this suggestion, the FAO appraised the potential area for irrigated agriculture in the Rufiji Basin as 1.5 million acres with a projected capital expenditure of £140 million.[135] In Kilombero, seven water storage reservoirs were proposed, although it was not suggested that all should be constructed and various combinations were thought possible. The largest reservoir proposed, presented as having the greatest benefit, was the Mkasu Reservoir on the Ruhuji River in the upper reaches of the valley.[136] Its given capacity was 1,470,000 acre-feet, it would cost £5,846,000 to build, and was expected to reduce flooding by 300,000 acres. This was far greater an area than could actually be developed. The population of the Kilombero Valley in 1961 was given by the FAO as approximately 56,000 people, but only one-fifth was thought would take up irrigated agriculture; therefore, existing numbers were sufficient to cultivate an irrigable area of only 22,000 acres based on ten-acre holdings for a five-person family.[137] "Ample numbers of cultivators could be found"[138], it was claimed, "from adjacent regions,

[132] FAO, *Rufiji Basin Report*, 70.

[133] Ibid.

[134] Letter from B.R. Sen, FAO Director-General, to Minister for Agriculture, Tanganyika, June 5, 1961," included in FAO, *Rufiji Basin Report*, n.p.

[135] Ibid.

[136] Dams and reservoirs for flood control and irrigation were also proposed on the Mnyera, Mpanga, Kihansi, Ruipa, Kigogo-Ruaha, and Lumemo Rivers.

[137] FAO, *Rufiji Basin Report*, 92.

[138] Ibid., 96.

possessing densely populated areas."[139] This echoes past solutions to the perceived problem of underpopulation. The assumption that cultivators would move, or be compelled to move, was partly responsible for undoing the scheme for syndicated development investigated by Telford.

The vision was monumental. Its scale surpassed all schemes proposed during the colonial era, when plenty were envisioned and repeatedly rendered unfeasible. This report had no such limitation. Anything was possible. It seemed that the bigger the dream, the better. The postwar and soon-to-be-postcolonial horizons were wider than ever before. The FAO forecast that the annual tonnage of crops from Kilombero would be 11,500 during the First Stage; 114,500 by the Second; and 850,000 after the Third.[140] By the application of scientific and technological expertise, enshrouding sheer conjecture, the possibilities were limitless. But the report was also noncommittal. Figures were "conservative" and "tentative" and only "closer observation and investigation of conditions over several years [could provide] the basis for a more certain appraisal."[141] In a letter to the Minister for Agriculture, the FAO Director-General advised that "it will be wise not to take definite decisions about any particular project until such investigations have been completed and fully considered."[142] These visions remained firmly on paper and have remained so for over sixty years.[143]

To the Present: Magufuli Bridge and a Road Over Troubled Waters

The most significant development in recent years dates to 2018, when the President of Tanzania, the late Dr John Magufuli, inaugurated a bridge over the Kilombero River bearing greater significance than most realise. It reportedly cost $27 million and stretches for 384 metres as an all-weather and all-year connection across a river that has divided this region for as long as it has been settled. It is both remarkable and unsurprising that this investment has only so recently been made. The question of whether to

[139] I FAO, *Rufiji Basin Report*, 96.

[140] Ibid., 74.

[141] Ibid., 52.

[142] "Sen to Minister for Agriculture," included in FAO, *General Report*, n.p.

[143] For a treatment of development histories in Kilombero from the late-colonial to early postcolonial era, see Jackson, *Visions*, 125-209.

bridge the Kilombero is an old one. In 1964, the FAO did not "recommend that present improvements should include the bridging of the Kilombero at Ifakara or elsewhere. A bridge would be exceedingly costly. The money could be better spent in other ways."[144] Construction of a bridge over the Kilombero at Swero was, however, under consideration by the Federal Republic of Germany in late 1964, yet unfunded.[145] This was, the FAO decreed, a "more distant project."[146]

But the frequency of accidents and deaths during ferry crossings into the twenty-first century became too tragic to ignore. At least 100 people were initially feared drowned (later reduced to 38) after the MV Kiu ferry capsized in heavy rains on April 11, 2002.[147] In January 2016, the MV Kilombero II ferry capsized during a rainstorm with 50 people on board, including passengers inside three vehicles ferried over the river.[148] Its sister ferry – the MV Kilombero – had been replaced as new in 2007 as part of a World Bank loan that enabled a new ferry costing €830,500 to be supplied by the Dutch firm Dutchmed International B.V.[149] It was also in 2007 that a feasibility study was carried out with a view to construct a bridge over the Kilombero. Construction was "justified because the current dependence on ferry transport across the Kilombero River is not reliable and poses a great risk to human life and their properties"[150] and would "reduce if not

[144] FAO, *Possibilities for Agricultural and Related Development in the Kilombero Valley* (Rome: FAO, 1964), 21.

[145] TNA, 601/CW.44194/67, Junior Minister to Regional Commissioner, Morogoro, December 31, 1964.

[146] FAO, *Possibilities*, 21.

[147] "Tanzania Ferry Sinking Kills 'at Least 100'," *The Irish Times*, April 12, 2002, https://www.irishtimes.com/news/tanzania-ferry-sinking-kills-at-least-100-1.419843 Accessed December 11, 2024.

[148] United Republic of Tanzania, "Sinking of Ferry at Kilombero River," *Crime and Traffic Incidents: Statistics Report, January to December 2016* (Dar es Salaam: 2017), 71.

[149] World Bank, *Implementation Completion and Results Report (IDA-38880) on a Credit in the Amount of SDR81.6 Million (US$122 Million Equivalent) to the United Republic of Tanzania for the Central Transport Corridor Project, Report No. ICR1299, June 19, 2010* (Washington DC: World Bank, 2010).

[150] United Republic of Tanzania, *Detailed Engineering Design of Kilombero Bridge and Its Approach Roads: Environmental Scoping Report Scoping Report, April 17, 2009* (Dar es Salaam, 2009), 1.

eliminate risk of accidents."[151] Conversely, one concern raised through public consultation was that there would be an increase in road traffic accidents. Another concern was that improved transportation could lead to "family breakup"[152] due to an "outmigration of men looking for business opportunities."[153] But the bridge was clearly a long overdue infrastructural fulcrum, which sadly did not materialise rapidly enough to avert the tragic accident in 2016, after which regular passengers and local residents recounted how "every year around this time people using the pontoon had been losing lives' during the heavy rains that continued to cut off the Kilombero and Ulanga Districts from one another."[154] The construction of the Magufuli Bridge thus closed a long chapter in the history of the Kilombero valley region. This significance was expressed in a speech given at the formal opening of the bridge, as Professor Makame Mbarawa – then Minister for Works, Transport, and Communication – declared: "We are writing history."[155]

Conclusion

Through a focus on its waterways alongside broader considerations, this article has presented Kilombero as one of the starkest examples of how colonial development programmes, in particular, were "doomed to failure because of errors, ignorance, misjudgements and simple misunderstandings on the part of developers."[156] What makes Kilombero so exceptional, however, is the sheer number of schemes envisaged for the valley that never materialised. An inordinate number of programmes were never given the chance to fail. They met their doom before materialising. Moreover, the "errors, ignorance, misjudgements and simple

[151] Tanzania, *Detailed Engineering Design of Kilombero Bridge*.

[152] Ibid., 9.

[153] Ibid.

[154] "Ferry accident foreseen," *The Citizen*, January 29, 2016, https://www.thecitizen.co.tz/tanzania/news/national/ferry-accident-foreseen-users--2545904 Accessed December 11, 2024.

[155] Press Statehouse, "Kipindi cha Uzinduzi wa Daraja la Magufuli na Barabara ya Kidatu-Ifakara," June 11, 2018, https://www.youtube.com/watch?v=uoVTWRQWozA. Accessed December 11 2024. Author's transcription and translation.

[156] David Anderson, *Eroding the Commons* (Oxford: James Currey, 2002), 6.

misunderstandings" evident in colonial development programmes continue to the present.[157] But 'failed futures' are subjective, such as they were impositions from above. For local populations, the 'failure' of such schemes preserved more favourable conditions in some respects. So-called 'development' is central to human progress, but its processes are finely balanced, its applications are multitudinous, and its characteristics are inherently contentious. All the while, Kilombero's waterways remain central to life in the valley for its communities, for its wildlife, and for its environment.

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[157] Anderson, *Eroding the Commons.*

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