

*Omeya:*

**Water, Work and Infrastructure in Ovamboland from 1915 to 1968**

**BENJAMIN VIGNE**

VGNBEN001

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## Abstract

This dissertation seeks to explore the ways in which the multiple layers of infrastructure and archive have been coconstituted in Ovamboland from 1915 to 1968 in an effort to store, circulate and redirect water and its knowledge, which in turn seemed to frequently escape and exceed them. In the existent historiography of Ovamboland, infrastructure has usually been taken as a passive background to policies, designs and intentions of an all-knowing colonizing state. In foregrounding infrastructure as its analytical object, this thesis attempts to challenge such self-images of the state, to complicate the standard political chronology of rule, and to examine the various ways in which technical assemblages were both constituted by and productive of broader social, political and economic configurations. Methodologically, the dissertation is attentive to the spiral and palimpsestic nature of infrastructure – in other words, the ways in which new layers of infrastructure had to necessarily rely on, adopt and adapt to older sociotechnical strata. This awareness also allows the work to interrogate the received binary between the Europeans and the natives, pointing instead at their multiple entanglements and imbrications.

The first chapter looks at the early attempt of the South African officials to master the underground borehole and well technology, and shows how in the process of extending their political and economic control over the hydroscape, they were necessarily reliant not only on local labour but also on indigenous

knowledge and experience. The emergent borehole and well infrastructure of the region was critically connected to older social, political, epistemological and technical forms, and embedded in entrenched configurations of cattle, agriculture and land. The second chapter, as it were, moves closer to the surface in order to analyse the production of dam infrastructure as a form of famine-relief work, and eventually the introduction of the Tribal Trust Fund System. It shows how this dam infrastructure, while drawing from precolonial designs and local knowledge, established and acted out new relations between money, grain and labour. Crucially embedded in the colonial refashioning of 'tribal' economies, the financial infrastructure of the Tribal Trust Fund System, superimposed on the well and dam infrastructure, was devised to operationalise a particular managerial regime of the flows of labour, grain and cash. The third chapter looks at such forms of water infrastructure where the state took a more centralised and developmental approach. It shows that in the attempts to manage the water infrastructure in a self-described scientific and technical manner, the new infrastructure still necessarily adapted to and adopted earlier knowledge, techniques and practices, while older layers of infrastructure continued to operate beside and within it. This chapter explores how the introduction of major canals and hydro-electric power generation led to a new intense developmentalist approach by the state where attempted to design a total integrated water infrastructure and economy.

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I came to this topic through an interest in rainmaking that goes back to my childhood. My closest friend's father, Tatekulu Helao Shityuwete, was born in the village of Evale in southern Angola. He comes from a long lineage of rainmakers and I was lucky enough to grow up hearing stories of this magic. Helao packed his stories with the force of truth, belief and magic. I am so grateful to Helao for sharing his magic, wisdom and love with me. This thesis has been written with you, Jane, Tuli and Freddy constantly in my thoughts.

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## Glossary

- Efundja* The annual seasonal flood that flows from Angola southwards through the IISHANA into the Cuvelai basin. It varies greatly in its regularity, timing, duration and strength.
- Omuramba* A large and very wide river bed that can carry a significant amount of seasonal water from rains and floods and also holds that water for a long time after.
- Oshana*  
(pl. *iishana*) A narrow shallow channel that merges with and diverges from other shall channels to form a widespread network that carries seasonal floodwaters southwards from Angola into the Cuvelai floodplain.
- Pan* A shallow round depression in the ground that usually contains a clay basin and retains shallow pools of water after rains or floods.
- Vley* A lower lying area between raised areas, which tends to collect and channel surface water.

*Omeya ogo omwenyo* is an Oshiwambo saying that translates to ‘water is life’. Over the last decade or so, this phrase has become the slogan of government projects on water management in the Cuvelai-Etosha Basin in central-northern Namibia.<sup>1</sup> The slogan emphasises the primacy of water to human life and an undisputed desire to access it. It suggests that the Namibian government and the Oshiwambo-speaking people who live in the area are bound together as one entity in agreement that ‘water is life’. In this way, water is framed as an invaluable resource that this unified entity can access by scientific and technical means. In this thesis, I seek to explore the question of water in this area historically – to understand the changing ways that people have lived with water and to question the seemingly inanimate, neutral and technical nature of the infrastructure produced in relation to it.

In this thesis, I refer to this area as Ovamboland, which is the name that colonial officials used to denote the central-northern part of South West Africa during the period under study. Water has been acknowledged as a vital element in every history of Ovamboland, yet has remained conspicuously in the background. It has been conceived of as a timeless medium existing somewhat outside of history, or as a resource for or a barrier to human action. Similarly, the infrastructure produced in relation to water has been confined

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<sup>1</sup> “Water is Life – Omeya ogo omwenyo”, CuveWaters Mid-Term Report, 2013. <http://www.cuvewaters.net/fileadmin/edit/Downloads/Publications/CuveWaters-mid-term-report-2013.pdf>, visited on 12.06.19.

to the background – too mundane, too uneventful, or even too technical to be considered a serious subject of history.

Water and infrastructure, however, play a much more active role in shaping the world than these histories elicit. Water has a materiality that almost consistently eludes capture by knowledge and infrastructure: it has an excess that frequently subverts the way humans attempt to store, direct and use it. Conceived in this way, it shapes history as more than just an environmental factor. In the way it relates to the world around it, we can trace patterns and logics that can be said to be *of it*. Infrastructure, on the other hand, consists of much more than just inanimate things tasked to perform functions in the service of humans. Infrastructures are made of connections between techniques, practices, social values, cultures, economies and politics, and always do more than they were designed to do. What infrastructures actually do, then, becomes a pertinent question. The seemingly technical and administrative level of infrastructure also forms an important level of political engagement between state and society – a level where most people encounter and engage with the state. Together, these material and infrastructural approaches expose layers in the history of Ovamboland that are entangled and intertwined with the social and political. They provide a different sequence of chronologies, breaks and periods that place in question the centrality of those chronologies employed by histories focused on policies and intentions of the state.

## **HISTORIOGRAPHICAL CURRENTS**

Before engaging the specific history of water infrastructure in colonial Ovamboland, I would like to offer a brief historiographical excursus of the

region. In trying to understand how the region, and in particular its water infrastructure, has been variously written about till date, this broad outline of the historiographical landscape will both provide a basic context and help to locate my own approach. This is by no means a complete or comprehensive overview of the historical literature, but instead an attempt at isolating some of its broad patterns.

The earliest published works alluding to a pre-colonial history of this area were early colonial and missionary ethnographic texts. These texts all presented themselves as definitive descriptions and explanations of a savage Ovambo world that was timeless and static. They opened with descriptions of a timeless unchanging natural setting in and by which the Ovambo people lived, and then proceeded to present 'the history' of the Ovambo as a story of origin. In this story they typically referred to a 'native folklore' of origin and attempted to rationally explain it in racist evolutionary and hereditary terms, thus depicting an ancient migration from the Great Lakes region with a gradual differentiation into distinct tribes as a genealogy. In these histories change was only depicted through the succession of Kings. Such histories were first published by Finnish and Rhenish missionaries in the late nineteenth and early twentieth centuries, and then by the colonial official Carl Cocky Hahn in 1928, and the patron of colonial racism Heinrich Vedder in 1934.<sup>2</sup> Subsequent ethnographic publications by Loeb, Estermann and Hiltunen continued in this essentialist tradition, portraying Ovambo people as timeless and backward with their history as a story of hereditary origins,

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<sup>2</sup> Hermann Tonjes, *Ovamboland: Country, People, Mission*, trans. P. Reiner (1911; rep. Windhoek: Namibia Scientific Society, 1996); Carl Hugo Hahn, "The Ovambo" in Carl Hugo Hahn, Hermann Heinrich Vedder and Louis Fourie, *The Native Tribes of South West Africa* (Cape Town: Cape Times, 1928), pp. 1-36.

while replacing the overt racist language characteristic of the earlier texts with more academic language.<sup>3</sup>

The first Finnish missionaries arrived in 1870 in Ondonga, Uukwanyama, Uukwambi and Ongandjera. In 1872, they were expelled from all polities except for Ondonga to which they remained restricted until 1903.<sup>4</sup> From 1891, German Rhenish missionaries began to settle and work amongst the Kwanyama people.<sup>5</sup> Missionaries also established themselves amongst the smaller western polities through the late 1890s and early 1900s, but remained a small presence in these areas compared to the larger eastern polities of Ondonga and Oukwanyama.<sup>6</sup> These missionaries produced a vast amount of literature on the Ovambo people, much of which remain unpublished, acting as ethnographers for a European public back home.

Unfortunately, the rich archive produced by the Finnish missionaries has remained practically inaccessible to most. Much of the material remains in Finland, and the material that has been donated to archives in Namibia are written in Finnish and German. I was able to access some written records and diaries of the Finnish mission ‘father’ Martti Rautanen in the National Archives of Namibia, but they were on microfilm and the gothic font of the old German they were written in was indecipherable and blurred. Most work

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<sup>3</sup> Edwin M. Loeb, *In Feudal Africa* (The Hague: Mouton for Indiana University, 1962). Carlos Estermann, *The Ethnography of Southwestern Angola*, vol. 1: The Non-Bantu Peoples: The Ambo Ethnic Group (New York: Africana Publishers’ Co., 1976). Maija Hiltunen, *Witchcraft and Sorcery in Ovambo* (Helsinki: The Finnish Anthropological Society, 1986).

<sup>4</sup> Harri Siiskonen, *Trade and Socioeconomic Change in Ovamboland, 1850-1906* (Helsinki: Suomen Historiallinen Seura, 1990), 125-126. Kari Miettinen, *On the Way to Whiteness: Christianization, Conflict and Change in Colonial Ovamboland, 1910-1965* (Helsinki: Suomalaisen Kirjallisuuden Seura, 2005), 89.

<sup>5</sup> Martti Eirola, Suppo Rytönen, Harri Siiskonen, and Seppo Sivonen, *Cultural and Social Change in Ovamboland, 1870-1915* (Joensuu: University of Joensuu, 1983), 25.

<sup>6</sup> Meredith McKittrick, *To Dwell Secure: Generation, Christianity and Colonialism in Ovamboland* (Portsmouth, NH: Heinemann, 2002), 160.

based on these archives has therefore been written by Finnish academics.<sup>7</sup> It has led to an enthusiastic and strange Finnish stream of academic writing on Ovamboland that has continued that insular missionary tradition of representing the Ovambo to a mainly Finnish public.

With the nationalist struggle for Namibian independence increasing in intensity and prominence in the 1960s and 1970s, a wave of historians began writing histories that were staunchly anti-colonial and supportive of the nationalist struggle. The earliest of these histories focused on the German colonial period south of Ovamboland, but from the 1970s several texts were published that focused on the historical roots of the migrant labour system in Ovamboland.<sup>8</sup> These drew from the theory of underdevelopment and employed a Marxist analysis, focusing on such concepts of political economy as modes of production, class and capital formation, labour demands, worker exploitation, dependency and underdevelopment.<sup>9</sup> These histories were the first that critically explored the connections between capital, the colonial state,

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<sup>7</sup> See Martti Eirola, *The Ovambofahrt: The Ovamboland Reservation in the Making: Political Responses of the Kingdom of Ondonga to the German Colonial Power 1884-1910* (Rovaniemi: Societas Historica Finlandiae Septentrionalis, 1992); Pellervo Kokkonen, "Religious and Colonial Realities: Cartography of the Finnish Mission in Ovamboland", *History in Africa* 20 (1993), 155-71; Harri Siiskonen, "Deforestation in the Owambo Region, North Namibia, Since the 1850s", *Environment and History*, 2: 3 (1996), 291-308; Harri Siiskonen, "Migration in Ovamboland: The Oshigambo and Elim Parishes 1925-1935", in Patricia Hayes, Jeremy Silvester, Marion Wallace and Wolfram Hartmann (eds), *Namibia under South African Rule: Mobility and Containment 1915-46*, (Oxford: James Currey, 1998), 219-240; Raisa Simola, "Encounter Images in the Meetings between Finland and South West Africa/Namibia", in Mai Palmberg (ed.), *Encounter Images in the Meetings between Africa and Europe* (Uppsala: Nordiska Afrikainstitutet, 2001); Märta Salokoski, *How Kings Are Made – How Kingship Changes: A Study of Rituals and Ritual Changes in Pre-colonial Ovamboland, Namibia* (Helsinki: Helsinki University Press 2006).

<sup>8</sup> Horst Drechsler, *Let Us Die Fighting: The Struggle of the Herero and Nama against German Imperialism, 1884-1915* (Berlin: Akademie-Verlag, 1966).

<sup>9</sup> Richard Moorsom and Gervase Clarence-Smith, "Underdevelopment and Class Formation in Ovamboland, 1845-1915", *The Journal of African History* 16: 3 (1975), 365-81; Renfrew Christie, *The Political Economy of the Kunene River Hydro-Electric Schemes* (Cape Town: University of Cape Town Press, 1975); Robert J. Gordon, "Variations in Migration Rates: The Ovambo Case", *Journal of Southern African Affairs* 3: 3 (1978), 261-94.

indigenous leaders and indigenous labour in Ovamboland. However, in limiting analysis to the level of economic forces and political decision-makers, these histories also reduced the Ovambo people to a largely powerless abstracted mass of labour defined only by their response to the external imposition of European capitalism.

The core narrative and periodisation established by these authors has formed the empirical backbone of the subsequent histories of this period. These works differentiated periods distinguished by economic and political relations between the indigenous people and European capitalism – a periodisation encouraged by the selective focus on such political and economic events in the missionary and colonial archives and separated by the timeframes of those archives. An initial period was distinguished by the introduction of European contact through traders seeking mainly ivory from 1845, followed by a period from the 1880s distinguished by increasing German and Portuguese colonial pressure which led to an increasing demand for cattle, and finally, with the formal colonisation of Ovamboland in 1915, a third period was distinguished by the migrant labour system. Like earlier colonial and missionary texts, these authors set up an initial overview of a static pre-colonial Ovambo world defined by matrilineal inheritance, royal kingship, seasonal agriculture and cattle wealth. This world was depicted as existing in a direct relationship with an unchanging environment. Indeed, their descriptions of this world were based on a largely uncritical reading of those earlier ethnographic texts.

In the 1990s, Harri Siiskonen revisited this pre-colonial world using the rich Finnish missionary archives and represented a more extensive and detailed account of economic and political Ovambo life. His was largely a positivist retelling of the ‘facts’ collected by Finnish missionaries in an attempt to show a more total account along the same periodisation as Moorsom and Clarence-

Smith. Unlike the earlier histories, he however emphasised the agency of the African people in the trade relations with the Europeans. He pointed at a messier world of relations, but it nonetheless remained confined to political events and decisions taken by political elites.

Pre-colonial trade was described by Moorsom and Clarence-Smith as occurring locally between different Ovambo tribes who had access to different natural resources, and over long distances with Okavango people in the east, and Herero people to the south.<sup>10</sup> Long-distance trade took the form of caravans of men organised by the king, who paid the king gifts upon their return. Moorsom and Clarence-Smith not only drew out a synthesised chronology from the colonial, missionary and travellers' documents, they also made the important point that these basic characteristics of pre-colonial trading caravans continued into the migrant labour system.<sup>11</sup> Their work suggests a continuity that cuts through the strictly political and largely Eurocentric periodisation they had initially proposed, and hints at the ways in which colonial rule was embedded in and shaped by earlier configurations.

These historians then described a shift from the precolonial with the arrival of Portuguese traders from the north and Cape traders from the south in the mid-nineteenth century, which led Ovambo Kings to increasingly trade slaves and ivory for horses, alcohol and clothes.<sup>12</sup> Trade with Europeans remained limited in the 1850s and 1860s and Ovambo and Nkhumbi polities possessed few guns. In this period, they were attacked ephemerally by Portuguese colonial forces from the north and Nama forces under Jonker Afrikaaner from

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<sup>10</sup> Moorsom and Clarence-Smith, "Underdevelopment and Class Formation in Ovamboland", 371.

<sup>11</sup> *Ibid*, 379.

<sup>12</sup> *Ibid*, 371.

the south.<sup>13</sup> Early trade with Europeans was however closely controlled and monitored by the Kings and royal officials, who were able to negotiate for increasing numbers guns and ammunition from the 1870s.<sup>14</sup> I find a valuable contribution in Siiskonen's work on this topic as he showed how the particular nature of the relation between water and sand in the area determined where and when people could travel, which allowed Kings to monitor and control the movements of people and trade.<sup>15</sup> He delves further into the question of water to show a seasonally rhythmmed world where rain, dryness and floods animate not only local agricultural and livestock work, or local cultural and social practices, but also the ways external elements acted in the area and interacted with this local world. In so doing he eludes to a logic of a broader materiality of the area shaped by sand and water.

With the large-scale acquisition of guns and ammunition, external and internal cattle and slave raiding became increasingly prevalent from the 1880s and cattle became the central commodity of trade.<sup>16</sup> In the 1890s, the Portuguese and German colonial authorities were increasingly able to restrict the trade of guns and ammunition from the north and south, so raided cattle was increasingly traded for guns to the east through Okavango into Botswana.<sup>17</sup> This period has been described by many authors as a time when Kings and their *omalenge* pillaged their own people and others, when political order descended into chaos and households were left insecure and vulnerable.<sup>18</sup> Due to a devastating rinderpest epidemic in 1897, which is

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<sup>13</sup> *Ibid*, 372.

<sup>14</sup> *Ibid*, 373.

<sup>15</sup> Siiskonen, *Trade and Socioeconomic Change in Ovamboland*, 114-115.

<sup>16</sup> Moorsom and Clarence-Smith, "Underdevelopment and Class Formation in Ovamboland", 373.

<sup>17</sup> *Ibid*, 374. Siiskonen, *Trade and Socioeconomic Change in Ovamboland*, 162.

<sup>18</sup> Patricia Hayes, "The Failure to Realise 'Human Capital': Ovambo Migrant Labour and the Early South African State, 1915-1930", *Collected Seminar Papers*, vol. 19 (London: Institute of Commonwealth Studies, 1992), 55-70; Meredith McKittrick, "Reinventing the Family:

claimed to have killed over 90 percent of the cattle herds in the area, this intense period of cattle raiding and trade stagnation left the Nkhumbi and Ovambo polities severely weakened.<sup>19</sup>

Soon after the rinderpest, in the early 1900s, the Portuguese colonial regime attempted again to conquer the Nkhumbi and Ovambo polities lying in what the Portuguese has declared as their territory. In this period, drought and locusts led to three successive famines in 1904-1905, 1907-1908 and 1908-1909, which left the Ombadja and Oukwanyama further disempowered and vulnerable to Portuguese invasion.<sup>20</sup> Their first military expedition in 1904 was met with crushing defeat by the Ombadja, but in 1905 and 1907, they overpowered the Ombadja and proceeded to establish military forts along the Okavango River.<sup>21</sup> They also fought with Kwanyama forces, but managed to occupy some northern Kwanyama areas like Evale without military conflict, by providing food aid in exchange for their acquiescence.<sup>22</sup>

In Portuguese territory, colonial conquest allowed the government to impose a hut tax in order to force men to work in the colonial economy as migrant labourers. In German South West Africa, after the colonial regime had carried out a genocide against the Nama, Damara and Herero between 1904 and 1907 in response to the Nama and Herero uprisings, the German administration turned to the Ovambo as a labour supply. The Germans demarcated Ovamboland as a reservation in 1906 to isolate it from external trade and then

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Kinship, Marriage, and Famine in Northern Namibia, 1948-1954", *Social Science History*, 21: 3 (1997), 265-95; McKittrick, *To Dwell Secure*, 2002.

<sup>19</sup> Moorsom and Clarence-Smith, "Underdevelopment and Class Formation in Ovamboland", 375.

<sup>20</sup> Emmanuel Kreike, *Re-Creating Eden: Land Use, Environment, and Society in Southern Angola and Northern Namibia* (Portsmouth, NH: Heinemann, 2004), 46.

<sup>21</sup> Moorsom and Clarence-Smith, "Underdevelopment and Class Formation in Ovamboland", 375.

<sup>22</sup> Kreike, *Re-Creating Eden*, 46.

in 1908 during widespread food shortages German officials visited the area to establish 'peace treaties' with the Ovambo Kings.<sup>23</sup> These peace treaties were signed in exchange for food aid, and subsequently ensured a flow of Ovambo labourers south.<sup>24</sup> European missionaries were central mediators in this process and proceeded to act as the recruiters of migrant labourers for the colonial government.<sup>25</sup> Thenceforth male labourers went south in groups on six month contracts to work in the Otavi copper mine, the Luderitz diamond fields and on railway construction, and upon their return were expected to pay gifts to their Kings.<sup>26</sup>

In their analysis, Moorsom and Clarence-Smith provided an oversimplified argument to explain why Ovambo men became migrant labourers. They claimed that because cattle populations had diminished due to the rinderpest, and German and Portuguese colonial regimes increasingly tightened controls and restrictions on the Kwambi and Ovambo polities – local raiding and taxation by the kings 'big men' or *omalenga* intensified in order that those elites could continue trading for valued goods.<sup>27</sup> They hypothesized that this led to a process of 'pauperization' where increasing numbers of men were left without cattle, and that the major response by these men was to become migrant labourers to the colonial economies.<sup>28</sup> Siiskonen argued instead that the main reason that these men became migrant labourers was because their Kings directed them to in order to gain financially themselves.<sup>29</sup> This argument is also overly simplistic and vests far too much power and control in political elites.

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<sup>23</sup> Moorsom and Clarence-Smith, "Underdevelopment and Class Formation in Ovamboland", 378.

<sup>24</sup> *Ibid.*

<sup>25</sup> *Ibid.*

<sup>26</sup> *Ibid*, 379.

<sup>27</sup> *Ibid*, 376.

<sup>28</sup> *Ibid*, 377.

<sup>29</sup> Siiskonen, *Trade and Socioeconomic Change in Ovamboland*, 233.

Meredith McKittrick's work on this period confronts these narrow political and economic explanations by attending to more complexities in early Owambo cultural and social worlds. While these other works were centred on European events and actors, McKittrick emphasised how change was realised throughout Ovamboland with barely any European presence, that it was Owambo people who were central to this change – and not merely as neutral conveyers of Europeanness, but as actors with agency. Holding central the question of security, she explored how the categories and traditions of 'generation' and 'seniority' were effected and reconstructed in this time of turmoil catalysed by the effects of Christianity, cattle-raiding and famine, and how these categories became central to the dynamics of labour migration. She points out that labour migration was overwhelmingly taken up by young men who could achieve seniority only through migrant labour. *Omutenge*, which roughly translates to 'the burden', was a widespread tradition where a young man would be given a cow to start a herd and be eligible for marriage from a senior male figure in exchange for a 'gift', which was increasingly connoted by cash earnings and over time came to require increasing amounts of cash.<sup>30</sup> McKittrick claims that in precolonial times a young man could get a goat or cow by collecting salt from the pans on a six day journey, and then with the introduction of migrant labour before 1918 one 12 to 18 month contract was sufficient to get a cow, but by the 1930s multiple contracts were necessary.<sup>31</sup>

In her work McKittrick melded the missionary archives with oral sources to include the largely neglected western Owambo polities of the Ombalantu, Ongandjera, Uukwaludhi, Uukolonkadhi, Uukwambi and Eunda who had

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<sup>30</sup> McKittrick, *To Dwell Secure*, 181.

<sup>31</sup> *Ibid*, 178-179.

lesser and later involvement with missionaries and minimal contact with colonial officials. She showed that while most Ovambo polities had more centralised kingships, the Mbalantu had collectively murdered their king Kampaku kaHuhua around the beginning of the 19th century and abolished kingship to produce a very decentralised political system.<sup>32</sup> Whereas most histories emphasised the extensive centralised concentration of power vested in Kings and their selected advisers and *omalenga*, McKittrick argued that this centralised power was never stable or complete, and that Kings had to continuously legitimate and reinforce centralised power under changing circumstances.

McKittrick has written extensively about the changing relations with missionaries and colonialists in Ovamboland. Her social history slows down time and closes in on what happened on the ground in a more everyday sense. By doing this she is able to show a complexity and messiness of intentions, desires, and group identities where people are not merely reduced to fit roles in a narrative of resistance, where actions cannot easily or simply be classified and explained. Of most interest to this project, she has applied such an approach to studying water in Ovamboland through colonial mapping, rainmaking and grand colonial schemes to flood the Kalahari.<sup>33</sup> In these works she complicates the distinctions between colonial and indigenous knowledge, exposes some imperialistic roots of the sciences, and challenges distinctions between secular and religious practices. However, the wonderful

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<sup>32</sup> *Ibid*, 26.

<sup>33</sup> Meredith McKittrick, "Making Rain, Making Maps: Competing Geographies of Water and Power in Southwestern Africa", *Journal of African History* 58: 2 (2017), 187-212; Meredith McKittrick, "An Empire of Rivers: The Scheme to Flood the Kalahari, 1919-1945", *Journal of Southern African Studies* 41: 3 (2015), 485-504; Meredith McKittrick, "'The Wealth of These Nations': Rain, Rulers and Religion on the Ovambo Floodplain", in Terje Tvedt, Eva Jacobsson and Terje Oesigard (eds), *A History of Water: The World of Water*, vol. 3 (London: I.B. Tauris, 2006), 449-69.

complexity that she portrays in her work floats somehow detached from the material world. It is a world that exists only as an effect of human thought.

Since the 1990s, a number of historians have turned to oral sources in an effort to recover African-centred pre-colonial histories using a positivist historical approach. This approach tended to reproduce a similar type of history to those of the earlier colonials and missionaries. These histories were limited to representations of the pre-colonial and indigenous through chronologies of successions of political elites in centralised tribally distinct kingdoms that continued to portray Ovambo peoples' beliefs, identities and practices as timeless and essentialised, with change over time depicted only as an effect of political events and conflicts.<sup>34</sup>

Most histories of Ovamboland have differentiated a period of 'colonisation proper' starting in 1915 when the Union of South Africa defeated the Germans in South West Africa and occupied the country and then took over the administration of the country under a mandate of the League of Nations in 1920. The first histories that focused on Ovamboland under South African rule, were only written in the 1990s after Namibia gained independence. In this period a large number of histories was published, including the aforementioned works of the African-centred oral historians, Siiskonen and McKittrick. One group of these histories can be defined as conventional positivist histories that sought to fill in the gaps and correct the facts in a

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<sup>34</sup> Frieda-Nela Williams, *Precolonial Communities of Southwestern Africa: A History of Ovambo Kingdoms 1600-1920* (Windhoek: National Archives of Namibia, 1991); Patricia Hayes, "Order Out of Chaos: Mandume Ya Ndemufayo and Oral History", *Journal of Southern African Studies* 19: 1 (1993), 89-113; Vilho Kaulinge and Patricia Hayes (eds), *"Healing the Land": Kaulinge's History of Kwanyama*, transcribed and translated by Dan Haipinge (Köln: R. Köppe, 1997); Hans Namahuja, *The Ondonga Royal Kings* (Windhoek: Out of Africa, 2002); Lovisa Nampala and Vilho Shigweda, *Aawambo Kingdoms, History and Cultural Changes: Perspectives from Northern Namibia* (Basel: P. Schlettewien, 2006).

rather empiricist approach.<sup>35</sup> They fleshed out the dynamics of South African rule in Ovamboland by uncovering, disputing and focusing on details. They essentially attempted to recalibrate the previous historical cause-and-effect values accorded to specific events. Many of these histories were structured in a narrative of resistance and oppression with a binary of colonial and anti-colonial that culminated in the nationalist struggle for independence.<sup>36</sup> But even where these histories attempted to complicate narratives of resistance and monolithic depictions of the state, they often reproduced them by maintaining a focus on a similar cast of actors in the shape of major political events, individual decision-makers and economic structures within a nationalist framework based on the same state- and Eurocentric periodisation.<sup>37</sup>

From 1915 to 1920 South African rule was defined by martial law. Thereafter many new laws were imported from South Africa including the establishment of native reserves like Ovamboland in 1929.<sup>38</sup> South African officials famously entered Ovamboland without any opposition in 1915 during a devastating famine known as the *Ekuka* – the famine that swept – during which an

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<sup>35</sup> Eirola et. al., *Cultural and Social Change in Ovamboland*; Eirola, *The Ovambofahrt*; Hayes, “The Failure to Realise ‘Human Capital’”; Randolph Vigne, “The Moveable Frontier: The Namibia-Angola Boundary Demarcation, 1926-1928”, in Hayes et. al. (eds), *Namibia under South African Rule*, 289-304; Allan Cooper, “The Institutionalisation of Contract Labour in Namibia”, *The Journal of Southern African Studies*, 25: 1 (1999), 121-38.

<sup>36</sup> Tony Emmett, *Popular Resistance and the Roots of Nationalism in Namibia, 1915-1966* (Basel: P. Schlettwein, 1999); Peter Katjavivi, *A History of Resistance in Namibia* (London: James Currey, 1988).

<sup>37</sup> Siiskonen, *Trade and Socioeconomic Change in Ovamboland*. Wolfram Hartmann, “Ondillimani! Iipumbu ya tshilongo and the Ambiguities of Resistance in Ovambo”, in Hayes et. al. (eds), *Namibia under South African Rule*, 263-88; Jan Bart Gewalt, “Near Death in the Streets of Karibib: Famine, Migrant Labour and the Coming of Ovambo to Central Namibia”, *Journal of African History* 44: 2 (2003), 211-39; Gregor Dobler, “Boundary Drawing and the Notion of Territoriality in Precolonial and Early Colonial Ovamboland”, *Journal of Namibian Studies* 3 (2008), 7-30.

<sup>38</sup> Jeremy Silvester, Marion Wallace and Patricia Hayes, “Trees Never Meet” in Hayes et. al. (eds), *Namibia under South African Rule*, 23. Allan Cooper, *Ovambo Politics in the Twentieth Century* (Lanham, Md.: University Press of America, 2001), 159.

estimated 20,000-30,000 people died.<sup>39</sup> This famine has been described as a key political event that allowed the South Africans to easily negotiate for King Martins acquiescence in exchange for food relief, and also to act as peace broker between King Mandume and the Portuguese in exchange for his cooperation.<sup>40</sup> After years of conflict with Portuguese forces in southern Angola, in 1915 Mandume negotiated with South African officials to allow him and his people to occupy an area just south of the Neutral Zone set up between the Angolan and SWA borders and be protected from Portuguese attack. In 1917 the South African administration turned against him and sent forces to depose and kill him, replacing Kwanyama kingship with a council of Headmen selected by Carl Cocky Hahn and other officials.<sup>41</sup>

Soon after the famine relief provisions were organised, Manning was made the Resident Commissioner stationed at Ondangua and Fairlie was made Government Representative at Namakunde, where they were tasked with processing migrant labourers to Tsumeb.<sup>42</sup> With the officials stationed amongst the Ndonga and Kwanyama respectively, a colonial presence was only established in the eastern areas of Ovamboland, with the west and the numerous smaller polities there largely ignored. In 1920 Manning was made the Chief Native Commissioner in Windhoek and Hahn took his throne as the Native Commissioner of Ovamboland, in which he remained until 1946.<sup>43</sup> Soon after the establishment of the United Nations in 1945, the South African Administration conducted a referendum in SWA, which resulted in an alleged majority of inhabitants voting for SWA to be incorporated into South

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<sup>39</sup> Patricia Hayes, "The 'Famine of the Dams': Gender, Labour & Politics in Colonial Ovamboland 1929-1930", in Hayes et. al. (eds), *Namibia under South African Rule*, 121.

<sup>40</sup> *Ibid*, 122.

<sup>41</sup> Cooper, *Ovambo Politics in the Twentieth Century*, 180.

<sup>42</sup> *Ibid*, 75.

<sup>43</sup> Patricia Hayes, "'Cocky' Hahn and the 'Black Venus': The Making of a Native Commissioner in South West Africa, 1915-1946", *Gender and History*, 8: 3 (1996), 2.

Africa.<sup>44</sup> The majority of these votes were attributed to Ovamboland. This referendum was rejected by the United Nations General Assembly, who recommended that SWA be brought under the UN Trusteeship System, which the South Africa government in turn refused. In 1948, when the National Party came to power in South Africa, they increasingly ignored the UN, treated SWA as a South African province, and began to implement the principles and policies of the apartheid in SWA.<sup>45</sup>

The nationalist historical narrative describes how those political leaders who resisted colonial rule were removed while those who collaborated were empowered, and over time they increasingly became puppets of the colonial masters in an increasingly bureaucratized political system that was increasingly detached from any legitimacy or accountability to the people they ruled over. This process has been referred to as a shift from indirect rule to direct rule. The story also features some different actors, usually male workers, who are depicted as resisting colonialism in a nationalist or proto-nationalist manner. After the implementation of apartheid in SWA, the narrative really becomes centred on the fight against apartheid which took the form of petitioning the UN from the 1940s and then an armed struggle led by SWAPO from 1966, which eventually ended with independence in 1990.<sup>46</sup>

Another movement of historians writing about Namibia in the 1990s attempted to complicate the binary of resistance and oppression by shifting the attention away from conventional political histories based on elites. The

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<sup>44</sup> Marian Wallace, *A History of Namibia: From the Beginning to 1990*, (Oxford: Oxford University Press, 2011), 244.

<sup>45</sup> *Ibid*, 245.

<sup>46</sup> Cf. John Dugard, *The South West Africa/ Namibia Dispute: Documents and Scholarly Writings on the Controversy Between South Africa and the United Nations* (Berkeley: University of California Press, 1973); Roger S. Clark, "The International League for Human Rights and South West Africa 1947-1957: The Human Rights NGO as Catalyst in the International Legal Process", *Human Rights Quarterly*, 3: 4 (1981), 101-36.

aim of these histories was partially historical representation of neglected people, but more to show the social construction of identities, unpack multiple modes of historical experience and imagination, and to deconstruct the colonial archive. An important work in this genre was that of Patricia Hayes, who wrote about the ‘famine of the dams’ as an attempt by the state to consolidate its power in relation to its central concern of migrant labour.<sup>47</sup>

In 1926, the governments of South Africa and Portugal agreed on a new demarcation of the border between SWA and Angola and in 1927 the Neutral Zone was transferred to Angola while in 1928 the border was moved even further south.<sup>48</sup> This resulted in a mass migration of mostly Kwanyama people south into SWA Ovamboland.<sup>49</sup> After prolonged periods of drought, compounded by the disruptions of the border demarcation, famine conditions spread through Ovamboland in 1929 and the colonial administration responded by providing food aid in food-for-work programs centred on the construction of dams. In this ‘famine of the dams’ Hayes showed that local elites and colonial officials together endorsed a division of labour in famine-relief work, where women and men who were deemed too old or young for contract labour were made to work on the construction of dams in exchange for grain. Young able-bodied men were excluded from the projects and expected to continue working as migrant labourers.<sup>50</sup> She argued that these dynamics were an attempt by the state to mime out the gendered divisions of labour that they had been attempting, but failing to instil throughout the 1920s.<sup>51</sup> She proposed that rather than further confining women to the household and cultivation of crops, this work paradoxically encouraged

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<sup>47</sup> Hayes, “The ‘Famine of the Dams’”.

<sup>48</sup> Emmanuel Kreike, “Architects of Nature: Environmental Infrastructure and the Nature-Culture Dichotomy” (PhD Thesis, Wageningen University, 2006), 275.

<sup>49</sup> Silvester et. al., “Tress Never Meet”, 9.

<sup>50</sup> Hayes, “The ‘Famine of the Dams’”, 144.

<sup>51</sup> *Ibid*, 137.

women to leave their households as they increasingly joined Christian missions and urban workplaces outside of Ovamboland in the 1930s.<sup>52</sup> Her work exposes nuances and contradictions in colonial resistance by showing patriarchal continuities between Ovambo elites and colonial officials, but overall remains concerned with a narrative of resistance stuck in a binary of the colonial and the native. In this work infrastructure is only relevant in and as a relation to the more obviously political concerns of gender and labour. The significance of the specificity of the infrastructure is ignored.

Another group of these histories concerns photographs. Colonial officials took numerous photographs of famine-relief work as part of their reports to their superiors. In these photos, women, men and children were shown in long queues for grain rations to symbolise the categorised order and control of the officials. They further represented these people working with emphasis drawn to the gendered division of labour. These photographs form part of a large photographic archive produced by South African officials in Ovamboland, which have been written about quite extensively by Hayes, Hartmann and Silvester.<sup>53</sup> The focus on photographic sources provided a new archival approach which historians interrogated both for empirical details and deconstructed to reveal the colonial archival production and representations of power.<sup>54</sup> These histories commented on how colonials attempted to portray a strictly traditional tribal world devoid of European influence, while exaggerating the extent of colonial control over them. While the photographic archive provided some fresh ideas, they were largely situated back into a political narrative of colonial attempts at domination and

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<sup>52</sup> *Ibid*, 144.

<sup>53</sup> Wolfram Hartmann, Jeremy Silvester and Patricia Hayes (eds), *The Colonising Camera: Photographs in the Making of Namibian History*, (Cape Town: University of Cape Town Press, 1998).

<sup>54</sup> See also Wolfram Hartmann (ed.), *Hues between Black and White: Historical Photography from Colonial Namibia 1860s to 1915* (Windhoek: Out of Africa, 2004).

varied forms of subversion. They were also stuck in a debate at the level of representation, where the more nuanced happenings on the ground then were only deemed relevant in relation to these.

While these social histories accomplished the important task of drawing attention to the operation of power, politics and ideology at the level of the cultural and the epistemological imagination, they also abstracted this world from the things and materiality in relation to which they manifested and without which they could not exist. To varying degrees then they also continued to employ a similar set of actors and stages as the more positivist histories. In these histories, infrastructure and the environment were typically depicted as useful resources or as an unchanging stage for the play of human history. Similarly, non-human actors like cattle and crops, were treated merely as instruments of human actions or as cultural symbols. An approach to environmental history carried by Emmanuel Kreike confronted these issues by attempting to foreground the environment and portray the environment and people as mutually constitutive.<sup>55</sup>

The biggest achievement of Kreike's work was simply paying attention to these oft-ignored aspects of the world in colonial history. By foregrounding the environment and infrastructure he showed a different tempo of history and a different scene of human actions. His work importantly highlighted some connections between water, infrastructure, culture, nature, environment

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<sup>55</sup> Emmanuel Kreike, *Vanishing Floods. People, Land and Water Resources in Ovamboland, 1890-1990* (Pretoria: South African Historical Society Conference, 1997); Emmanuel Kreike, *Re-creating Eden: Land Use, Environment, and Society in Southern Angola and Northern Namibia* (Portsmouth: Heinemann, 2004); Kreike, "Architects of Nature"; Emmanuel Kreike, "De-Globalisation and Deforestation in Colonial Africa: Closed Markets, the Cattle Complex, and Environmental Change in North-Central Namibia, 1890-1990", *Journal of Southern African Studies*, 35: 1 (2009), 81-98; Emmanuel Kreike, *Environmental Infrastructure in African History: Examining the Myth of Natural Resource Management in Namibia* (Cambridge: Cambridge University Press, 2013).

and science in Ovamboland to show moments of human and non-human networks.<sup>56</sup> He argued against a representation of the relationship between people and the environment as an outcome in terms of improvement or decline and instead proposed a focus on processes at multiple levels. I find his descriptions and details of infrastructure, techniques and expertise of great value, which make an important yet unstated argument in their own way. I however find many problems in his attempts to make them speak according to his own argument and analysis.

Kreike's approach sought to complicate the dichotomy of nature and culture, and represent a socio-environmental world in a people-centred approach by emphasising the environment as a human construct. In his work, however, he paradoxically represented the environment and people as distinct entities locked in a simplistic mechanical relationship of cause and effect. This paradox is exacerbated by his uncritical and ahistorical use of concepts such as environmental degradation, overgrazing and deforestation.<sup>57</sup> He argued against the use of absolute benchmarks to measure environmental change, proposing instead incremental markers, but this still employed reductionist categories in an attempt to empirically calculate a more accurate and absolute reality. In his pursuit for empirical accuracy he reads the colonial archive for 'data' as a neutral representation of a 'state of reality', tempered only by a shallow attempt to recognise 'bias'. In varying degrees, his work has therefore reproduced colonial representations and concerns and framed the world according to a narrative and periodisation sanctified by the colonial archive. His work has remained centred on an overarching and simplistic narrative of colonial resistance preoccupied with causal political events, where technology and infrastructure remain constrained to and defined by political

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<sup>56</sup> Kreike, *Re-creating Eden*; Kreike, *Architects of Nature*.

<sup>57</sup> Kreike, *Architects of Nature*, 21.

temporalities. In this narrative, their functions are reduced to productivity in the service of peoples' intentions and their relevance remains isolated to political events outside of them. This methodological problem is of course not exclusive to Kreike; a whole gamut of social and environmental histories continues to suffer from it.

### NEW INFRASTRUCTURAL HISTORIES

Through this brief and quick overview of some key historiographical landmarks, I have attempted to draw attention to some specific conceptual problems in the broader historiography. One is the question of periodisation and chronology. All of these histories seem to have accepted the unquestionable primacy of a political chronology over all other possible chronologies. By concentrating on a similar set of actors and actions there is an inevitability to reproducing this chronology. If we open up and level out the question of agency a bit more, we are able to tell new stories that take on very different chronologies. In terms of agency I mean what makes things change and what is actually happening. I propose that it is much more useful, interesting and honest to think of agency in terms of effect rather than the tired and inflated terms of intention. In terms of effects the cast of actors, or actants, that do things is opened beyond the human. To elaborate more on this question of agency, or actancy, I turn to the school of Actor Network Theory (ANT), and its most vocal proponent, Bruno Latour.

Latour has developed a conceptual framework that attempts to complicate the received notion of agency by looking at both humans and non-humans as *actants* that perform functions. Latour argues that, rather than explaining actions simply as a result of intentions, "[r]esponsibility for action must be

shared among the various actants.”<sup>58</sup> These actants can be any variety of things such as ideas, objects or institutions, and come together in different moments to form hybrids with reconstituted functions. In these terms, agency is more usefully considered as actancy. Following a broadly similar line of argument, Timothy Mitchell elaborates that accordingly “human agency appears less as a calculating intelligence directing social outcomes and more as the product of a series of alliances in which the human element is never wholly in control.”<sup>59</sup>

Indeed, Mitchell’s own work on materiality and infrastructure, that has both drawn from and inspired several conjunctions of infrastructural studies and science and technology studies, remains an object lesson for addressing the complexities of different sociotechnical configurations.<sup>60</sup> I have been encouraged by his recognition of infrastructural embeddedness to consider how multiple, even contradictory, elements from different historical moments remain active in every single or dominant infrastructural regime.<sup>61</sup> New infrastructure must necessarily be built on prior configurations – it must necessarily engage with what already exists, by adopting and adapting the technical, epistemological and material elements of the older infrastructural regimes. It is for this reason that the solidity and efficiency of all working infrastructures are also deeply fragile and historically contingent. As extended material assemblages which generate extra-infrastructural effects

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<sup>58</sup> Bruno Latour, “On Technical Mediation: Philosophy, Sociology, Genealogy”, *Common Knowledge* 3: 2 (1994), 34.

<sup>59</sup> Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (California: University of California Press, 2002), 10.

<sup>60</sup> Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (London: Verso, 2013); Timothy Mitchell, *Rule of Experts: Egypt, Techno-Politics, Modernity* (California: University of California Press, 2002); Timothy Mitchell, “Introduction: Life of Infrastructure”, *Comparative Studies of South Asia, Africa and the Middle East*, Vol. 34, No. 3 (2004). See also Trevor Pinch and Richard Swedberg (eds), *Living in a Material World: Economic Sociology Meets Science and Technology Studies* (Massachusetts: MIT Press, 2008).

<sup>61</sup> Mitchell, “Introduction: Life of Infrastructure”, 438.

and relations, infrastructures are characterised by “their simultaneous internal multiplicity and their connective capacities outwards.”<sup>62</sup>

Ronen Shamir conveys this entangled multiplicity of infrastructure succinctly in his work on electric grid infrastructure in Palestine. He explains that beyond the technical and the material, many other types of connection, such as administrative, legal, political, cultural, imperial, and financial, are involved in the process of bringing about electric lighting. Most importantly, he notes that “such categorical designations are only shorthand. None of these types and sets of connections are independent of any other. Each connection type invokes a former one or, at times, a new one, sometimes of an entirely different order.”<sup>63</sup>

This idea of infrastructural and material embeddedness evokes a layered understanding of history. I propose that these layers should be considered as a palimpsest where different infrastructural regimes constitute a mark on a layer, where the mark on one layer necessarily produces an imprint on the layer below, and at the same time leaves a trace on the layer above. A consequence of this palimpsest is that the distinctness between political periods becomes blurred. Just as the historical moment always exceeds an explanation in terms of simple human intention, these material regimes produce chronologies that disrupt and fissure the neat political chronologies. Therefore, major political events may not necessarily constitute a shift or a rupture in histories of infrastructure, although the two chronologies never stop interacting.

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<sup>62</sup> Penny Harvey, Casper Bruun Jansen and Atsuro Morita, “Introduction: Infrastructural Complications”, in Penny Harvey, Casper Bruun Jansen and Atsuro Morita (eds), *Infrastructures and Social Complexity: A Companion* (London: Routledge, 2017), 5.

<sup>63</sup> Ronen Shamir, *Current Flow: The Electrification of Palestine* (California: Stanford University Press, 2013), 2.

The embeddedness of infrastructure also confronts a second conceptual problem discerned in the historiography – the persistent binary of the colonizer and the native, and the related binary of domination and resistance. The palimpsestic nature of infrastructure represents a much messier and murkier world. This happens because, at one level, the new is necessarily entangled in the old, and in order to be effective must necessarily mobilize and plug into the old. Old techniques, knowledges and practices which have been routinely represented as distinctly native, irrational, unusable, and even primitive, appear instead to be parts of such configurations which are represented as purely colonial, rational, efficient and modern. The binaries are also undermined at another level, when we consider that infrastructure does not merely function according to design, but always exceeds it to produce multiple effects that cannot be neatly contained within the categories of oppression or resistance. Infrastructure does many things, and these things often contradict what it was intended to do so. In this way, infrastructure cannot be understood simply as an instrument of colonial oppression that acts according to some kind of inherent colonial essence to produces a colonial world, or as resiliently resisting colonialism by reproducing a pre-colonial world. What has often been termed colonial and native, or oppression and resistance, reveals itself to be at once much more and much less, and always otherwise.

There has been a significant wave of recent historical work on infrastructure, and a significant pool that has dealt specifically with water infrastructure.<sup>64</sup> I

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<sup>64</sup> Francois Molle, Peter Mollinga, and Philippus Wester, "Hydraulic Bureaucracies and the Hydraulic Mission: Flows of Water, Flows of Power", *Water Alternatives*, 2: 3 (2009), 328-49; Katie Meehan, "Tool-Power: Water Infrastructure as Wellsprings of State Power", *Geoforum*, 57 (2014), 215-24; Matthew Gandy, "Rethinking Urban Metabolism: Water, Space and the Modern City", *City*, 8: 3 (2004), 363-79.

take inspiration from Mitchell's work that considers the role of materiality and infrastructure in the production of a separation between state-society and empirical-theoretical. In his work Mitchell draws out changing patterns of political effect related to particular infrastructural and material regimes. I take guidance from Shamir's application of ANT to studying infrastructure, which emphasized that the ANT method should not simply be used to show that things are made of 'social stuff' with 'social effects', but also to show how the physical connections of infrastructures enable, disable and perform social and political formations.<sup>65</sup>

In the specific context of southern Africa, Antina von Schnitzler's work on prepaid water meter infrastructure provides an accomplished example of how periodisation can be reconsidered through infrastructure and how the seemingly apolitical technical world effects and perpetuates ethical regimes and modes of politics.<sup>66</sup> In Nikhil Anand's work on south Asia, I find an illuminating use of allegory to make connections between the human and non-human. His work looks at the engagement between often ignored networks of people on the ground and technocrats to show how social and technical 'leakages' in urban water infrastructure in Mumbai are necessary to the functioning of these networks.<sup>67</sup> Anand and Von Schnitzler both draw from Partha Chatterjee's Foucauldian argument that the political needs to be interrogated not only in the political sphere, but at the level of the

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<sup>65</sup> Shamir, *Current Flow*, 13; Erik Swyngedouw, "Power, Nature, and the City: The Conquest of Water and the Political Ecology of Urbanization in Guayaquil, Ecuador: 1880-1990", *Environment and Planning*, 29: 2 (1997), 311-32; Erik Swyngedouw, "Dispossessing H2O: The Contested Terrain of Water Privatisation", *Capitalism Nature Socialism*, 16: 1 (2005), 81-98.

<sup>66</sup> Antina von Schnitzler, *Democracy's Infrastructure: Techno-Politics and Protest after Apartheid* (Princeton: Princeton University Press, 2016).

<sup>67</sup> Nikhil Anand, "Pressure: PoliTechnics of Water Supply in Mumbai", *Cultural Anthropology*, 26: 4 (2011), 542-64; Nikhil Anand, "Leaky States: Water Audits, Ignorance, and the Politics of Infrastructure", *Public Culture*, 27: 2 (2015), 305-30; Nikhil Anand, *Hydraulic City: Water and the Infrastructure of Citizenship in Mumbai* (Durham: Duke University Press, 2017).

administrative.<sup>68</sup> I too look to the administrative as a crucial site for exploring where and how politics happens.

This emphasis on entanglement and dispersion is not to say that there are no patterns or logics to this world, or to say that there is no point in speaking of things in terms of intentions. Drawing attention to intention also allows us to undermine the purported distinctness of the colonial state, and to undermine the totality represented by the official state discourse. I take inspiration from the vastly different works of James Scott and Bernard Cohn to identify some of the state's attempts to map broader patterns of legibility and simplification in order to function.<sup>69</sup> However, I draw from Scott cautiously, paying careful attention to Mitchell's emphasis that "the elusiveness of the state-society boundary needs to be taken seriously, not as a problem of conceptual precision but as a clue to the nature of the phenomenon."<sup>70</sup> Part of the phenomenon here Mitchell refers to is the production of a separation and distance between the state and the material reality on the ground, which is at the same time a separation between the conceptual and the empirical. I think that it is possible and valuable to find patterns in the way that the state approaches water conceptually, without recreating a separation between the conceptual and empirical realms and without portraying the state as a distinct and necessarily centralised top-down agent. In fact, precisely in showing the multiplicity and contradictions in the various layers and registers of the state, I hope to undermine its purported coherence, distinctiveness and rationality.

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<sup>68</sup> Von Schnitzler, *Democracy's Infrastructure*, 10; Anand, *Hydraulic City*, 15-16.

<sup>69</sup> James Scott, *Seeing Like a State: How Certain Schemes to Improve the Human Condition have Failed* (New Haven: Yale University Press, 1998); Bernard S. Cohn, *Colonialism and Its Forms of Knowledge: The British in India*, (Princeton: Princeton University Press, 1996).

<sup>70</sup> Timothy Mitchell, "The Limits of the State: Beyond Statist Approaches and Their Critics", *The American Political Science Review*, 85: 1 (1991), 78.

The colonial concern with labour is central to the logic of the state, and it is a concern that has been strangely absent from the work of Latour and ANT. The question of capital, work and labour are deeply linked to the question of infrastructure and materiality, and should be considered central to any study of infrastructure. The abstraction of labour as a homogenous entity has been problematically and uncritically employed by too many explanations. The production of labour as a concept needs to be problematised and historicized, while the specific work that it refers to should similarly be unpacked. In regards to infrastructure the need for this is particularly clear, as the problematic distinction between knowledge and practice is easily recognisable. Here expertise, technique and design cannot be easily separated between a designing mind and a labouring body. Applying an ANT approach to the work of infrastructure should be used to show this diffusion of expertise and undermine these assumed hierarchies of work.

In regards to discerning patterns of change, I also draw inspiration from another school of ideas concerning materiality. Here I look mainly at the work of Jane Bennet, which pays attention to the sediments and residues of the material world that often escapes representation in knowledge.<sup>71</sup> Bennet evokes a heightened sensitivity to the 'emergent properties' of material things, that prompts us to consider a 'nature' of a thing in terms of the way it effects the world. Other scholars like Strang have developed this idea of materiality in relation to water, to consider what we can say about the particular nature of water as it operates in relation to different things.<sup>72</sup> I find

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<sup>71</sup> Jane Bennet, *Vibrant Matter: A Political Ecology of Things* (Durham: Duke University Press, 2010).

<sup>72</sup> Franz Krause and Veronica Strang, "Thinking Relationships Through Water", *Society and Natural Resources*, 29: 6 (2016), 633-8; Karen Bakker, "Water: Political, Biopolitical, Material", *Social Studies of Science*, 42: 4 (2012), 616-23; Jamie Linton and Jessica Budds, "The Hydrosocial Cycle: Defining and Mobilizing a Relational-Dialectical Approach to Water", *Geoforum*, 57 (2014), 170-180.

this approach to materiality has a potential to allude to the interesting patterns of change, particularly in the allegorical connections that traverse material and social realms. I therefore take the language of water seriously in this work, and look to tease out some prescient allegorical connections.

Finally, I try to enact Clifford Geertz's idea of "thick description" in my writing to communicate a sense of these dense, complex connections that often resist being reduced into straightforward categories, closed classifications and monocausal interpretations.<sup>73</sup> Parts of these chapters are saturated with detail, which is not an attempt to portray a more empirically total reality. As best as I can, I have attempted to explain through the immediacies of descriptions, to limit myself only to "short flights of ratiocination" and to abstain from elaborate logical analyses with formal symmetry.<sup>74</sup> I try to heed Geertz's words that, "What generality it contrives to achieve grows out of the delicacy of its distinctions, not the sweep of its abstractions."<sup>75</sup> While the detailed happenings seem to bumble about chaotically in their incessant connections, they reveal, I believe, deeper and older patterns and repetitions that resonate from the particular materiality of sand and water.

## SOURCES AND OVERVIEW OF CHAPTERS

Drawing from a diverse array of histories that have been written about Ovamboland, and from the above-mentioned theories that allow for new conceptualisations of infrastructure and water, while keeping their limits in

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<sup>73</sup> Clifford Geertz, *The Interpretation of Cultures: Selected Essays* (New York: Basic Books, 1973).

<sup>74</sup> *Ibid*, 24.

<sup>75</sup> *Ibid*, 25.

mind particularly in relation to the question of labour – this study seeks to explore how the multiple layers of archive and infrastructure have been coconstituted in Ovamboland in the effort to store, circulate and redirect water and its knowledge, which almost always seems to escape and exceed them.

In this dissertation, I explore the official colonial state archives produced by the South African administration starting in 1915. I am limited to this archive in the first instance because I am only literate in English. The missionary archives and the German colonial archives are written in Finnish and German, respectively, and most of these sources physically remain in Finland and Germany (and even the ones which have been sent to Namibia have not been translated). Written vernacular accounts recorded by missionaries have similarly been left without translation, while other vernacular sources remain without textualisation in traditions of oral history telling. This leaves my work limited to a critical reading against the grain of the colonial archive, in which I pay careful attention to the silences and omissions therein.

My archive also limits me to an initial periodisation that contradicts my explicit efforts to undermine such a politically defined frame. Thus, my story begins in 1915, when the South African officials occupied SWA, entered Ovamboland and began producing this archive. Beyond this departure, however, this work establishes a chronology and periodisation shaped instead by the different layers of water infrastructure. My narrative stops in 1968, when the Water Affairs Branch of the South West African Administration published their grandiose Ovamboland Master Water Plan, which symbolised a culmination of some of the trends traced through the chapters.

Despite the limitations of the archive, I found its multiple registers at different levels to hold rich and interesting possibilities. At one level, we are privy to the grand performance of the colonial state to a global and national audience. At another level, we glimpse the improvisation and agency of officials on the ground. Of particular interest to me are the oft-overlooked technical plans and correspondences between technocratic officials, which provide a valuable insight into the administrative level where efforts to be pragmatic and 'make do' reveal some of the clumsy relations that constitute the state. These so-called technical documents also allowed me to trace out the changing scale and distribution of water infrastructure. I have not so much attempted a comprehensive mapping as I have tried to trace some meaningful trends.

Throughout the process of writing this dissertation, I have struggled to order the material because of the relentlessly entangled, multiple and egalitarian connections that an ANT approach demands. I found that the material consistently resisted confinement to themes and unbroken logical lines, while the necessarily linear nature of writing was at odds with these connections that repeatedly needed to be looped back on themselves. The chapters have therefore been written quite chronologically, which allows these connections to overcome and seep through the strict confines established by thematic sections. The sequence of the chapters also points at a certain layered nature of the infrastructure under scrutiny. The first chapter looks underground at boreholes and wells, the second chapter then moves to the surface level to explore dams and the trust fund system, while the final chapter explores a more built up water infrastructures centred on canals and pump-storage dams constructed in a more top-down approach.

The first chapter shows how the colonial state represented itself and its native subjects as binary opposites to a global audience. It looks at the initial

attempts by colonials to produce a water infrastructure in Ovamboland through borehole technology from 1920 to 1928, which exposes contradictions in the purported binary. It traces multiple assemblages that manifested in these efforts and shows how they were necessarily connected to older social, political, epistemological and technical forms. With the failure of borehole technology, the colonial state attempted to produce a water infrastructure using well technology from 1927, which the second half of the chapter looks at. It explores how deeply embedded this form of infrastructure was in earlier configurations of cattle, agriculture and land. It looks at how this infrastructure produced new political and social identities, traditions and institutions and shows how closely connected colonial and native knowledge, practices and authority were in the production of this infrastructure. It shows in the complexity of these effects that overwhelmingly exceed colonial intention and control.

The second chapter looks the production of dam infrastructure as a form of famine-relief work starting in 1929. It carries on from the first chapter in showing how this infrastructure drew from precolonial designs and knowledge and was deeply embedded in and connected to agriculture, cattle and labour. The production of these dams similarly effected new political and social configurations that exceeded colonial intentions. As a form of famine relief, the production of dam infrastructure established and acted out new relations between money, grain and labour, and the social and political identities they defined. The second part of this chapter looks at the introduction of the Trust Fund System in 1929, which formed a financial infrastructure that connected wells and dams together. It explores how through the Trust Fund System these forms of water infrastructure were embedded in the colonial and 'tribal' economies, where cash and grain

intersected with labour. This section sort of caps off the first two chapters and draws some conceptual and allegorical connections between them.

While the water infrastructure of the first two chapters is characterised by their ad-hoc and make-do nature, the third chapter focuses on forms of water infrastructure where the state took a more centralised and developmental approach from 1947 onwards. It outlines a shift in the discourse, representation and institutions of the state that reflect a developmental leviathan and traces some changes in how the production of certain forms of water infrastructure began to become more centralised. It shows that in these attempts to manage the water infrastructure in a more scientific and technical manner, the infrastructure still necessarily adapted to and adopted earlier knowledge, techniques and practices. The second part of the chapter looks at two forms of infrastructure which effected a significant shift: the large canals and hydro-electric power generation. With the introduction of these infrastructural configurations, the state took on an intense developmentalist approach to the area and attempted to design a total integrated water infrastructure based on these technologies. While these modifications had profound effects, they did not constitute a complete reset of the old ways or heralded the start of a distinct new era, and this section shows how several layers of earlier forms of water infrastructure connected to and shaped the newer ones. It also shows how other layers of infrastructure continued to operate outside of this new layer, while yet others operated in new ways within it.

### **Water from Below:**

### **Boreholes, Wells, and Other Fissures on the Ground**

#### **THE IRRATIONAL OTHER: CURATING NATIVE RAINMAKING**

Finnish, and some Rhenish, missionaries wrote and published extensively on rainmaking practices in Ovamboland. Soon after the first Finnish missionaries arrived in Ovamboland in 1870, the Finnish Missionary Society began publishing written accounts for a Finnish public to stimulate interest and support for the Mission.<sup>1</sup> The early Finnish publications were focused mainly on the larger kingdoms of the Ondonga and Oukwanyama, with a fair amount from Ongandjera and Uukwambi, and very little from Uukwaluudhi, Uukolonkadhi and Ombalantu where missionary presence was limited.<sup>2</sup> A major function of their mission was to produce and present ethnographic material for a European audience that showed the fascinatingly strange and savage otherness of the native heathen. Their accounts of rainmaking thus

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<sup>1</sup> McKittrick, 'The Wealth of These Nations', 5-6.

<sup>2</sup> Salokoski, *How Kings Are Made*, 51.

created such a reality. Early published works by Martti Rautanen, Pietari Kurvinen, August Pettinen, Albin Savola and Kalle Koivu all described Ovambo rainmaking customs and beliefs as explicitly heathen in relation to the Missions theological beliefs.<sup>3</sup> The Rhenish Missionaries had a lesser and later presence, confined to Oukwanyama, and published less ethnographic material on Ovambo customs and beliefs. In 1911 however the Rhenish missionary Herman Tonjes published a major text, which consistently framed indigenous rainmakers as charlatans and rubbished their practices.<sup>4</sup>

Another function of the missionary work was to convince natives in the falsehood of their beliefs and practices, and convince them of the truth of European Christian beliefs and practices. McKittrick has argued that along with printed invectives, the nineteenth-century missionaries also sought to undermine the credibility of indigenous rainmaking practices on the ground, and at times credited their own Christian God with bringing rains.<sup>5</sup>

The colonial interest in indigenous rainmaking practices has a much more limited presence in the official archive. While colonial officials found less use for ethnographic material on rainmaking, their accounts similarly represented the native as a savage other – distant, separate and opposite to themselves. The only archived instance where the colonial state reported on indigenous

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<sup>3</sup> Eirola et. al., “Cultural and Social Change in Ovamboland, 1870-1915”, 12; Salokoski, *How Kings Are Made*, 51. See also Martti Rautanen, *On the Religious Practices of the Ondonga*, (Oulu: Finnish Mission Society, 1904); Pietari Kurvinen, *The First Seven Years as Missionary, or Joys and Sorrows from Africa*, vols. 1-4 (Helsinki: Finnish Mission Society, 1877-80); August Pettinen, “Letters from Africa, i–xix”, *Suomalainen* (1889–1895). Albin Savola, *Descriptions from Ondonga: Booklets of the Heathen Mission* (Helsinki: Finnish Mission Society, 1899); Albin Savola, *In the Huts of Ham* (Lahti: Finnish Mission Society, 1916); Albin Savola, *Owamboland and its People*, (Helsinki: Finnish Mission Society, 1924). Kalle Koivu, *The Daily Bread of the Ovambo Negro* (Rauma: Finnish Missionary Society, 1925).

<sup>4</sup> Tonjes, *Ovamboland*.

<sup>5</sup> McKittrick, “The Wealth of these Nations”, 5-6. Salokoski, *How Kings Are Made*, 54.

rainmaking practices was in 1926, when H. P. Smit, the Secretary for SWA, requested Hahn to provide a report on the tribal customs of the Ovambo for a compilation submitted to the League of Nations in 1928.<sup>6</sup> In the foreword of the compilation the Secretary for SWA noted that its purpose was “to lay before the League of Nations a short sketch of each of the principle tribes, in order that without a great amount of study it can be seen by members of that body the state of development of the natives, their mode of living and the ways in which they resemble and differ from one another”.<sup>7</sup> He claimed that the authors “are all authorities on the tribes they have written about, and I should like to record here the Administration’s great appreciation of their having consented to place their knowledge at its disposal.”<sup>8</sup> Throughout the text and its Foreword, Hahn is presented as the official expert whose knowledge is derived from and validated through his experience of the native world. The veracity of his knowledge is supported by an empirical closeness, and validated by the authority and purported respectability of his position as a state official.

This text acts as a particular representation of ‘the native’ for a global audience. The colonial knowledge of rainmaking is used to evidence their managerial competency and expertise in regards to the nature of their subjects and so further justify their colonial aspirations. The Officer in Charge, Carl ‘Cocky’ Hahn was responsible for the section titled ‘The Ovambo’, the bibliography of which informs us that he relied on his own notes in the field and on a book titled ‘Die Owambo’ by the Rhenish missionary Hermann Tonjes, who worked as a missionary in Oukwanyama from 1898 to 1907 and

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<sup>6</sup> *NAO Monthly and Annual Reports*. NAO [018]11-1v1 (1924-1928). Letter from Secretary for SWA to the Officer in Charge NA, OV on 15 November 1926. Hahn, “The Ovambo”.

<sup>7</sup> Hahn, “The Ovambo”, Foreword.

<sup>8</sup> *Ibid*, Foreword.

wrote extensive ethnographic accounts decrying the heathen practices and beliefs of the Kwanyama.<sup>9</sup> Both the colonial official and missionary shared the ethnographic impulse to study and represent the irrational native other who needed to be civilized by the Enlightened European. The effect is to represent the native and the European as opposites in this sense and to create a distance between them.

Hahn began his chapter thus: “The whole life of the Ovambo is wrapped in a world of magico-religious influences. Not only are there numerous spirits constantly at work for good or evil but also various prohibitions to be observed and endless superstitions to disturb the equanimity of the people.”<sup>10</sup> He proceeded then to give matter-of-fact ethnographic descriptions of various beliefs, ‘prohibitions’ observed and ceremonies practiced, including rain-making practices. The text was presented as an objective description by maintaining a third person perspective throughout, in which Hahn appears as “an omniscient observer, who *sees* society from outside and above, as though at a distance.”<sup>11</sup> In between his ethnographic descriptions, Hahn made sure to emphasise the brutality and cruelty of certain witchcraft practices, which he summed up in his conclusion:

Most of the customs to which reference has been made in this brief report are no longer observed to their full extent among any of the tribes. The more revolting among them, such as those which led to an unnecessary and cruel sacrifice of human life under the tyrannical and despotic rule of chiefs in the past, have fortunately disappeared entirely owing to the gradual enlightenment of the native mind under European influence. The influence of the *onganga* is on the wane and

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<sup>9</sup> *Ibid*, 36. Tonjes, *Ovamboland*, 230.

<sup>10</sup> Hahn, “The Ovambo”, 1.

<sup>11</sup> Steven Feierman, *Peasant Intellectuals: Anthropology and History in Tanzania*, (Madison: Wisconsin University Press, 1990), 27.

the practices which are still indulged in have been divested of most of their objectionable features. Content and happiness are steadily taking the place of the constant fear for life and property under which the people lived until recently under tribal regime.<sup>12</sup>

In describing rain-makers he took a milder tone, portraying them as charlatans rather than cruel evil-doers:

Chiefs invariably have their own *ongangas* and these, as a rule, are doctors from distant tribes. Rain-makers (*alokithi*) are in particularly great demand when the season promises to be bad. The rewards they exact from tribal rulers for their services make their profession a most profitable one. They set about their work in a businesslike manner, generally when the weather looks most promising.<sup>13</sup>

This sentiment that rainmakers waited for rain rather than making it, was shared by Tonjes when describing the sacrificing of black cows in a rainmaking ceremony: "In most cases, the wizards will delay the offering until such a time as the first rain clouds begin to appear on the horizon and they can be fairly sure that there will be rain in the near future."<sup>14</sup> It is interesting how these critiques attempted to undermine the rainmakers' abilities by insinuating the sequence of cause and effect to be wrong, yet in no way explicitly stating that claim. In this way the denial of the validity of indigenous knowledge remains silent in a pact with the reader who is invited to observe the native from a common European epistemological ground with the author.

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<sup>12</sup> Hahn, "The Ovambo", 36.

<sup>13</sup> *Ibid*, 6.

<sup>14</sup> Tonjes, *Ovamboland*, 216.

The colonial state studied and represented native rainmaking practices in order to portray to a global audience the otherness, distance and oppositeness of the native. The Government officials sought to produce a clean division and separation between the peculiar irrationality of the native and the universal scientificity of the State. In this carefully curated representation, they inferred that indigenous knowledge was practically useless to the state. By looking closely at how colonial officials engaged with water infrastructure in Ovamboland, it becomes clear however that their relations to indigenous knowledge and practices were much murkier and much more contaminated. There is another possible reading of the colonial archive that exhibits the actual practices of colonial officials on the ground and produces a different representation of the native and the colonial self. For the period between 1920 and 1928, this archive contains traces of several colonial attempts at understanding the indigenous water infrastructure and incorporating precolonial knowledge and technologies into a European infrastructure based on borehole technology that could be supervised by the colonial state. In this way, the archive is fractured, and to study only the question of representation would reproduce a false distance and oppositional binary between the colonised and coloniser. By placing the question of representation back in the complex context of infrastructure we are able to see a much more complicated and mutually imbricated world. In this way the act of representation can be understood as one part of a much broader network of actants.

Out of practical necessity and limited resources, the colonial state had to 'make do' by engaging, adapting, and adopting indigenous knowledge and practices. The palimpsestic nature of infrastructure necessarily compelled the European colonialists to engage with an established precolonial water infrastructure. This water infrastructure in turn was deeply entangled in networks of relations between various other actants. In relation to

infrastructure, there could be no 'clean break' from what came before; the colonial state could not simply start anew. The actual practices whereby colonials tried to 'fit into' an existing precolonial infrastructure thus undermined the representation of a binary opposition and distance between the native and themselves.

### **BOREHOLES, 1920-8: LOCAL PRACTICE, NATIVE LABOUR**

The first colonial intervention in the regional hydroscape occurred in 1920 when Major Manning requested that boreholes be sunk in response to a severe water shortage in Ovamboland, this was followed in 1921 by the first boring investigation by the Senior Boring Inspector Traas.<sup>15</sup> Boreholes were the first water infrastructure considered by the Administration to improve the water supply in Ovamboland, thought of simplistically as a superior European technology that could 'plug into' sites of established inferior water hole technology. Traas only began actual boring activities in 1927 however, after a second request by the new Officer in Charge Hahn.<sup>16</sup> After another investigation Traas, now the Boring Engineer, Mitchell the Boring foreman and Griffin the Boring Inspector sunk a total of seven successful boreholes, and all but one at Ondangua encountered saline water and were abandoned.<sup>17</sup>

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<sup>15</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter/report from Major Manning, Resident Commissioner, Ovamboland to the Secretary for the Protectorate, Windhoek on 24.08.1920. SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter/report from Senior Boring Inspector Mr Traas to the Secretary for SWA, Windhoek on 07.06.1921.

<sup>16</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Report from Mr Traas, Boring Engineer to the Secretary for SWA on 10.07.1927.

<sup>17</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 40. SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Report from Mr Traas, Boring Engineer to the Secretary for SWA on 10.07.1927. NAO Monthly and Annual Reports. NAO [018]11-1v1, Officer in Charge,

In the early stages of colonial administration in Ovamboland, colonial officials and experts had produced very little knowledge regarding the nature of water and local water infrastructure in Ovamboland. Their first forays were therefore of a reconnaissance nature. In such an unfamiliar hydroscape with no available surface water in the dry season and generally no recognisable forms of water that colonial technology could easily 'plug into', colonials hoped that the invisible world underground would provide a water source that colonial technology could easily tap. They observed that local people constructed wells and waterholes to tap groundwater supplies and were encouraged that they could simply dig deeper holes. Under a perceived emergency that required immediate intervention, borehole technology was the only solution that colonial officials were able to imagine – based on an assumption that superior European technologies could solve the problems that primitive African technologies could not.

Major Manning's initial request for boring in Ovamboland in 1920 came as a response to a perceived severe water shortage. In his description of the severity of the water shortage he identified a central relation between water and labour:

The future position of a considerable portion of the native people living in the neutral zone where there is sufficient water has become uncertain and owing to political discussion connected with the Kunene River above Ovamboland it is now impossible to authorise natives to go there and as they cannot go into Angola even if emigration were desirable from an economic point of view, it becomes urgently necessary for the preservation of our future labour supply as

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OV, Monthly Report for November 1927. SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Griffin, the Boring Inspector, Ondangua to the Boring Engineer, Windhoek on 24.09.1928.

also for the general population of Ovamboland that measures be taken to counteract the present position. ... I would therefore recommend that the question of boring operations being undertaken as early as possible be considered.<sup>18</sup>

The same letter unpacked how water was a concern primarily related to 'native labour' in the early colonial imagination of Major Manning: "As several old water-holes between Ondonga and Namutoni have either dried out or gone brak those routes which are shortest and best for us and Ovambo labourers to Railhead (Tsumeb) now present difficulties."<sup>19</sup> Through the colonial concern with labour and water, Major Manning had to concern himself and the colonial government with the workings of the water infrastructure of Ovamboland. From the outset then, in the simplest sense, water infrastructure formed part of the political workings of Ovamboland in the colonial efforts to establish control over the movements of the population. The introduction of borehole technology occurred in a negotiation with old water-holes, labour routes, the political discussions regarding the neutral zone, and government finances. From the outset, the colonial government proposed that the 'native' inhabitants should at least partially bear the costs of government-constructed water infrastructure: "the considerable sum of money paid into Revenue during the last five years and still being paid in respect of unclaimed wages and untraceable Estates of deceased Ovambo labourers, should be reserved for this and similar purposes connected with the Ovambo labourers and tribes generally."<sup>20</sup>

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<sup>18</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter/report from Major Manning, Resident Commissioner, Ovamboland to the Secretary for the Protectorate, Windhoek on 24.08.1920.

<sup>19</sup> *Ibid.*

<sup>20</sup> *Ibid.*

The inspector's report was the first produced by a colonial 'expert'. It was written as a detailed narrative account of his journey in which he described the changing geology of rock visible on the surface, general nature of the surface of the land, vegetation, surface water conditions and road conditions. The journey was undertaken by motor car with Hahn from Tsumeb in order that the necessary tools could be transported.<sup>21</sup> As the investigation occurred only a few months after a heavy rainy season with much flooding, the car was unable to cross major pans full of water and needed to be pulled through these by donkeys.<sup>22</sup> What the inspector saw was made visible and invisible by the car and its capacity to enter into particular relations with other things. In the first place, the route was determined by where the car was able to travel. Where the sand was too soft and loose, the vegetation too thick, the tree stumps too large, and the flood water too deep – the car could not go. The car also produced in the inspector a heightened sensitivity through its limitations. Thus we see in the report much concern with the condition of the roads in relation to the car, and considerations for future boring activity that should overcome these limitations, such as the availability of donkeys to pull, and the roads being improved.<sup>23</sup> According to the inspector's map, it is clear that the distribution of the 13 proposed boreholes largely followed the path of the inspector's journey by car.

This was also the route that migrant labourers walked to reach the railhead at Tsumeb from Ondangua. Manning's desire for boreholes to facilitate the flow of labour to Tsumeb was echoed by Hahn in a letter following Traas' report,

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<sup>21</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from the Senior Boring Inspector Mr Traas to the Secretary for the Protectorate, Windhoek on 01.09.1920.

<sup>22</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter/report from Senior Boring Inspector Mr Traas to the Secretary for SWA, Windhoek on 07.06.1921.

<sup>23</sup> *Ibid.*

“We must naturally consider the route also (Yanswari) as used by labourers.”<sup>24</sup> The direct relation between roads, boreholes and labour was posited again in Hahn’s following sentence, “For wagons I have always and still favour the long round-about way. If boring is done or undertaken here in earnest then I do not see why we can’t have say two holes on each route, this would greatly facilitate matters all round.”<sup>25</sup> Colonial officials’ initial concerns with water then were around facilitating the flow of labourers south and establishing and strengthening the colonial administrations presence and reach.

#### CHASING WATER THROUGH SAND: THE FIRST WATER REPORT

The first report produced by the boring inspector displayed a heightened sensitivity to the particular nature of sand and water. The inspector reported on the numerous pans, depressions, ‘*Omurambas*’ and water holes around Ovamboland, and noted that the water holes were dug in sandy soil that overlaid a hard crust of ‘*tufa*’ near the surface. According to this understanding of the ground – that the ‘*tufa*’ was exposed near the surface – he explained why water in the water holes turned ‘brack’ after some time<sup>26</sup> He paid close attention to where and when surface water would be available, as borehole drilling would require surface water for the steam-powered drilling machine, workers and animals.<sup>27</sup> Thus he recommended in his conclusion that

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<sup>24</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Lt. Hahn, Ovamboland to Major Manning, Windhoek on 02.06.1921.

<sup>25</sup> *Ibid.*

<sup>26</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter/report from Senior Boring Inspector Mr Traas to the Secretary for SWA, Windhoek on 07.06.1921.

<sup>27</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Senior Boring Inspector, Mr Traas to the Secretary for SWA, Windhoek on 23.07.1921.

boreholes should be sunk as early as possible to use the water available in surface pools from rain.<sup>28</sup> The steam-powered drilling machine could not operate without supplies of surface water available, while the heavy sand and thickly vegetated landscape made transporting the required water over large distances impossible. The nature of the machine thus placed clear parameters as to when, where and how it could be used in Ovamboland and required an understanding of pre-existing water hole infrastructure.

While the inspector paid close attention to sand and water on the surface, he sought valuable information on the underground layers of sand and water. Without any prior boring records he claimed the “question of expressing an opinion of obtaining fresh water by boring is most difficult ... and the whole matter at present is speculative.”<sup>29</sup> Without his own drill, his speculation relied on the test borehole being sunk by the South West Africa Co. using a Diamond Drill at Andoni.<sup>30</sup> Regarding their findings he noted that salt water found at 25ft from the surface had been cased off at a depth of 150ft, and that the “opinion appears to prevail that” fresh water was more likely to be struck be below that depth.<sup>31</sup> If this was the case, he claimed “the difficulty would be solved and the prevailing abnormal conditions experienced during dry periods could be overcome without insuperable difficulties.”<sup>32</sup> Based on this information, the inspector concluded that the position was encouraging since the layer of salt water did not appear to lie too deep, and fresh water was thought to lie below it, which meant the salt water could be cased off. However, this meant that, “boring will be costly since large quantities of

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<sup>28</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter/report from Senior Boring Inspector Mr Traas to the Secretary for SWA, Windhoek on 07.06.1921.

<sup>29</sup> *Ibid.*

<sup>30</sup> *Ibid.*

<sup>31</sup> *Ibid*

<sup>32</sup> *Ibid.*

casing will have to be used, firstly to case off the salt water and secondly to overcome the running sand, thus preventing the borehole from caving in.”<sup>33</sup>

The boring inspector’s initial optimism dissipated when after one and a half month the borehole at Andoni reached a depth of 250ft and still only struck salt water.<sup>34</sup> He expressed concern that it was still unknown how deep fresh water lay and that large quantities of costly casing would be needed if salt water and sandy formation continued too deep.<sup>35</sup> It was estimated that the cost of casing in Ovamboland would be 10/- per foot, and that 400ft would be required per borehole, which meant each borehole would cost £150.<sup>36</sup> Transporting everything needed for boring from Windhoek and Otijivarongo by railway and wagon to the first boring site in Ovamboland was estimated to cost £140 and to take 20 days.<sup>37</sup> The list of objects needed included a drill, a railing machine, extra casing, tools, wagons, a harness, tanks, salaries of foremen, assistant, native labour, and rations.<sup>38</sup> Boring in Ovamboland was definitely a very expensive endeavour, but the boring inspector remained optimistic that sites further north of Etosha Pan would be more favourable, believing that salt water would not reach such great depths.<sup>39</sup>

The inspector’s analysis was by no means limited to a scientific investigation. He had to take into account financial costs of casing due to the nature of the sand, the quality and location of roads in order to transport equipment, and the seasonal location and availability of surface water needed for the steam-

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<sup>33</sup> *Ibid.*

<sup>34</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Senior Boring Inspector, Mr Traal to the Secretary for SWA, Windhoek on 23.07.1921.

<sup>35</sup> *Ibid.*

<sup>36</sup> *Ibid.*

<sup>37</sup> *Ibid.*

<sup>38</sup> *Ibid.*

<sup>39</sup> *Ibid.*

powered drilling machine, workers and animals.<sup>40</sup> His work involved interviewing Chief Martin who “expressed willingness to assist in providing any labour needed”, while Hahn committed to providing animals for transport.<sup>41</sup> The inspection was carried out with a clear awareness of the role of water in the colonial aspirations for Ovamboland:

Ovambo in Angola will immigrate to Ovamboland as soon as permanent water is available, but under present conditions this is impossible as the country is already overpopulated as far as water supplies are concerned. – As a matter of fact with the large influx of returning labourers the position may be most serious this year.<sup>42</sup>

Furthermore, the inspector reported that he was informed by Chief Martin and other headmen that water running into Etosha pan came from Kunene River. These authority figures were in this way incorporated into the production of this report in particular, and the production of knowledge in general, that would inform decisions made by colonial authorities regarding the hydroscape of Ovamboland.

In 1926, Hahn requested that Traas be sent again to carry out an investigation to inspect the areas and different points where water was most needed and to report on boring possibilities, commenting that previously he “had paid a hurried visit” and that “water holes and vleis were still full after a very good rainy season and the country then gave quite a different and wrong

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<sup>40</sup> *Ibid.*

<sup>41</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter/report from Senior Boring Inspector Mr Traas to the Secretary for SWA, Windhoek on 07.06.1921.

<sup>42</sup> *Ibid.*

impression of its very urgent needs."<sup>43</sup> Hahn noted that although the official instruction to him was that "actual boring in the eastern portion of the Okuanyama area ... should not be undertaken until such time after I have found and reported that sufficient water cannot be obtained by ordinary digging", it made sense to him that since boring was already planned for the Ondonga-Tsumeb route and at Ondangua, and that Traas would have to report on the water prospects of those areas before boring machines were dispatched, then he could also report on the eastern areas as part of this trip.<sup>44</sup>

The boring investigation in 1927 required four wagons pulled by 100 donkeys to transport the boring machine, drills and other equipment, which weighed a total of 25 tons.<sup>45</sup> It took nine days to reach Tsumeb by railway. From Tsumeb to Namutoni the road was firm and the trip was easy. However, the 25 mile road from Namutoni to Usohama was "sand, heavy and in thick bush" with no water available, so "the machine and one wagon had to be temporarily abandoned."<sup>46</sup> Upon reaching Usohama, the donkeys needed to recuperate and were unable to pull the machine and wagons across the 46 mile stretch of the Andoni flats. Hahn advised that the donkeys could not do any more pulling in the heavy sandy parts of the road as this would render them "useless for any further work for the remainder of the dry season."<sup>47</sup> He supplied his oxen to fetch the heavy boring machine, but had to avoid the sandy road and the wagons had to be pulled through dense bush during the

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<sup>43</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from C. Hahn Officer in Charge, Native Affairs, Ovamboland to the Secretary for SWA, Windhoek on 14.10.1926.

<sup>44</sup> *Ibid.*

<sup>45</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Hand written report from Mr Traas the Boring Engineer, Ondangua to Secretary for SWA, Windhoek on 07.07.1927.

<sup>46</sup> *Ibid.*

<sup>47</sup> *Ibid.*

day as the “long ‘spans’ got continuously entangled during the dark”.<sup>48</sup> Travelling like this it took five days to cover 33 miles.<sup>49</sup> Once the boring machine reached Ondangua, it had to travel another 54 miles to the first boring site of Hangombe. The road to Hangombe had to be cut open and cleared for the machine and the journey took 7 days.<sup>50</sup>

The first borehole site was selected by Hahn at Hangombe and failed as it hit brack water and caved in without having sufficient casing as only 120 feet of casing could be transported. A second site 9 miles east of Hangombe in a deep pan which contained water was selected. A car would not have managed to negotiate the sand and vegetation, so a horse was hired from an unnamed “native chief”, as well as “native carriers” to transport their food, bedding and supplies, and so the exploration of eastern Ovamboland was carried out on horseback with Eedes.<sup>51</sup> Traas described the area as generally “of a gentle undulating nature, the depressions being formed of harsh alluvium clay pans and the higher portions consisting of sandy soil.”<sup>52</sup> It seems some parts of his report were informed by local informants, as when he wrote about local well infrastructure,

The pans are all of an impervious nature and all hold water, the deeper ones for a considerable period after the rainy season. When water from these pans is exhausted ‘usuance’ is sought from shallow wells which are sunk from 5 to 10 ft deep until a hard bed of impervious clay and lime is reached. ... Water percolates through from

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<sup>48</sup> *Ibid.*

<sup>49</sup> *Ibid.*

<sup>50</sup> *Ibid.*

<sup>51</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Report from Mr Traas, Boring Engineer to the Secretary for SWA on 10.07.1927.

<sup>52</sup> *Ibid.*

the surrounding sandy country and when the well gives in new ones in a fresh locality are dug.<sup>53</sup>

The report gave indications of what surface features and objects Traas prioritised in order to locate underground water and how he categorised the different areas into types. Moving eastward, he noted, “the country assumes a typical Kalahari aspect and the sand becomes very loose and heavy. No anthills are seen and the timber changes to wild yellowwood and the occasional camelthorn and the usual kalahari shrub and bush.”<sup>54</sup> In order to estimate where groundwater lay, he looked for ‘exposed rock’, but found none on the main road from Namutoni to Namukundi and therefore had “very little guidance in regard to location of water.”<sup>55</sup> Furthermore his other local indicators, “Kraal conditions, such as wells and waterholes are of little assistance except that invariably salt water is struck when the hard bed of clay and lime is pierced.”<sup>56</sup> He was clearly uncomfortable and unsatisfied with these indicators, which left him “of the opinion that boring in this area will not be easy and serviceable water will be difficult to find” and so only two boreholes were sunk here. What he really wanted to see was the layers of rock that conformed to his geological understanding of underground water, and maintained that the second hole would provide further information “concerning the strata and conditions regarding water available, a factor of very great importance as a guide.”<sup>57</sup>

Traas’ exploration of the area west of the Ondangua-Namukande road indicated a marked difference to the east, with the west described as being

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<sup>53</sup> *Ibid.*

<sup>54</sup> *Ibid.*

<sup>55</sup> *Ibid.*

<sup>56</sup> *Ibid.*

<sup>57</sup> *Ibid.*

decidedly flatter, consisting of much larger portion of *omuramba*, and getting swampy during the wet season.<sup>58</sup> He commented on the local “intelligent method in water preservation”, whereby

[l]arge holes are excavated between a cluster of ‘Injandi’ or wild fig trees which minimises the drying out and evaporation very considerably. The depth of these holes varies from 6 to 10 ft according to the depth of the impervious lime and clay beds.<sup>59</sup>

He was certain that salt water lay below the impervious bed to unknown depths and therefore claimed it was

most essential that a couple of ‘trial’ holes be sunk in this area to ascertain both the geological and underground water conditions. Sites have not yet been selected as there is very little to choose between one place over another, but I have personally arranged with Mr. Hahn that it should be about 20 to 25-mile East of ‘Omafufu’.<sup>60</sup>

Traas concluded his report on boring possibilities in Ovamboland by recommending that rather than relying on boreholes, “a good deal more should be done to open surface water by using dam scrapers for cleaning out shallow pans and depressions.”<sup>61</sup> He recommended that they should be designed to be protected against cattle and small stock, leaving only sufficient open for drinking purposes, which would “reduce both fouling and reduce evaporation to a minimum. I am inclined to think that this will be a surer way to solve the water problem than by boring.”<sup>62</sup>

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<sup>58</sup> *Ibid.*

<sup>59</sup> *Ibid.*

<sup>60</sup> *Ibid.*

<sup>61</sup> *Ibid.*

<sup>62</sup> *Ibid.*

In early 1928, the Boring Inspector Griffin went to Hangombe to continue drilling with foreman Mitchell and reported the results to Traas. A third borehole was drilled to a depth of 230 feet but it collapsed and had to be abandoned, with the casing recovered in day.<sup>63</sup> The boring inspect Traas noted that

[t]here does not appear to be much choice of boring sites in this area as there are no antheaps of strata and the whole country appears to be uniform and the three boreholes drilled had the same strata up to depths drilled i.e. 170 ft, 250ft and 230 ft respectively.<sup>64</sup>

A fourth borehole was sunk to 352 ft and water was extracted and given to Head Office to test – it was salty.<sup>65</sup> As a borehole was sunk deeper, narrower casing had to be used. Concrete casing was expensive and costly to transport so when it was buried and lost it was a significant loss to the administration. When the fourth borehole reached a depth of 420 f. it started caving in faster than it could be cleaned out.<sup>66</sup> The difficulties with casing were explained by Traas in this manner:

Should casing be driven to any depth the question of getting same out again, in the event of no fresh water being struck, is a very doubtful one and in any case the getting out of casing, inserted to any great depth in the area being drilled, would be a very slow process as the casing would have to be jacked out with the help of plant, as the plant cannot pull 200 ft. of casing inserted in the strata being drilled,

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<sup>63</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Traas, Boring Engineer, Windhoek to the Secretary for SWA, Windhoek on 15.03.1928.

<sup>64</sup> *Ibid.*

<sup>65</sup> *Ibid.*

<sup>66</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Sgd. Mitchell, Engombe to Officer in Charge, Native Affairs, Ondangua on 23.03.1928.

without the help of jacks, owing to strata packing round same after insertion.<sup>67</sup>

Like Traas's earlier exploration with drilling machinery, this early drilling expedition struggled to find sufficient water to drill. At one point they abandoned the drill as they had run out of water.<sup>68</sup> With the vast quantities of concrete casing needed to drill in the soft sand, large teams of donkeys were needed to transport it, and to transport water and other supplies to the site. The drilling team had 20 donkeys and noted that in future many more would be needed.<sup>69</sup> They warned however that the main problem would remain: that there is not enough water to supply the donkeys, themselves and the machines.<sup>70</sup> Griffin sunk two boreholes at Ondangua in central Ovamboland a few months later. The first borehole struck salt water at 90 feet, while the second one struck fairly fresh water at 50 feet. Water samples were taken from both to be tested.<sup>71</sup> The shallow borehole of 50 feet constituted the only success in this phase of boring, and by 1934 it was only producing muddy water before it became unusable due to heavy rainfall that year.<sup>72</sup>

The failure of the attempted boreholes and the conclusions of Traas's report led to what the Administrator referred to in 1927 as a "consensus of opinion that Ovamboland on account of its soil and the layout of the country is an

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<sup>67</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Traas, Boring Engineer, Windhoek to the Secretary for SWA, Windhoek on 15.03.1928.

<sup>68</sup> *Ibid.*

<sup>69</sup> *Ibid.*

<sup>70</sup> *Ibid.*

<sup>71</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Griffin, the Boring Inspector, Ondangua to the Boring Engineer, Windhoek on 24.09.1928.

<sup>72</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from the Native Commissioner, Ovamboland, Ondangua to The Secretary for SWA, Windhoek on 27.03.1934.

ideal place for the conservation of water by means of ordinary storage dams.”<sup>73</sup> This was followed by a bold statement in the 1929 Annual Report by Hahn, “Boring machines have failed in this country and so the Administration inaugurated a scheme of dam building.”<sup>74</sup>

The attempts to construct boreholes in Ovamboland relied heavily on local waterhole and well infrastructure as sources of knowledge and water. In their investigations into boring, the state carefully studied this local water infrastructure and technology, mapping out the hydroscape in relation to it. Unlike their studies of rainmaking, which were presented to distance, other and denounce indigenous knowledges and practices, these studies surreptitiously closed that distance and attempted to adopt, adapt and fit into it. On the ground the colonial engagement with water infrastructure was forced to confront its deep entanglements with the particular materiality of the sand, seasonal rainfall and agriculture, established travel and labour routes, and cattle.

### **A MINISTRY OF MAGIC: EMPLOYING WATER DIVINERS**

Between 1929 and 1961, the SWA administration received no fewer than 19 applications from water diviners offering their services to the state.<sup>75</sup> The government’s engagement with water diviners corresponds neatly with the failure of their boring efforts in Ovamboland, and can in this way be seen as

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<sup>73</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Administrator, Windhoek to Hahn, Native Affairs, Ondangua on 07.09.1927.

<sup>74</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report 1929.

<sup>75</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Report by Wipplinger, Director of Water Affairs SWA for the Administrator in Executive Committee on 02.12.1961.

another desperate attempt to 'make do'. While the state presented itself as an autonomous, rational and confident custodian of progress, the administrators' actual efforts to produce a successful water infrastructure with limited resources and capacities undermined these claims.

In the archive of state officials' correspondence with water diviners, the voice of the state is thus necessarily fractured. The internal communications between technocratic state officials often dismissed the water diviners as conmen and charlatans. Yet in official responses, they were treated with perfunctory, formal respect and politely given excuses for their rejection. Most of the time, it was uncertainty that dominated the language and tone of communication amongst officials, punctuated by silences that hang suspended between the pull of practical and rational principles, surrounded by an air of suspicion and taboo. This ambiguity is reflective of the broader status and disavowal of the internal other, of European non-rationality, within the colonial state. It points to an epistemological inconsistency within the statist discourse and also indicates continuity in the fractured nature of the official archive.

The earliest of these applications in 1929 claimed to be responding to the governments search for water diviners,

I hear from the foreman Vukish, that the irrigation department seeks men who are able to show the water with a magic wand. I can do it very good and I wish to have a position as such a man. Would you be so kind as to give me some details about this matter.<sup>76</sup>

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<sup>76</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Letter from S. Khun, Neuhof-Kowes, Post Dordabis to Irrigation Department Windhoek on 14.10.1929.

The Director of Works' response leaves it unclear as to whether they were indeed seeking to employ a water diviner, simply and politely informing the applicant that "it is regretted but we are unable to offer you a position as a water diviner."<sup>77</sup>

In 1930 the Department of Works decided to give an opportunity to one such water diviner, a Mr Coetzee from Johannesburg, to prove himself. The archived correspondence does not explicitly discuss the water diviners' methodology nor the officials' opinions of them, we are merely told that

"[i]t is the Director's wish that as far as possible Mr. Coetzee should be tested, and I desire that you should give him every facility to prove himself. ... Please try some of your worst farms if this is possible."<sup>78</sup>

In this instance, the water diviner was to be supervised and reported on by a technical official from the Department of Works.<sup>79</sup> The diviner was to provide written evidence of his estimates of the depths that water would be struck by and the quantity of water they would provide at each site, which then required the signatures of Coetzee, the official and other witnesses.<sup>80</sup> The archive contains no information on the diviner's results, but it shows that applications from water diviners soon after Coetzee were met with the

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<sup>77</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Letter from Director of Works, Windhoek to Mr. S. Kuhn, Neuhof-Kowes, Post Dordabis on 22.10.1929.

<sup>78</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Letter to Clausen from (Signature) Traas, stamped with 'Department of Works, 10.07.1930.

<sup>79</sup> *Ibid.*

<sup>80</sup> *Ibid.*

response that “the degree of success from experiments does not justify the employment of any water diviners by this department”.<sup>81</sup>

Water divining applicants employed different rhetorical strategies to appeal to state officials. Some claimed prior experience in North America, Canada, Europe, South Africa and SWA – attempting to validate the practice through other modern Western states.<sup>82</sup> Some echoed the popular ‘vein’ explanation for the art, claiming that they were able to locate subterranean water veins.<sup>83</sup> Most of them, however, employed the hegemonic language of scientific rationality in reference to probability. In an appeal to science, they used different terms, sometimes evoking the precision of percentages, and at other times tying tight knots using conflicting terms of calculability. As one applicant wrote, “I am in a position to indicate with certainty water veins which would warrant the sinking of a borehole so that any degree of failure would more or less be eliminated. Boring would therefore, become a more reasonable proposition.”<sup>84</sup> The rationalistic language and appeals to scientific discourse were likely not only a literary device to convince – by “putting a rational shell around an ‘irrational’ kernel ... to elevate dowsing to rational and scientific status” – but also perhaps, as Krautwurst has argued, “it may be more a case of State (or totalizing) science trying to incorporate a ‘nomad science’”.<sup>85</sup>

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<sup>81</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Letter to Prof. Dr. Knothe, Government Building, Windhoek from the Director of Works, Windhoek on 28.07.1930.

<sup>82</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Letter to the Boring Commission, Windhoek from Mr D. Hutsmann, Farm Otjikoto S., Omaruru dated 1930.

<sup>83</sup> *Ibid.*

<sup>84</sup> *Ibid.*

<sup>85</sup> Udo Krautwurst, “Water-Witching Modernist Epistemologies and Dowsing Rationality: Exporting Models of Non-Rationality through Colonial and Development Discourses”, *Political and Legal Anthropology Review* 21: 2 (1998), 75-6.

In 1930, SWA officials corresponded with the Resident Commissioner in Bechuanaland to evaluate the claims of the water diviner Dannert who offered his services to both colonial governments. In these communications the Director of Works SWA made sure to express his scepticism, noting that “Numerous Diviners have in the past claimed to possess exceptional powers for locating underground water. On being tested the results have almost without exception proved unsuccessful.”<sup>86</sup> He however also admitted that

Reports are current that Mr. Dunnert’s site selection has proved exceptionally successful but no authentic or reliable information is available. Herr Dunnert’s work in connection with locating underground water is being carefully followed and any information obtained will if so desired be gladly furnished.<sup>87</sup>

The Director of Works noted that by this time the administration had been ‘conned’ several times and had grown very sceptical about undertaking further experiments with water diviners. As with previous water diviners, signed reports of the boreholes sunk at sites selected by Dannert using his divining rod were provided by official boring inspectors.<sup>88</sup> The following year Dannert offered his services to the Bechuanaland administration, claiming that he had been employed by the SWA Administration and had found successful boreholes in 20 out of 46 cases.<sup>89</sup> The Director of Works denied that

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<sup>86</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Letter to the Resident Commissioner, Mafeking, Bechuanaland from the Director of Works on 07.11.1930.

<sup>87</sup> *Ibid.*

<sup>88</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Letter to Clausen, Clark, Heard and Griffin from the Boring Engineer, Windhoek on 17.04.1931.

<sup>89</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Letter to Resident Commissioner, Mafeking, Bechuanaland from the Director of Works, Windhoek on 02.05.1931.

they ever had employed him, clarifying again that “our experience of water diviners is of such a nature that the expense is neither warranted nor justified.”<sup>90</sup> The SWA administration further explained that they had by this time employed a geologist who was sent along to collect data in connection with water divining efforts.<sup>91</sup>

As with indigenous rainmaking, here in an official presentation the colonial state opposes itself to and distances itself from an irrational other by denouncing it. This official denunciation came from the same official, the Director of Works, that ‘wished’ to test a water diviner that same year. Despite their official claims, in 1931, the Department of Works tested another four water diviners and reported that the boreholes sunk on sites selected by them had mostly failed to find water. In 1933, they rejected an offer, claiming that they couldn’t use the applicant’s services at the time. Then, in 1935, they rejected another approach by a water diviner, claiming they could not employ him as they were currently carrying out virtually no boring.<sup>92</sup> Despite a succession of failed efforts by water diviners, and their dismissal in official correspondence, in their responses to water divining applications, state officials did not completely dismiss the validity of water divining knowledge.

Despite the fact that these water diviners were tested on private farms south of Ovamboland, they engaged with the same state department that orchestrated boring in Ovamboland, and had they successfully proven themselves would no doubt have been employed there. The state’s efforts to test water diviners should be seen as another attempt to ‘make do’ by

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<sup>90</sup> *Ibid.*

<sup>91</sup> *Ibid.*

<sup>92</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Report by Wipplinger, Director of Water Affairs SWA for the Administrator in Executive Committee on 02.12.1961.

employing and adopting practices and forms of knowledge that the state officially denounced as other. In this case, the binary opposition between the scientific state and magical other is here undermined. This is the side of the archive that is hidden beneath the state's performance and representation of itself.

### **'ORDINARY DIGGING': WELLS AND WATERHOLES IN THE EAST, 1927-43**

Well-digging in eastern Ovamboland was initiated by colonial officials in response to concerns with the overpopulation of the Oukwanyama people who were migrating to the SWA side of the border from Angola. Initially the officials attempted to sink boreholes in the east to supply water, but with the failure of boreholes from 1927, they relied entirely on well and waterhole infrastructure. Well-digging activities in the east drew on the knowledge produced by the reconnaissance carried out earlier by colonial boring inspectors, but was shaped more by the colonial authorities' lack of knowledge and expertise. Well-digging expeditions were an instance where colonial authorities were forced to rely on local expertise and practices to 'solve the water problem'. In the early stages of well-digging, the administrations resources were spread thinly and consequently pragmatic concerns like the lack of economic backing, lack of official personnel and lack of adequate machinery inhibited the colonial administration from applying their own 'modern' infrastructures in eastern Ovamboland.

The colonial discourse around well-digging played on and informed stereotypes of 'backward savages' and 'progressive natives'. Local elites who were unwilling or unable to make sufficient efforts at well-digging in eastern Ovamboland were considered 'old savage types' – a category which

encompassed a vast range of 'attitudes' at odds with colonial officials' desires and intentions. Furthermore, the Kwanyama were considered 'progressive natives' to be promoted and favoured by the colonial regime over other 'more backwards' tribes. These colonial stereotypes of natives drew from and fed into broader discourses of development and progress.

The well-digging expeditions into eastern Ovamboland also created communities with new stratified relations to the state and to other communities. These communities were in greater contact with colonial officials than others, and were able to make greater claims on funds and tools from the colonial administration. People migrating south from Angola were resettled under new local authorities whose power was established through their capacity to 'open water' through well-digging. These local authorities received applications from potential settlers, and had the capacity to decide who could settle where and when. Communities were established where water supplies allowed, but these water supplies were still dependent on local rainfall, and in times of local drought people had to rely on social networks as water had to be fetched from Angola and other nearby settled areas, or people had to resettle until water supplies refilled.

The ownership of the land and water infrastructure being 'opened up' in eastern Ovamboland specifically for Oukwanyama settlement, was disputed by Ondonga Headmen and their king Martin. In 1929 during famine conditions colonial officials claimed that they had negotiated with the king for this land in exchange for food relief. Eventually the land in the east became Oukwanyama land, and the well-digging expansion led to a clear inter-tribal border being decided and cut. During these negotiations the colonial state also introduced a Tribal Trust Fund, which was financed through household taxes, and was in turn used to finance well-digging activities.

In the digging of wells and water holes in eastern Ovamboland, the colonial officials acted from a distance, taking on a sporadic supervisory role, or sometimes merely authorising particular local elites to initiate expeditions, or sometimes playing no role other than reporter. Local elites on the other hand acted as more than just intermediaries; orchestrating events and making decisions to realise their own intentions, which were often also confluent with those of colonial officials – the most pertinent and obvious being the pressing need for water. These ‘water-opening’ expeditions were intimately connected to the tribal council system that was implemented in the Oukwanyama polity after the colonial regime deposed King Mandume. The colonial officials had the authority to select the headmen that constituted the council, and well-digging work provided a new route to possible selection.

The well-digging expeditions were also shaped in many ways by the environment of eastern Ovamboland. The timing, location and duration of the well-digging expeditions were reliant on the availability of surface water accumulated from local rainfall. Well-digging could only be carried out a certain distance from of the natural pans and ‘bushmen water holes’ that held rainwater. The introduction of a donkey-drawn cart with pneumatic tyres extended this distance, but with no drastic changes to the nature of well-digging expeditions, they maintained these limitations.

Wells remained the core water infrastructure in the east until 1947 when the administration established a vague policy regarding water in Ovamboland wherein supplying water in the eastern area became a more central concern

associated with development.<sup>93</sup> Wells and waterholes were ignored in the later investigations, reports and discussions that informed this new policy, which evidenced a new separation between water infrastructures that were the concern of state experts and those that were the concern of local officials on the ground. After 1947 the Works Department and later the Water Affairs Department carried out several phases of borehole drilling and constructed large excavation dams in the east. Despite these endeavours, well-digging expeditions orchestrated by local authorities continued to provide a separate and supplementary supply of water.

#### **'OVERPOPULATION' AND CATTLE: COLONIAL CONCERNS**

One of the most popular topics amongst the colonial officials in my archive is the 'expansion' of the Oukwanyama into the eastern parts of Ovamboland. Starting in 1925, the colonial officials reported major concerns about the overpopulation of the Oukwanyamas in north-central Ovamboland due to migration from Portuguese territory into South West Africa Ovamboland.<sup>94</sup> The colonial administration was determined to permanently resettle these migrants on their side of the border as they regarded them an invaluable 'asset'. After South African forces killed the Oukwanyama King Mandume in 1917, they replaced the institution of kingship with a council system composed of headmen who were former rivals of Mandume and were more willing to cooperate with the colonial regime.<sup>95</sup> Another valuable factor for the colonial administration was that the Oukwanyama had the largest population

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<sup>93</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from the Secretary to the Administrator-In-Advisory Council on 17.12.1947

<sup>94</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v1, Officer in Charge, OV, Annual Report for 1925.

<sup>95</sup> Kreike, *Re-Creating Eden*, 69.

of the Ovambo polities, which the colonial administration regarded as an invaluable source of exploitable labour.

There were two major waves of migration from the northern floodplain in Angola across the border into South West Africa Ovamboland. The first exodus was in 1915, as a result of the combination of a succession of droughts and famines from 1904 and the escalating warfare between the Oukwanyamas under the rule of King Mandume and Portuguese armed forces from 1911.<sup>96</sup> After more than a decade of fighting between the Portuguese forces and the southern polities of the Cuvelai floodplain, mainly the larger polities of Ombadja and Oukwanyama, the southern polities were left devastated and fled south. The South African colonial administration intervened in the fighting in 1915 and promised King Mandume refuge south of the Neutral Zone, which is where the majority of the Oukwanyama population then resettled. Over the next decade the Oukwanyama also settled in the Neutral Zone itself.

The second wave of large scale migration of Oukwanyamas to the middle floodplain area south of the new border occurred from 1926 to 1928.<sup>97</sup> In 1927, the SWA-Angola boundary was demarcated 7 miles south of the southern Neutral Zone boundary by a joint Portuguese-South African surveying team, and in September 1928 the area north of the demarcation, including the Neutral Zone, became part of Angola.<sup>98</sup> By this time many Kwanyama people were settled in this area and therefore moved southwards to the SWA side of the new border. The colonial administration first considered boring as a means to 'open water' in the eastern area of Ovamboland in order to settle the

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<sup>96</sup> *Ibid*, 46.

<sup>97</sup> Kreike, "Architects of Nature", 76.

<sup>98</sup> Kreike, *Re-Creating Eden*, 61. Jeremy Silvester et. al., "Trees Never Meet", 9.

flood of immigrants, but the high cost and risk associated with boring turned them to a scheme of 'ordinary digging' in 1926:

the actual boring in the eastern portion of the Okuanyama area, where it has been planned to settle the Ovakuanyamas, because of the present tribal area becoming very much overcrowded, should not be undertaken until such time after I have found and reported that sufficient water cannot be obtained by ordinary digging and which operations were to commence as soon as sufficient rains have fallen to provide water for the many natives who will thus be employed.<sup>99</sup>

After the subsequent failures of boring attempts in 1927 and 1928, 'ordinary digging' to obtain water became the standard water infrastructure of eastern Ovamboland.

Colonial concerns with overpopulation were deeply embedded in the world of cattle. Indeed, Hahn's 1925 annual report that made the first mention of plans to extend the settlement of Oukwanyama into eastern Ovamboland connected overpopulation to cattle and water: "Natives are migrating to Ovakuanyama area from Angola with stock. This area is becoming very overcrowded and it will be necessary to open water in the eastern uninhabited area to settle further refugees."<sup>100</sup> Like other communities in the floodplain, Oukwanyama cattle were kept near their owners' kraals during the wet season when water and grazing were available, and during the dry season they would be sent to distant cattle posts. At the time when colonials raised concerns with overpopulation, most Oukwanyama cattle were taken seasonally to cattle posts in the Shimpolo Veld on the Portuguese side of the

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<sup>99</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from C. Hahn Officer in Charge, Native Affairs, Ovamboland to the Secretary for SWA, Windhoek on 14.10.1926.

<sup>100</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v1, Officer in Charge, OV, Annual Report for 1925.

border in the dry season. Until 1937, only cattle belonging to the eastern settler communities were discussed by officials, and they were usually only referred to implicitly as part of the water needs of those communities. In 1937 however Portuguese authorities warned that cattle from SWA found grazing in Angola would be seized, and so the need to find grazing and water for these cattle in eastern Ovamboland became a major and urgent concern for the colonial administration.<sup>101</sup> This concern reached the upper echelons of government, and in 1941 the Chief Native Commissioner expressed it thus:

The undesirability of stock from this territory being moved seasonally and sometimes more or less permanently North of the border is realised by the Administration. In fact, it is a state of affairs which is admitted by us to be intolerable and which cannot be permitted to continue indefinitely. It is thus imperative that the Administration should do everything possible to make provision for all SWA Ukuanyama stock to be depastured and watered in this territory and with that end in view it has already been engaged on a scheme of gradually opening up the Eastern Ukuanyama by the provision of new water supplies.<sup>102</sup>

The administration's explorations for cattle posts pushed much further east and south than explorations for human settlement sites, and consequently led to territorial conflicts that resulted in the further expansion of Oukwanyama territory. In 1940 the first major exploration for potential cattle posts was undertaken and ten wells were attempted that were classified as permanent water sources specifically for cattle.<sup>103</sup> The 1940 exploring party found several

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<sup>101</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v10, Acting Native Commissioner Trollope, OV, Ondangua, Monthly Report for August 1937.

<sup>102</sup> NAO [010]5-7-1, Letter from the Chief Native Commissioner, Windhoek to the Assistant Native Commissioner, Runtu on 21.06.1941.

<sup>103</sup> NAO [010]5-7-1, Report from Assistant Native Commissioner, Oshikango to Native Commissioner, Ondangua on 10.07.1942.

places further south-east with *vleys* and small waterholes dug by the so-called “Bushmen”, which were considered ideal for cattle posts.<sup>104</sup> Parties also dug waterholes themselves, and cleaned and enlarged “Bushmen” waterholes.<sup>105</sup> The “Bushmen” were not considered to have any claim to these lands, but were employed as informants and guides, providing information about the location of water and the lay of the land. The colonial officials saw these people as useful for having developed many successful waterholes in the area, which they equated with natural *vleys*. In these ways they were regarded by colonial officials as part of nature. In these expeditions, the “Bushmen” were counted by officials and their distribution was officially recorded, but their presence did not matter in the plans of occupying these lands.

The colonial administration was explicit that they were willing to displace the people living on the land demarcated for Oukwanyama settlement and cattle posts. In 1941, the Chief Native Commissioner said:

Judging by results to date, however, that scheme cannot be more than partially successful and must be supplemented by other means if the object aimed at is to be achieved. It appears that this supplementary relief can take only one form – the adding of the un-allocated area between Ovamboland and the Okavango Native Territory to the Ukuanyama Area; the gradual settling of Ukuanyamas with their stock along the Okavango, North of Kuring Kuru and the removal of any Okavango Natives residing along that section of the River to the South of Kuring Kuru. The Administration is assured that this

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<sup>104</sup> NAO [010]5-7-1, Report by Assistant Native Commissioner, Oshikango on 30.07.1940.

<sup>105</sup> NAO [010]5-7-1, Report by Assistant Native Commissioner, Oshikango to Native Commissioner, Ondangua on 06.09.1941.

arrangement would probably provide a complete solution of the whole problem.<sup>106</sup>

The search for cattle posts continued in the following year, and in 1942, the administration felt confident they had found sufficient suitable sites in the Ombongolo Muramba to accommodate the Oukwanyama stock that seasonally moved to the Shimpolo Veld and other parts of Angola for grazing, and deemed it necessary to extend the Oukwanyama border south-eastwards into Okavango areas to include the Ombongolo Muramba.<sup>107</sup> The emerging pattern of expansion into the east was described by officials in 1946, "With the increase in population, the people are always pushing farther towards hitherto unoccupied bush country where perhaps earlier the people had their cattle posts only. The cattle posts have then, in turn, to be shifted farther away."<sup>108</sup> The construction of water infrastructure in the east was in these ways intimately tied to, and in fact constructed through, concerns with cattle, land and labour.

## TERRITORIALITY AND TRIBAL BORDERS

The eastern area was variably referred to by colonial officials as 'waterless', 'bush', 'uninhabited', 'unpopulated' and 'useless to both men and stock', despite the fact that Bushmen people lived there, and that Ondonga headmen

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<sup>106</sup> NAO [010] 5-7-1, Letter from the Chief Native Commissioner, Windhoek to the Assistant Native Commissioner, Runtu on 21.06.1941

<sup>107</sup> NAO [010] 5-7-1, Letter from the Assistant Native Commissioner, Oshikango to Native Commissioner, Ondangua on 06.03.1941. NAO [010]5-7-1, Report from Assistant Native Commissioner, Oshikango to Native Commissioner, Ondangua on 10.07.1942.

<sup>108</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v19, Native Commissioner, Ondangua Annual Report for 1947.

and their chief Martin considered it part of their territory. Before the colonial administration planned to appropriate and displace the Kavango people in the far east, disputes over land in the east had first arisen with the Ondonga headmen and their chief Martin. Thus, we see a report from November 1928 stating that

Aufiku has dug six wells and found plentiful supply of water which the Ondonga headmen are coveting. If Martin refuses to give this part of the country, the whole policy of the Administration, in enticing natives to extend eastward and to move from Angola will be defeated.<sup>109</sup>

The Native Commissioner Hahn had been negotiating with the Ondonga Chief Martin for the land since April 1928, and in 1929 officials claimed they had reached an agreement that the Oukwanyama could settle the land in exchange for food relief during the famine.<sup>110</sup> Disputes with Ondonga headmen over waterholes and the boundaries of the claimed territory continued up to 1938 when reports stated that the dispute was settled amicably and Chief Martin waived all claims to the disputed territory. The following year however reports stated that

This necessitated the holding of several inter-tribal meetings between representatives of the Ondonga and Ukuanyama tribes. ... It was only after firm handling of the matter that Chief Martin ultimately agreed to wave all claims to the area under dispute.<sup>111</sup>

Thus, we see the colonial officials on the ground discussing a 'firm handling' which is reported to the upper echelons as having been 'settled amicably'.

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<sup>109</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Letter from Eedes, Oshikango to Hahn, Ondangua 16 November 1928.

<sup>110</sup> Hayes, "The 'Famine of the Dams'", 128. NAO [010]5-7-1, Letter from the Native Commissioner, Ondangua to the Secretary for SWA, Windhoek on 10.10.1939.

<sup>111</sup> *Ibid.*

Official reports claimed that the dispute nearly halted all work in 1938 and that

the Ondonga natives were the cause of endless delays and troubles even after their Chief had given instructions to assist in the work of demarcating the new tribal border, but this is quite usual when the Ondonga tribe is concerned in any work of this sort.<sup>112</sup>

Unlike the territorial disputes with the Ondonga headmen, the disputes over land settled and used by Okavango people did not arise from activities on the ground, but were premeditated, discussed and resolved in colonial official reports and letters. In 1941 we see the planning of this potential territorial dispute,

The portion known as the Reserved Area which has been occupied by Okavango Natives remains earmarked for Ukuanyamas. But must wait for Ukuanyama cattle to be inoculated first. The area which shall be open to occupation by the Ukuanyamas shall be all that west of a straight line running from the furthest point which stock can reach when grazing if watered in the Ombongola Omuramba. ... The ultimate aim being that by a very gradual process they, as Ukuanyamas, shall infiltrate into the rest of the Okavango Territory and bring a good influence to bear on the more backward Okavango Natives. ... The Native Commissioner of Ovamboland will start the investigations as soon as possible. He will first go through to the Okavango River so as to pick up Okavango Natives to show him the country.<sup>113</sup>

After finding the Ombongola Omuramba settled by a certain Tom Kenyata and his followers and around 1,400 head of cattle belonging to Shivute,

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<sup>112</sup> *Ibid.*

<sup>113</sup> NAO [010] 5-7-1, Statement by Chief Native Commissioner, Senior Veterinary Surgeon, Native Commissioner Ovamboland and Assistant Native Commissioner Ovamboland, undated (1941 est.).

colonial officials planned to remove these inhabitants and replace them with 8-10,000 Oukwanyama cattle.<sup>114</sup> The scheme was however thwarted on ‘Veterinary grounds’ as the Okavango was considered a ‘clean’ area without lungsickness, which the Oukwanyama cattle risked compromising and so the search for cattle posts continued together with the seasonal flows of cattle across the border.<sup>115</sup>

The discourse around the conflicts between different tribes used stereotypes that fed into a larger discourse of development and progress. While the Ondonga were described as jealous, scheming and rancorous, and Okavango people were described as backwards, more hope was placed on “the progressive and orderly Ukuanyama tribe.”<sup>116</sup> The Oukwanyama people were described as agents of progress and development that would spread their influence and change through the other tribes. Their preferential treatment by officials was loosely justified by this rhetoric, and in this way these stereotypes can be seen to have informed the water infrastructure in eastern Ovamboland.

## **DIGGING WELLS AND CLIMBING LADDERS: ELITE FORMATION**

The archive is relatively quiet about the earliest endeavours to ‘open water’ in the east by ‘ordinary digging’. This is likely because these earliest efforts were

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<sup>114</sup> NAO [010] 5-7-1, Report by Assistant Native Commissioner, Oshikango to NC, Ondangua on 06.09.1941.

<sup>115</sup> NAO [010] 5-7-1, Report from Assistant Native Commissioner, Oshikango to Native Commissioner, Ondangua on 10.07.1942.

<sup>116</sup> NAO [010] 5-7-1, Letter from the Native Commissioner, Ondangua to the Secretary for SWA, Windhoek on 10.10.1939.

left to Paulus Aufiku Hamtenya and his cousin Elia without colonial officials' participation on the ground. From a report in 1936 we are however told that

In 1927 Subheadman Paulus (Haufiku) Hamtenya, who was living at Edundja, was sent by the Ukuanyama office to try and find water in the Eastern Ukuanyama. He in turn sent his cousin Elia to investigate and report. Elia dug a waterhole at Enana and established a kraal. Paulus followed and Elia moved to Ondanda where he proceeded to do the same. During the next few years Ohaihana and Onakalunga were established.<sup>117</sup>

This brief description tells us that the role of the colonial officials in this early work was limited to 'sending' a particular 'Subheadman'. The tone of this language is however deceptive. A more accurate understanding of this 'sending' is hinted at in a 1928 report when Hahn refers to the administration's policy as "enticing natives to extend eastward and to move from Angola".<sup>118</sup> In this type of 'sending' that was also 'enticing', intention and agency were more dispersed. Paulus Hamtenya and his cousin Elia had a lot to gain as the administration offered these well-digging pioneers' political authority, land, access to valuable tools and the ability to provide cash wages, food and tobacco to workers.

Some of these gains were noted in 1932 when upon his death Paulus Aufiku was given something of an obituary in the annual report, which stated that "many wells were sunk by him in places suitable for settlement and to date a considerable number of kraals have been established and large tracts of

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<sup>117</sup> NAO [010] 5-7-1, Letter from the Officer in Charge, Oshikango to the Native Commissioner, Ondangua on 22.08.1936.

<sup>118</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Letter from Eedes, Oshikango to Hahn, Ondangua 16 November 1928.

country added to his tribal area.”<sup>119</sup> The report further explained that when at the outset “plans for expansion were explained to the natives”, Aufiku showed keen interest and ability and did his utmost to extend the tribal area eastwards with the aid of the tools supplied to him by the Administration.<sup>120</sup> It is important to consider more closely the practice whereby ‘plans for expansion were explained to the natives’ at meetings. ‘Meetings’ to explain or discuss water infrastructure projects such as well-digging were one of the few ways that Ovambo people interacted with the colonial state ‘in person’. These meetings were one of the ways that well-digging came to occupy the interstice between the colonial state and colonised peoples. In these meetings the terms of headman authority were contested and relations with the colonial state were established.

Elia, the cousin earlier ‘sent’ by Paulus Hamtenya, was made a Principal Headman in 1934 after complaining that the previous Principal Headman Hamkoto Kaluvi had been “placing obstacles in the way of further development”.<sup>121</sup> The process of this replacement was described thus: “The matter was discussed with the Council of Headmen with the result that it was decided to create Elia a principal headman in charge of the new country opened up by Paulus Hamtenya since 1927.”<sup>122</sup> In the colonial rhetoric there is a tension in the obscure movement from ‘discussed’ to ‘decided’, culminating in the intentionality of an ambiguous but unanimous ‘it’. This tension is indicative that the decision was not solely the Headmen’s to make, neither was it simply the colonial official’s, but rather an assemblage of actants that in

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<sup>119</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v5, Native Commissioner, OV Annual Report 1932.

<sup>120</sup> *Ibid.*

<sup>121</sup> NAO [010] 5-7-1, Letter from the Officer in Charge, Oshikango to the Native Commissioner, Ondangua on 22.08.1936.

<sup>122</sup> *Ibid.*

their totality formed the 'it'. Impeding the development of water infrastructure led to Hamkoto Kaluvi losing his Headman status, while succeeding in opening up water through well-digging was determinant of Elia becoming Headman.

Other headmen were described by officials as responding unenthusiastically to Elia's calls for them to send him people that he would in turn show where to dig for water, due to their "jealousy of Helia's rapidly growing power in the East."<sup>123</sup> Elia appears to have become increasingly influential throughout the eastern well-digging expansion. In 1934 colonial officials noted that he had "permanently settled over two hundred people" and that he was receiving "more applications for land from the Angola side than he can deal with."<sup>124</sup> He was one of the colonial officials' foremost authorities on well-digging in eastern Ovamboland and nearly all the well-digging expeditions were orchestrated with or by him. Official reports praised him for being "an energetic and enterprising native", and claimed that the success of well-sinking along the border was "a real credit to [him] and his followers".<sup>125</sup>

Upon his visit to Ovamboland in 1936, the Administrator for SWA gave a ceremonial speech to the Oukwanyama where thousands of people were in attendance. In his speech, he said:

I am glad to hear from Wehulu (Mr Thompson) that you are opening up wells in the East. That is a good thing. You must have more room for the children to come and for the cattle. I have told Shongolo (Major

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<sup>123</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v7, Native Commissioner, OV, Ondangua, monthly report for September 1934.

<sup>124</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v7, Native Commissioner, OV, Ondangua, Annual report for 1934. NAO Monthly and Annual Reports. NAO [018] 11-1v7, Native Commissioner, OV, Ondangua, monthly report for October 1934.

<sup>125</sup> *Ibid.*

Hahn) that the natives who do the work and find water must have the best places.<sup>126</sup>

The Administrator proceeded to single out Elia in his speech: “Headman Elia, I hear you have been working very well on this job. That is good. You people and you are going on the right path.”<sup>127</sup> Throughout his speech, he made generous reference to the idea of progress:

Mr Clarke reported to me you were going forward. This is right. All nations and peoples either GO UP or GO DOWN. They never STAND STILL. You are going forward because you pay attention to Wehulu and Shongolo. They are your friends and they will help you.<sup>128</sup>

The state here clearly represented itself as a paternal figure of progress patiently prodding its children.

The production of this particular type of water infrastructure in eastern Ovamboland was thus embedded in the process of constituting and defining the Oukwanyama ‘tribal council’, a governmental system imposed by colonial authorities that garnered a degree of legitimacy through maintaining certain political structures and empowering pre-existing authority figures, which was continually negotiated from above and below. These negotiations did not merely consist of the colonised bargaining against the terms proposed by the colonial, but also involved the colonial meeting terms proposed by the colonised. The terms of negotiation in turn were informed by the particular nature of the infrastructural project at hand. The nature of the hydroscape in the east meant that well-digging expeditions could only be undertaken during a limited period when surface water was available after local rains had fallen.

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<sup>126</sup> NAO [010] 5-7-1, Speech by the Administrator to the Oukwanyama Where Thousands Attended 01.06.1936.

<sup>127</sup> *Ibid.*

<sup>128</sup> *Ibid.*

Due to this reliance on rain, the timing of these expeditions often clashed with the agricultural demands. It fell upon the local well-digging leaders to manage this conflict of interests. More often than not, the terms for negotiating what a headman's role was, how someone could become a headman and what their relationship to the colonial administration was, were operationalised by these 'on the ground' considerations related to well-digging.

### TECHNOLOGIES OF SETTLEMENTS AND RECRUITMENT

The areas that the well-digging pioneers opened up to settlement in eastern Ovamboland were made part of their domains of rule. The people who settled, and the land they settled on, all fell under the jurisdiction of Headman Haufiku and later his cousin Elia.<sup>129</sup> The archive indicates that potential migrants from Angola made applications directly to these Headmen, who then decided which applications to accept or reject. A colonial report from 1936 stated:

Ukuanyama natives, as well as those of other tribes, living in Angola are watching developments very closely and our headmen are receiving frequent applications for places in which to settle. Just recently a minor chief of Omashaka came over with quite a large following – about 70 kraals – to settle on our side of the line. It is of course not our policy to encourage migration from Angola but the fact remains that they come over to us whether they are wanted or not.<sup>130</sup>

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<sup>129</sup> NAO [010] 5-7-1, Letter from the Officer in Charge, Oshikango to the Native Commissioner, Ondangua on 22.08.1936.

<sup>130</sup> *Ibid.*

The officials claimed they had a policy regarding settlement that was shared by the Portuguese officials, which was to “allow the natives to sort themselves out as they please.”<sup>131</sup> While colonial officials may not have interfered directly in deciding who would be settled in eastern areas, they attempted to keep track of how many people were being settled and specifically noted when they were wealthy or powerful people.

The establishment and construction of settlements in the east reinforced the authority of headmen not only through the expansion of their domain of rule and the number of subjects under their authority, but also through performance of authority. Omboloka was considered a key position to the official plans for the eastern settlement scheme. The inauguration of the settlement there in 1937 was therefore “made a tribal enterprise” where the “headmen were called together, plans drawn up and as a result no fewer than 1500 natives proceeded to Omboloka” and “took part in the clearing of bush for the establishment of the first kraals and fields.”<sup>132</sup> Such performances were not simply produced as ‘tribal enterprises’ for the natives, but included the colonial state. For instance, the speech by the Administrator in the previous year was a ritualistic performance of a ‘tribal’ tradition that involved colonial officials and portrayed coloniser and colonised as part of the same world.

The archive provides little information regarding the number of people that settled in the east or how many people the wells were able to provide for. We are however told in a report from 1934 that Helia “has struck a plentiful supply of sweet water at this place. This means that two or three new kraals

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<sup>131</sup> *Ibid.*

<sup>132</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v10, Native Commissioner, OV, Ondangua, Annual Report for 1937.

will be established there this year.”<sup>133</sup> Being dependent on their wells, which in turn were dependent on local rain, these settlements were particularly vulnerable to water shortages. In years when sufficient rains failed to fill their wells, the inhabitants had to transport water from settlement north in Angola. Those in the far east, and those further south of the Angola, were forced to relocate to Angola until sufficient rain fell.<sup>134</sup>

The earliest efforts at well-digging in eastern Ovamboland were under the leadership of Headman Haufiku and his cousin Elia with little official presence on the ground. They appear responsible for recruiting the groups of workers that ventured east to open water, referred to in reports as their “followers”.<sup>135</sup> The monthly report for September in 1934 claimed that Headman Elia had asked other Headmen to send him workers so that he could show them the places to dig for water, and that they “did not seem very keen”.<sup>136</sup> In the early period, Haufiku and Elia seemingly received little support in recruiting workers from other Oukwanyama headmen or from colonial officials, but in 1936 the colonial officials expressly stated that all the other headmen sent workers to assist and this trend continued in the following years.<sup>137</sup> The rhetoric of ‘sending’ workers was recurrent, but unfortunately the archive provides no hints as to what it meant for headmen to ‘send’ workers. The 1936 report also emphasised that the additional workers supplied to Elia allowed him to commence several wells

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<sup>133</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v7, Native Commissioner, OV, Ondangua, Monthly Report for September 1934.

<sup>134</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge Oshikango, NA, OV. Monthly Report to Ondangua, December 1929.

<sup>135</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v11, Native Commissioner, OV, Ondangua, Monthly Report for July and August 1938.

<sup>136</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v7, Native Commissioner, OV, Ondangua, Monthly Report for September 1934.

<sup>137</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v9, Native Commissioner, OV, Ondangua, Annual Report for 1936.

simultaneously, which seems to indicate that previously he and his group were only able to sink one well at a time.<sup>138</sup> Up to 1936, through the opening up of waterholes and wells, kraals were established eastwards at Enana, Ondanda, Ohaihana, Onakalunga, Oheti, Epinga, Ehonge, Omalapapa, Oidimba, Epasha, Oshipala-sha-Muongo, and Huanga Munene.<sup>139</sup> The Officer in Charge at Oshikango provided the following hand-drawn map [Image 1] to indicate where settlements had been established up to 1936:

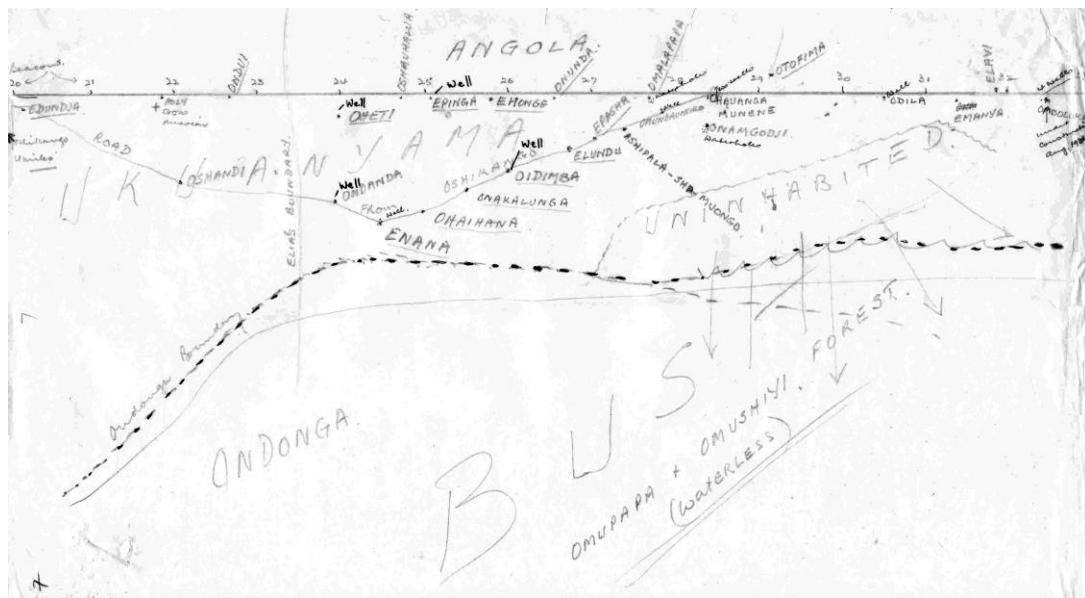


Image 1<sup>140</sup>

As more and more headmen started sending workers to assist Elia, the scale of well-sinking in the east expanded from 1936. Elia remained largely in charge of well-digging affairs and instigated projects independently of officials, which is reflected in the 1936 comments by the Oshikango Officer in Charge like “Elia has started four wells simultaneously at different spots on the Omboloka flat and he is very sanguine of success” and “Elia experimented

<sup>138</sup> *Ibid.*

<sup>139</sup> *Ibid.*

<sup>140</sup> *Ibid.*

by digging a large open hole in a sand dune."<sup>141</sup> A letter from the Ondangua Native Commissioner's office to the Officer in Charge at Oshikango titled 'Opening up of wells beyond Omboloka by Elia', sheds more light on the chain of command:

Mr. Hahn has been very busy of late ... He however made a brief endorsement on the above-mentioned minute, that Elia can get on with the job as soon as possible. He would like you to await his arrival at Oshikango, before visiting the places where the new wells are to be opened, as there are some matters he would like to discuss with you in connection with these areas.<sup>142</sup>

In this letter, interestingly, colonial officials and well-diggers are portrayed as colleagues.

The first indication of direct involvement of colonial officials on the ground in the opening up of water for settlement was in May 1932 when the Native Commissioner rather boldly claimed he had selected sites for the sinking of wells, then arranged and supervised their sinking.<sup>143</sup> In this same expedition one well-digging work party was supervised by a "Government Messenger", and we are told that extensive well-digging operations were "in hand in all parts of the area", which implies that there were numerous others supervising other well-digging operations.<sup>144</sup> There is no indication of how many workers were involved, where they came from or who they were. In fact, the sparse descriptions of this expedition and earlier expeditions are profoundly effective in suppressing the number of workers engaged, their recruitment

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<sup>141</sup> NAO [010] 5-7-1, Letter from the Officer in Charge, Oshikango to the Native Commissioner, Ondangua on 22.08.1936.

<sup>142</sup> NAO [010] 5-7-1, Letter from Native Commissioner, Ondangua to the Officer in Charge, Oshikango on 28.04.1938.

<sup>143</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v5, Native Commissioner, NA OV, Ondangua Report for May 1932.

<sup>144</sup> *Ibid.*

details and the degree of official involvement in all the various stages of the expeditions. It is clear however that this more official expedition did not replace the more independent efforts made by Elia, who continued to sink wells and supply colonial authorities with reports on them.<sup>145</sup> This official vagueness is telling of the uncertain boundaries and hierarchies that this work precipitated. Looking at the subsequent reports of well-sinking expeditions 'led' by colonial officials, it becomes clear that these large-scale surges were very dependent on the expertise and experience of local well-diggers in matters of selecting sites, arranging workers and supervising. It would appear that colonial officials sometimes inflated their own agency in these matters, but I think this is a further indication of the ambiguity of authority and agency in the process of opening water in the east, and of the confusion that occurred when this needed to be neatly presented to higher colonial authorities in reports and letters.

### **DIGGING THE WELLS: SUPERVISION, 'SPECIALISED' WORK AND 'FAIR' PAY**

The first detailed account of the structures and dynamics of well-digging work appears in a letter from 1938 when a systematic sinking of wells was proposed by the Officer in Charge, which had been "fully discussed with the Headmen and Sub-Headmen" who the Officer in Charge at Oshikango claimed were "all in agreement with the above suggestion and prepared to give the following scheme, if approved by the Administration, their full support".<sup>146</sup> It was proposed that 10 to 20 men with "good practical knowledge of well-sinking and timbering be employed by the Council as

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<sup>145</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v7, Native Commissioner, OV, Ondangua, Monthly Report for September 1934.

<sup>146</sup> NAO [010] 5-7-1, Letter from Officer in Charge, Oshikango to the Native Commissioner, Ondangua on 31.12.1938.

overseers and paid by the Tribal Trust Fund at the rate of 30/- per month."<sup>147</sup> While previous expeditions were unpaid, payment was now deemed necessary as the sinking of wells was considered "specialised and often dangerous work" that needed "some responsible person in charge who has the required knowledge and will be answerable for the daily supervision."<sup>148</sup>

These supervisors were each to be in charge of a gang of six to eight voluntary labourers 'supplied' by the Headman of the area, and would be under the supervision of the Oshikango Office and the Councillor-Headmen of the area. Each gang was to be supplied with two shovels, two picks, a crowbar, a heavy sledge hammer, a windlass, a bucket, 100 feet of cable, a large saw, and a file for sharpening the saw, which were to be paid for by the Oukwanyama Tribal Trust Fund. In preparation for the timbering of the wells, the necessary poles were to be collected by locals under the supervision of their Headman. The Officer in Charge estimated that twenty gangs working from May to the end of October the following year should be able to sink around 70 wells.<sup>149</sup> In response to this proposal the Chief NC eventually approved that ten gangs should sink 30 wells with the progress to be reported.<sup>150</sup>

In October 1939, the Officer in Charge provided a report on the progress of 14 wells sunk, in which he concluded that "the scheme of sinking wells tribally has progressed most satisfactorily".<sup>151</sup> For each well, the report detailed the area, headman, 'Umkunda', sub-headman, and provided a description of its depth, water supply and timbering. Most wells were dug to a depth of about

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<sup>147</sup> *Ibid.*

<sup>148</sup> *Ibid.*

<sup>149</sup> *Ibid.*

<sup>150</sup> NAO [010] 5-7-1, Letter from the Chief Native Commissioner, Windhoek to the Native Commissioner, Ondangua on 15.02.1939.

<sup>151</sup> NAO [010] 5-7-1, Report from Officer in Charge, Oshikango to Native Commissioner, Ondangua on 03.10.1939.

70 feet with the deepest being 90 feet. Monthly wages were paid to the supervisors, but “some of the more progressive sub-headmen and their people have been sinking wells without the assistance of paid supervisors, but with the help of tools and gear issued by the loan office.”<sup>152</sup> The Officer was only able to inspect a few of the wells himself, with the others described to him by reports from supervisors. The Officer believed that supervisors were abusing the scheme of monthly wages by working slowly – spending two to three months to dig a 70 foot well – and that this was the case because he was not able to inspect the wells regularly himself, and because their supervision by the headmen and sub-headmen was not of “European standards.”<sup>153</sup> The solution was proposed to change the rate of pay to a footage rate, which would “reduce the necessity of continual supervision by this Office and consequently travelling expenses.”<sup>154</sup>

After the success of the 1939 expedition, another large-scale expedition to open water in the east was planned for July 1940. The official language used to describe the decision-making process maintains the ambiguity and unanimity of earlier accounts:

When at the beginning of the year the scheme of work for 1940 was being discussed with the Ukuanyama Council, it was decided that an effort should be made to destump the road from Ondingwanyama to Ombulu and Upiri (which is also the boundary between Ukuanyama and Ondonga) in order to make it passable for the tribal wagon and for cars; ten wells should be dug at various clearings in the bush east of Ompanda in order to endeavour to find permanent water for stock; sand waterholes should also be dug in that part of the country; whilst in Eastern Ukuanyama a small party of Headmen and I should

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<sup>152</sup> *Ibid.*

<sup>153</sup> *Ibid.*

<sup>154</sup> *Ibid.*

explore the bush east and south east of Omshilonga in order to find out whether the grazing and watering conditions would permit of the establishment of cattle posts there.<sup>155</sup>

Because infrastructural work in the eastern area was limited to a short and variable period, beginning after the requirements of agricultural work had been met and usually ending near the end of July when the last surface water from rainfall was still available, large-scale expeditions were undertaken to simultaneously sink wells, water-holes and destump roads. The Officer noted this problem of timing as one of the major constraints on the scheme,

work can only be carried on during a very limited period of the year, whilst there is water in the vleis and pools. This period unfortunately also clashes with the ploughing and reaping season and many men are reluctant to leave their kraals at that time.<sup>156</sup>

The harsh limitations of seasonal rainfall and its tendency to evaporate soon after tightened the entanglement of well-digging, road construction and agricultural work. For this work, "gangs of labourers" were supplied by each of the eight Councillor Headmen "proportionate to the population of their areas", as shown in the table below:<sup>157</sup>

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<sup>155</sup> NAO [010] 5-7-1, Report by Assistant Native Commissioner, Oshikango on 30.07.1940.

<sup>156</sup> *Ibid.*

<sup>157</sup> NAO [010] 5-7-1, Report by Assistant Native Commissioner, Oshikango on 30.07.1940.

Area	Headman	Number of Labourers engaged in Well Digging	Number of Labourers Employed in Road Work and Waterholes	Total
Ohaingu	Vilho	16	130	146
Efululula	Nandjebo	16	110	126
Onengeli	Kaluvi	16	80	96
Omedi	Nehemia	32	40	72
Enana	Elia	50	-	50
Onaminda	Katamba	16	20	36
Onekwaya	Lazarus (Acting)	16	50	66
Okalonga	Johannes	-	15	15
<b>Total</b>		<b>162</b>	<b>445</b>	<b>607</b>

Recruitment of workers remained the duty of the headmen, but the fact that it was to be proportionate to each group's population suggests that the colonial officials were taking a more central role in planning. Since the establishment of the Tribal Trust Fund, the officials regularly adhered to an axiom of proportionality whereby population size was determinant of payment, where payment could take the form of cash, grain or workers.

At the beginning of April, before the gangs set out, Headmen Elia, Vilho and Nehemia together with some of their 'followers' explored the east to choose and demarcate places for the digging of waterholes and the sinking of wells.<sup>158</sup> The well-diggers were then divided into ten gangs "each under a tribally paid supervisor" and instructed to each dig one well at one of six locations selected by the aforementioned Headmen.<sup>159</sup> When dividing up the gangs, "care was taken to put the Natives coming from the same area together and under their

<sup>158</sup> NAO [010] 5-7-1, Letter from Officer in Charge, Oshikango to Native Commissioner, Ondangua on 15.03.1940.

<sup>159</sup> *Ibid.*

own sub-headmen.”<sup>160</sup> In each gang of workers a few were tasked with fetching water in empty petrol tins, herding the pack of donkeys and looking after the camp. The leaders of each gang were given food rations for their workers, who were otherwise unpaid. 140 bags of corn were issued from the tribal granaries and stamped and dried by “the women of the tribe”.<sup>161</sup> The tools provided from the Oukwanyama Tribal Trust Fund consisted of 36 picks, 190 shovels, 10 spades, 32 axes, 10 crow bars, 10 sledge hammers, 5 saws, 10 bush picks, 40 empty petrol tins to carry water, and additionally workers brought with them their own axes and bush knives. The tribal wagon with pneumatic tires that was built in 1935 specifically for work in the eastern areas was hailed as “making all the difference” and was used throughout for transporting tools, food and water to working gangs.<sup>162</sup>

The Officer in Charge spent most of the time “riding on horse from one section to another, inspecting the work on the roads and the wells”, and interviewing supervisors on the progress of work. The report contains no description of what the wells looked like, and how they were sunk, except for a moment when the official describes his dismay at finding one of the gangs

using the old Ovambo method of digging wells, (i.e. instead of using the windlass to get the ground out of the well, a ladder was used on which a few men were standing and the ground was passed upwards in baskets) instead of employing the windlass and gear which had been supplied. Needless to say that this was immediately stopped.<sup>163</sup>

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<sup>160</sup> *Ibid.*

<sup>161</sup> *Ibid.*

<sup>162</sup> NAO [010] 5-7-1, Report by Assistant Native Commissioner, Oshikango on 30.07.1940.

<sup>163</sup> NAO [010] 5-7-1, Letter from Officer in Charge, Oshikango to Native Commissioner, Ondangua on 15.03.1940.

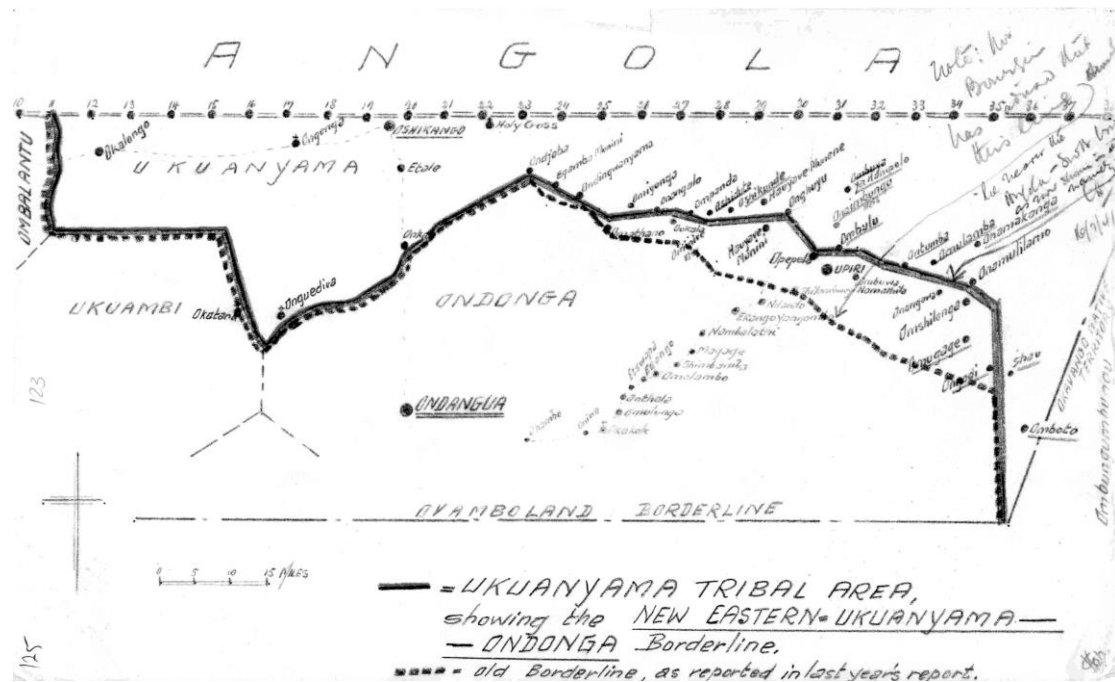
This informs us that the wells were being dug using ‘newer’ methods – specifically distinguished by the use of a windlass and bucket to remove soil, rather than a ladder and baskets – and that the older methods would not be accepted. Through another complaint by the officer, we are informed that it was much easier and faster work to dig a well in softer sandier soil than hard stone, and that only wells with stone sides were timbered. When a layer of hard stone or clay was reached, a fire was made on the rock to heat it and then sledgehammers were used to smash it. Most of the wells were dug so deep that they ran out of sandlines, although they ranged from 65-150 feet. Of the ten wells sunk, seven were between 105 and 150 feet deep and none of them struck water. The first wave of well-diggers was in the bush for six weeks, thereafter they were replaced by “fresh gangs” who worked in the bush for three weeks.<sup>164</sup>

The waterholes that were dug also found little success. Waterholes that didn’t find any water were connected to river beds and vleis in order that they would capture their water after these were filled by rainfall. This design was used before the arrival of colonials and had already being successfully utilised and established in several parts of eastern Ovamboland. Four small dams were also dug into the ground of a dry river bed, which would hold water after the rivers ran dry. The water-hole diggers worked closely with the road-makers, and dug holes along the route of the road. These workers worked out in the bush for four weeks before returning home.<sup>165</sup> A sketch map [Image 2] was attached to the report to indicate established settlements and the newly cut boundary between Oukwanyama and Ondonga:

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<sup>164</sup> NAO [010] 5-7-1, Report by Assistant Native Commissioner, Oshikango on 30.07.1940.

<sup>165</sup> *Ibid.*

Image 2<sup>166</sup>

The Officer in Charge reported in the following March that after discussions with the council headmen, they decided to sink 12 wells to establish cattle posts, and in May that after water was found in six of these that “they were prepared to undertake, without delay, the sinking of a further 16 to 20 wells.”<sup>167</sup> In the March meeting, it was decided to change the wage structure of well-diggers because they had “acquired some knowledge of well-digging”, and because the workers actively resented that only the ‘leaders’ were paid.<sup>168</sup> Therefore, “the Headmen suggested that the amount payable should be divided equally between the workers but that the leader should receive a few shillings extra.”<sup>169</sup> With this change, the planned structure of

<sup>166</sup> NAO [010] 5-7-1, Report by Assistant Native Commissioner, Oshikango on 30.07.1940.

<sup>167</sup> NAO [010] 5-7-1, Letter from Assistant Native Commissioner, Oshikango to NC, Ondangua on 30.05.1941.

<sup>168</sup> NAO [010] 5-7-1, Letter from the Assistant Native Commissioner, Oshikango to Native Commissioner, Ondangua on 06.03.1941.

<sup>169</sup> *Ibid.*

working gangs was changed accordingly: (a) eight workers, including the leader, were to constitute 'a gang'; (b) the 'gang' was to work until water was found and the well completed, or until it was decided by the Assistant Native Commissioner that water was unobtainable; (c) when the conditions set out under (b) were considered fulfilled the leader would receive 15/- and the other seven workers 10/- each; d) if the work had been exceptionally arduous, like digging through hard stone or to a depth of over 100 feet, the Assistant Native Commissioner could choose to pay the workers an additional 2/6 each; e) workers employed on 'tribal work', such as road making, well sinking, and the digging of sand water holes, outside the 'tribal area', were to receive corn rations from the Tribal Trust Fund granaries.<sup>170</sup> The Secretary for SWA commented that this change was "much fairer" and calculated that previously a 100 foot well cost approximately £4, and would now cost £9. Of the Ukuanyama's Tribal Trust fund of £2,500 and 10,500 bags of corn, £60 and 120 bags of corn were allocated to the digging of the initial twelve wells.<sup>171</sup> For the second wave of twenty wells, £200 was allocated.<sup>172</sup>

In relation to the wage structure of well-diggers, they were able to demand increased wages and demand a more equal pay between them. While these demands were ultimately agreed to by state officials, the official reports tell us that they were formally expressed by the headmen. This negotiation of the wage structure indicates a much more diffused allocation of agency between workers, headmen and officials.

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<sup>170</sup> *Ibid.*

<sup>171</sup> NAO [010] 5-7-1, Report from the Secretary to the Administrator of SWA on 20.03.1941.

<sup>172</sup> NAO [010] 5-7-1, Letter from the Secretary to the Administrator, Windhoek on 19.06.1941.

Of the initial twelve wells sunk, nine found water. Elia surveyed all the clearings designated for new wells, which had to be at a suitable distance from existing wells, in order that workers could have adequate supplies of water while digging. Where distances were further from water supplies, gangs consisted of 12 workers, while those closer had only 7. Even though the tribal wagon with pneumatic tires made transporting water easier, it was still necessary for new potential wells to be close to established water supplies in the dry season. Accordingly, the wells were spread out over the landscape in a particular pattern, where successful water-holes or wells provided “jumping off points” for more wells to penetrate further into the bush.<sup>173</sup> We are told that the only supervisors on the trip were Headman Elia, the Officer’s local interpreter and messenger Lukas Shilunga; no European supervision was done. The workers were in the bush for 6-8 weeks and water was found in nine of the twelve wells and none dug deeper than 150 feet as it was considered too dangerous.<sup>174</sup> A sketch map [Image 3] indicates where the initial twelve wells were sunk, and where the next twenty were intended to be sunk:

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<sup>173</sup> NAO [010] 5-7-1, Letter from the Assistant Native Commissioner, Oshikango to the Native Commissioner, Ondangua on 23.07.1941.

<sup>174</sup> *Ibid.*



towards the end of May.”<sup>177</sup> He proceeded to explain that married Ovambos who take up contract work in the south “always seem to be able to arrange with relatives and friends” for the reaping of their crops, and that well-diggers should do the same in order not to break “the continuity of most necessary work for which they receive pay.”<sup>178</sup> Hahn proceeded then in a threatening tone,

I think that the Headmen should be made to realise that this extension scheme is of far greater importance to the tribe as a whole, including the well-diggers, than supervision work in connection with harvesting of fields in which only a few are personally interested. It is considered too that some of the other Headmen should be called upon to give Headman Elia more active assistance in this undertaking.<sup>179</sup>

What we see here is that paid well-digging work is equated with paid migrant-labour work, as being of higher priority than agricultural work and as being specifically gendered as men’s work. Hahn also made clear that this well-digging work was a type of political work whereby the interests of the broader community had to be placed before the immediate interests of the family or kraal, and that the Headmen should enforce this new category of work. Moreover, there appears to be some discrepancy between the Assistant Native Commissioner and Native Commissioner, who seems much more accommodating of crop reaping requirements. It also indicates how such intimate the colonial officials’ knowledge of locals crops and agriculture was – seen here in the delayed month of reaping that year – and how necessary it was to the planning of water infrastructure.

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<sup>177</sup> NAO [010] 5-7-1, Letter from Native Commissioner, Ondagnua to Assistant Native Commissioner, Oshikango on 19.02.1942.

<sup>178</sup> *Ibid.*

<sup>179</sup> *Ibid.*

By 1943, the Native Commissioner appears to have grown disillusioned with well-digging prospects in the eastern area, concluding in the annual report that “well sinking operations in very difficult country many miles away from Oukwanyama proper, are proving an uneconomical proposition.”<sup>180</sup> The idea that the project was ‘uneconomical’ was raised again the following year in the annual report: “Taking this extension scheme as a whole however, it is uneconomical. The waterless and very sandy nature of the country and the difficulties of transport have proved very severe handicaps. The shortage of European staff too has very materially affected this scheme.”<sup>181</sup> Despite his lamentations, wells continued to be sunk in eastern Oukwanyama in collaboration with local colonial officials at a slow pace up to at least 1949, when the Administration began making concerted efforts to sink boreholes and construct large excavation dams in the area.<sup>182</sup>

As with the colonial attempts to produce a water infrastructure based on borehole technology, there was no clean slate upon which well infrastructure was built. In an attempt to ‘make do’ with limited knowledge, resources and capacities the colonial state necessarily adopted, adapted and reproduced various precolonial practices and forms of knowledge. These practices and forms of knowledge were not limited to water infrastructure, but were entangled in such diverse concerns as land ownership, territorial borders, cattle, national border disputes, seasonal agriculture, grain distribution, rainfall, cash wages, tribal ceremonies, the headmen council system, and group identity. In the production of well and waterhole infrastructure the

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<sup>180</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v16, Native Commissioner, OV, Ondangua, Annual Report for 1943.

<sup>181</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v17, Native Commissioner, Ondangua Annual Report for 1944.

<sup>182</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Extract from Quarterly Report by Assistant Native Commissioner Oshikango for Quarter Ended on 30.06.1949.

colonial state was thus deeply and utterly entwined with the native, and water infrastructure in turn was deeply entwined with everything else.

## CONCLUSION

In representing the indigenous rainmaking practices to a global audience, the official discourses of the colonial state routinely set up the native as an irrational and savage other. Correspondence with water diviners echoed a similar self-identity in opposition to the irrational, but in a hesitant and less assured manner. In relation to the production of water infrastructure in Ovamboland, colonial officials were forced out of practical necessity to 'make do' by understanding, adopting and adapting indigenous practices and knowledge. The processes and relations of this coproduction undermined the putative binary opposition and distance between the native and themselves.

Through a thick description of borehole sinking and well-digging in Ovamboland, I have attempted to convey the deeply entangled and mangled nature of water infrastructure. The messy and epistemologically contaminated nature of the processes involved, in which coloniser and colonised initiated, planned and worked together, should not be seen as an exception, or adjunct, to the colonial state. Rather it should be understood as an indication of the mutually imbricated nature of the colonial state – of how the self-perception of the colonial state necessarily included the 'other'. Through such a close inspection of water infrastructure, such simple narratives that employ binaries of coloniser and colonised, of oppression and resistance, become untenable. Similarly, periodisations based on so-called 'political' events derived from the 'centres of power', appear out-of-sync.

The wells, water-holes, water diviners, and failed boreholes in this chapter all make up a ground layer of water infrastructure in Ovamboland. In one sense, they were all concerned with the ground – with the nature of soil and sand, and digging down in order to reach water underground. In another sense, they all relied heavily on knowledges, practices and networks from the ground – rather than being directed from above, they were channelled from below. In yet another sense, they formed a layer of infrastructure that other layers of infrastructure would be built on.

### **Flows:**

### **Water, Labour, Money**

#### **THE REPORT OF THE SWA COMMISSION (1936)**

The South West Africa Commission was set up by the Union Government in 1934, purportedly to determine the ways “to secure a more efficient administration and a greater measure of content amongst the inhabitants” in its Mandated Territory.<sup>1</sup> Having “visited practically every town and district in South West Africa and held 48 public sittings, and examined 150 witnesses”, the Commission published its 500-page Report in 1936 in an effort to convince a nominally global audience of the benefits of South Africa’s rule over South West Africa.<sup>2</sup> In this programmed performance of self-representation, the Report reiterated the distance and binary opposition between the European settlers and the African natives, and paid particular attention to their interrelationship. In the discursive tradition of the colonial archive, the Report

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<sup>1</sup> SAIRR, 214 A, 916 – 88, ‘Report of South West Africa Commission’, U.G. No. 26, 1936, 5.

<sup>2</sup> *Ibid.*, 6.

can be seen as a sequel to the text presented to the League of Nations by Hahn in 1926.

As with the previous report, this one also compiled a separate section on each 'tribe'. In regards to the Ovambo people, the commission reported that

[i]n introducing new ideas among them the European should regard carefully the effect thereof on the structure of Ovambo society, since it would be dangerously easy to disrupt it by forcing the pace of progress, and, in so doing, to introduce greater evils than can be compensated for by the benefits of the new progressive measures.<sup>3</sup>

It portrayed the Ovambo people as helplessly stuck in a primitive condition, dependent on European influence in order to progress. At the same time, it made the argument that such primitive people need to be guided slowly into modernity, so as not to be corrupted by it. Their argument was that the native needed to be pruned of certain savage characteristics, which would not react well with modernity.

The commission considered indirect rule to be the type of political system that could best facilitate such a careful management of the Natives by the Europeans. It noted that

this system of indirect rule can best be carried out where Natives live apart from Europeans and have their own Chiefs or Headmen as well as their own laws and customs. Contact with Europeans has a tendency to detribalise Natives, which only too often leads to the abandonment by them of their own tribal laws and customs before they have reached a stage of development under which they can with benefit to themselves adopt European laws and customs. [...] Its

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<sup>3</sup> *Ibid*, 17.

comparative isolation will facilitate the introduction of only so much of European ideas and technique as the Natives are ready to absorb, and as is warranted from a consideration of their own needs. We consider, therefore, that Ovamboland can serve as an excellent laboratory for the study both of indirect rule and of the effects on a primitive race of a gradual introduction of more advanced methods.<sup>4</sup>

The colonial state's relationship to the native was thus presented simultaneously in terms of paternalism and laboratorial experiment. All forms of agency and expertise were vested in the European scientist who introduced various elements into the native environment. The native was in turn portrayed as a natural organism, which responded to these influences, and only these influences. European modernity was presented as necessarily opposed to native primitivism – as the influence of one increased the other would decline. While Hahn's 1926 report focused on the savagery of the native and the need for European influence, the 1936 report emphasised the importance of balance and measure of that influence. Water infrastructure was considered one of the principal sites of European developmental influences referred to in the report and also a central aspect of indirect rule. In the construction of dams in Ovamboland, however, the colonial state had to build upon the pre-existing water infrastructure and adopt native knowledge and techniques. In relation to water infrastructure, the analogy of a laboratory, with its sense of control and clean orderliness, was somewhat misleading.

This chapter continues from the last with a thick description of another layer of water infrastructure in Ovamboland characterised by excavation dams. Dam and well infrastructure were initiated at the same time by colonials, but

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<sup>4</sup> *Ibid*, 20.

with different purposes. They were both made forms of famine-relief work by the colonial administration in 1929, and both became intimately tied to the Trust Fund tax system, which was introduced in the same year in return for that famine-relief. Trust Fund grain and cash was used to finance the construction of dams and wells continuously after the initial projects in the 1929-1931 famine. As with wells in the first chapter, I attempt to show how dam infrastructure in Ovamboland was coproduced by colonial officials and natives, and how deeply entangled these categories were in their production. At the same time, I attempt to show the specificity of these processes in relation to dam infrastructure.

The second section of the chapter focuses on the Tribal Trust Fund system and its connections to water infrastructure in Ovamboland. As a financial infrastructure, the Trust Funds should be seen as another layer in the palimpsest that covers and joins wells and dams. I find that there is a discernable logic at play in the connections between water, labour, cattle, grain and cash that is animated by the concepts of flow and fixity. I trace this logic roughly but cautiously, and suggest that it indicates a colonial effort to 'fix' the Ovamboland economy, in order to be able to control the 'flow' of male labourers south.

### **THE FAMINE DAMS AND THE ORDINARY STORAGE DAMS**

Like well-digging, dam construction in Ovamboland drew from the colonial administration's earlier attempts at boring, was seen as an alternative to boring, and was undertaken under emergency conditions. The discourse of emergency in reference to famine conditions, however, made water in Ovamboland increasingly a concern of central planning and administration to

be addressed in technical terms and to be managed through technical expertise. This more centralised thinking was not however simply realised as the imposition of a total a priori colonial infrastructure. The colonial state was unwilling to invest resources into the development of a water infrastructure and had to make do with what worked on the ground. Making do on the ground was also necessarily linked to the dams' function as famine-relief, which shaped the construction process and designs as stipulated by officials on the ground. In the form of dams, water infrastructure in Ovamboland therefore continued to rely on a method of co-production which developed a set of layered practices and techniques of heterogeneous origin. Like well-digging, it incorporated networks of practices, techniques and institutions that produced new elites, community stratifications and institutions.

The first period of dam construction in Ovamboland began with a report by the Boring Engineer Traas in 1927, where he recommended that more success would be found in opening surface water in shallow pans and depressions, than with boring.<sup>5</sup> That year the administration sent two dam scrapers and ploughs to the Officer in Charge Hahn in order to construct 'excavation' dams.<sup>6</sup> These tools were unable to penetrate the hard soils in the dry season and so instead Hahn's assistant Eedes "used native labour with picks and shovels to build a good dam in the centre of the [Oukwanyama] tribe, and enlarged several water holes and reservoirs for storing flood water."<sup>7</sup>

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<sup>5</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Report from Mr Traas, Boring Engineer to the Secretary for SWA on 10.07.1927.

<sup>6</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Administrator, Windhoek to Hahn, Native Affairs, Ondangua on 07.09.1927.

<sup>7</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v1, Officer in Charge NA, OV. Annual Report for 1928.

These first excavation dams were followed by a major dam building project in a food-for-work famine-relief programme from 1929 to 1931. In this early phase, the construction of dams in Ovamboland was not a centrally planned attempt by colonials to impose a ready-made system that had been carefully designed and calculated, but rather an emergency ad-hoc response to water shortages and droughts that had to 'make do' with limited resources, time and personnel. The 'emergency' nature of dam construction was amplified by the decision to make it a form of 'famine-relief work' where workers were given grain in exchange for excavating dams. Due to their function as a means to distribute famine-relief, their designs and the processes involved in their construction conflicted with their other function to efficiently capture and store water.

As 'famine-relief work' these dams had to be situated near localities in need of famine-relief, they had to employ large numbers of local workers, and they had to be simple in design so that they could be supervised by people who did not have expertise knowledge. The result was 'ordinary storage dams' that adopted the design and practices of large indigenous dam infrastructure. These dams were constructed by hundreds of indigenous workers comprising mostly of women and children, who used woven baskets and other containers to remove the earth that had been excavated by men using picks and shovels. Construction of the dams relied on the cooperation of local headmen and chiefs, who were given valuable resources in tools and famine relief grain. These dams were typically deepened pans or excavations in or near oshanas or *ombarambas* that were filled by rain and flood water with the aim of storing water through the long dry season for people and cattle to drink from. The depth of the excavation dams was limited by a shallow saline water table, which if breached would render the dam water undrinkable. While they were

designed by an expert from the Department of Works, they were largely identical to indigenous dam infrastructure.

They were located in the areas where famine relief was deemed most needed, which was decided in consultation with local elites, rather than according to where colonials considered water infrastructure was most needed. Their location was also decided based on the colonial administration's relationship to different tribes and elites within them. As a result, the dams were entirely concentrated in the Ondonga and Oukwanyama localities. These decisions were largely taken by the officials on the ground, who directed and orchestrated the projects relatively autonomously from the central authorities. The construction of these dams was followed in 1933 by 'famine-relief work' that involved cleaning out the dams, while in 1939 again dam building was undertaken as part of 'famine-relief work', which was in turn again in 1941 followed by 'famine-relief work' that involved cleaning out dams. In 1946, 1953 and 1959 more dams were constructed, cleaned and widened as 'famine-relief work'.<sup>8</sup>

The initiation of dam construction in Ovamboland came in response to an investigative report by the Boring Inspector in early 1927, in which he concluded that more success would be found in opening surface water in shallow pans and depressions, than with boring. His report paid close attention to the local water infrastructures used by Ovambo people, noting that "the pans are all of an impervious nature and all hold water, the deeper ones for a considerable period after the rainy season. When water from these

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<sup>8</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v6, Native Commissioner, OV, Ondangwa, Monthly Report for October 1933, NAO Monthly and Annual Reports. NAO [018] 11-1v11, Native Commissioner, OV, Ondangwa, Annual Report for 1938, NAO Monthly and Annual Reports. NAO [018] 11-1v14, Native Commissioner, OV, Ondangwa, Monthly Report for May, June and July 1941.

pans is exhausted 'usuance' is sought from shallow wells which are sunk from 5 to 10 ft deep until a hard bed of impervious clay and lime is reached."<sup>9</sup> He also noted that the Oukwanyama and Ombalantu people west of Ondangua "show quite an intelligent method in water preservation. Large holes are excavated between a cluster of 'Injandi' or wild fig trees which minimises the drying out and evaporation very considerably. The depth of these holes varies from 6 to 10 ft according to the depth of the impervious lime and clay beds."<sup>10</sup> He deemed boring prospects to be poor, and these indigenous water infrastructure designs informed his opinion that "a good deal more should be done to open surface water by using dam scrapers for cleaning out shallow pans and depressions."<sup>11</sup> He proposed that they should be designed with protection from cattle and small stock to reduce fouling, and left with a minimal opening to reduce evaporation.<sup>12</sup>

This expert opinion informed the Administrator of SWA's declaration that the "consensus of opinion is that Ovamboland on account of its soil and the layout of the country is an ideal place for the conservation of water by means of ordinary storage dams."<sup>13</sup> The scope and parameters of this investigation by a technical expert recognised the limited finances, expertise and staff that the state would expend on developing water infrastructure in Ovamboland. In this way it was also an investigation into evaluating existing water practices and techniques with a view to incorporating and managing them. Before any dams were even constructed by the colonial administration, indigenous water infrastructural knowledge and practices had been studied

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<sup>9</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Report from Mr Traas, Boring Engineer to the Secretary for SWA on 10.07.1927.

<sup>10</sup> *Ibid.*

<sup>11</sup> *Ibid.*

<sup>12</sup> *Ibid.*

<sup>13</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Administrator, Windhoek to Hahn, Native Affairs, Ondangua on 07.09.1927.

and collapsed into the concept of 'ordinary storage dams'. The concept of 'ordinary storage dams' echoed the 'ordinary digging' that colonial officials resorted to in eastern Ovamboland after they had decided that borehole technology had failed.<sup>14</sup>

In 1927, in order to construct the first 'ordinary storage dams', the Administrator sent two dam scrapers and ploughs to Hahn, the Officer in Charge, informing him that the Administration expected "big things" from them.<sup>15</sup> In these early efforts there was a noticeable lack of centralised planning and involvement; the responsibility, impetus, design and decision-making were all left to the Officer in Charge. All he was given by the central administration was two dam scrapers, ploughs, and big expectations. The first attempt to construct 'ordinary storage dams', however, did not deploy the dam scrapers and ploughs, supposedly due to transport problems.<sup>16</sup> Instead, Eedes, the Assistant Officer in Charge,

called out the Ukuanyama natives and built a good dam with the aid of picks and shovels more or less in the centre of the tribe. He has also enlarged several water holes or reservoirs for the storage of flood water.<sup>17</sup>

Eedes was not a dam expert, and had already established strong relations with specific Oukwanyama headmen and sub-headmen who were experts at digging waterholes and sinking wells, so it would be fair to assume that the

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<sup>14</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from C. Hahn Officer in Charge, Native Affairs, Ovamboland to the Secretary for SWA, Windhoek on 14.10.1926.

<sup>15</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Administrator, Windhoek to Hahn, Native Affairs, Ondangua on 07.09.1927.

<sup>16</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v1, Officer in Charge NA, OV. Annual Report for 1928.

<sup>17</sup> *Ibid.*

design and construction of these dams relied largely on local Ovambo experts. Therefore, we see that the first 'ordinary storage dams' in Ovamboland were designed and constructed according to older Ovambo expert knowledge and practices, just like the first wells constructed through 'ordinary digging'.

The colonial administration attempted to construct dams using the dam scrapers in 1928, a year when water supplies were described as being "the worst since the 1914-1915 famine".<sup>18</sup> Several attempts were made at deepening existing pans and vleys using the ploughs and dam scrapers, but they were not strong enough for the tough soil. A further problem with the dam scrapers was that they needed to be pulled by oxen, which had been exhausted by other transport work. Other than the problem of the dam scrapers, the Officer in Charge claimed dam construction work was being held back due to supervision limitations. He claimed dam scraping work could only occur if it was supervised by one of the two colonial officials in Ovamboland, and that they had too many other duties that were more important. Due to the continued water shortages the colonial officials informed their superiors that they planned to carry out dam scraping in the near future to "ease the vital question of water in Ovamboland."<sup>19</sup> Up to this point the central administration considered the water problem one that could merely be outsourced to the colonial officials on the ground in Ovamboland, who in turn showed little interest or initiative in taking on the task.

In the drought of the late 1920s the first excavated dams were constructed by the Administration using hand labour. Many of these simple storage units having capacities of 3-6,000 m<sup>3</sup> are still in use today and pointed the way to

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<sup>18</sup> *Ibid.*

<sup>19</sup> *Ibid.*

providing carry-over water not only for the winter months but also for a succession of dry seasons.<sup>20</sup>

By the middle of 1929, consecutive droughts and failed harvests had led to a state of famine in Ovamboland and as an emergency response the colonial administration decided to initiate dam construction as a form of famine relief work.<sup>21</sup> The archive is scant here and does not really illuminate the thinking behind the choice of dam construction, nor the choice of famine relief work in general. We are however told that the decision to construct “these dams” was reached after the Administrator and the Director of Works held discussions with the Ondonga Chief Martin, where it was also agreed to implement a Trust Fund taxation scheme in exchange for the famine relief assistance.<sup>22</sup> The technical expertise of the Director of Works was immediately sought to design the intervention, while Chief Martin also appears to have been involved in the selection of this particular type of dam infrastructure as famine relief work. The annual reports for 1929 and 1930 merely tell us that “Boring machines have failed in this country and the Administration inaugurated a scheme of dam building”<sup>23</sup> and that “The idea of constructing dams was to feed the natives and at the same time organise them to build storage dams or reservoirs for their future benefit.”<sup>24</sup> It seems obvious that the decision to build these dams would have been informed by the Boring Inspector’s report from 1927, the recent experience of dams being successfully constructed using

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<sup>20</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 35.

<sup>21</sup> NAO, NAO [041] Famine, 34-1 Famine, Letter from the Director of Works, Windhoek to Hahn, Officer in Charge, Ondangua on 17.06.1929.

<sup>22</sup> NAO, NAO [041] Famine, 34-1 Famine, Letter from the Administrator, Windhoek to Hahn, Officer in Charge Ovamboland on 13.06.1929.

<sup>23</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1929.

<sup>24</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1930.

picks and shovels in 1927, followed by the failures with the dam scrapers and ploughs. What we see here is a state of emergency triggered by drought and famine, which placed the question of water at the fore of the upper echelons of the colonial administration, and turned water into a technocratic object that commanded a more centralised approach to planning.

### THE DIRECTOR OF WORKS: DESIGNS AND INSTRUCTIONS

Under the pretext of a famine emergency technical expertise was sought from the Director of Works (henceforth, DoW) who was sent to Ovamboland in June 1929 to arrange plans for the construction of six famine relief dams in Ondonga, where the effects of the famine were considered worst.<sup>25</sup> The design of the dams were to be “similar to the native built ones”, which were noted to have been “of tremendous benefit to both man and beast in the last drought”, but were to be larger in order to hold water from one season to another.<sup>26</sup> The DoW sent plans and instructions to the Officer in Charge with drawings showing the method of construction before making his visit. These instructions indicated that dams were to be located in *iishana* or *ombarambas* with an exploration trench to be dug first in order to make sure the underlying material did not indicate salt or salt water. Each dam was then to be excavated to a maximum depth of 17 feet with 10,000 cubic yards of soil removed and made into dam banks below and above the oshana bed level.<sup>27</sup> Rows of trees were to be planted on the spoil banks to reduce evaporation, while a fence or hedge was to be erected around the dam to prevent cattle

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<sup>25</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Monthly Report for June 1929.

<sup>26</sup> *Ibid.*

<sup>27</sup> NAO, NAO [041] Famine, 34-1 Famine, Letter from the Director of Works, Windhoek to Hahn, Officer in Charge, Ondangua on 17.06.1929.

from accessing it directly. There were also instructions for maintenance that recommended periodically removing silt in the dams using wheelbarrows or dam scrapers, and if the water became salty, lining the bed with a layer of clay. Rather than a carefully planned totality, the DoW's plans consisted of basic rules and principles drawn from the Boring Inspectors earlier report, that were open to adaptation and accommodation to varied circumstances on the ground in their implementation.

The Boring Inspector's report and the DoW's designs reiterated certain aspects of indigenous dam infrastructure that were also apparent to earlier European visitors. For instance, in 1880 the missionary Duparquet accompanied a group of hunters who crossed the floodplain between Uukwambi and Ombadja West.<sup>28</sup> These travellers commented on the surprising size of large royal ponds and the prevalence of smaller waterholes.<sup>29</sup> Duparquet described the area as "filled with nice ponds with clean and clear water surrounded by beautiful trees, palms, and Oquandes."<sup>30</sup> The vegetation surrounding dams was also commented on by the Boring Inspector and incorporated into the DoW's design. In his report, the Boring Inspector understood this feature in terms of reducing evaporation, rather than evidencing a natural Eden with bountiful fruit. Based on oral sources, Kreike claims that these large excavated ponds were called *oitenemba* in Oshiwambo and were typically constructed by many workers by deepening and improving pans, with the excavated material used to build up the banks.<sup>31</sup> Another type of dam (singular *etale*, plural *omatale*) was typically constructed in or beside *iishana* and *omarambas* to harvest floodwater, often

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<sup>28</sup> Kreike, *Re-Creating Eden*, 16-7.

<sup>29</sup> *Ibid*, 18.

<sup>30</sup> Duparquet, 1882 Journal, 9-12, 14 July 1882, AGCSp in Kreike, *Re-Creating Eden*, 16-17.

<sup>31</sup> Kreike, *Environmental Infrastructure in African History*, 108.

with a dike constructed to divert the water.<sup>32</sup> The built up banks, and the placement beside or in *iishana* and *omarambas*, were both central features of the DoW's designs.

Considering that the characteristics in the DoW's designs were all common features of local Ovambo dam infrastructure, one could say that these 'ordinary storage dams' designed by the DoW were really more 'ordinary' to local people than to colonials. One could say that far from being a dominating colonial imposition onto an indigenous population, they actually embodied indigenous practices and knowledge. This is true and valuable considering how it complicates the binary of colonial and native. But merely stating it in those terms misses a crucial point, namely that the production of these 'ordinary storage dams' actually synthesised and negated the distinction between categories of the colonial and the indigenous to produce a new category – a new 'ordinary'. This third category is seemingly blank and undefined. Symbolically, it is pure potentiality in waiting, a suspension of definition, and in its lived experience it is purely pragmatic. Not only did the production of these dams produce a new category, but materialised it in the everyday lives of local people and colonial officials through the new physical infrastructure. This new way that was neither simply colonial nor purely indigenous was informed and defined by the experience of producing and using it. The effects of this infrastructure were lived as the effects of this third category, they were experienced as life under this new way. This is why it is so valuable to infrastructure: it is at this level of the technical discussions of infrastructure that the colonial state shows its closeness to the native, that it undermines the binaries manufactured and represented in other parts of the archive.

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<sup>32</sup> *Ibid.*

## COSTS, CALCULABILITY, CONTROL

While the design of the dams left room for adaptation, the calculated costs involved were more precise and rigorous. The DoW calculated that each dam would take 4 months to complete by a gang of 100 men, and the costs in food were calculated accordingly with the total expenditure limited to £5000. According to these specifications 500 picks, 750 pickhandles, 400 shovels, 100 spades, 120 wheelbarrows, 2400 feet of 9" timber, 2 tents, 18 felling axes, 2 portable forges, 2 bags of smithy coal, 6 drill hammers, 12 drill hammer handles, 2 smith hammers, 2 grindstones, 2 anvils, 12 crowbars, 150 feet of drill steel were sent to Ovamboland along with two specifically white foremen who were to act as supervisors along with Hahn and Eedes.<sup>33</sup> The magnitude of tools and resources made available for this work was unprecedented in the area.

The greatest expense for the famine relief project was the transportation of grain to Ovamboland. The grain was imported from the Union of South Africa to Windhoek, from whence it travelled by railway to Tsumeb and then from Tsumeb to Ondangua by lorry. In 1929 a total of 2500 sacks of grain were transported to Ondangua by five government lorries, and in 1930 after the scale of dam construction radically increased and spread to Oukwanyama, 11,978 bags of grain were transported by 16 private contractors of which 9783 were issued to workers, 875 given free to the old and blind, and 1261 sold for cash.<sup>34</sup> From Ondangua the grain was transported to depot sites

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<sup>33</sup> NAO, NAO [041] Famine, 34-1 Famine, Letter from the Director of Works, Windhoek to Hahn, Officer in Charge, Ondangua on 17.06.1929.

<sup>34</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1929. NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1930.

by the Native Commissioner, where it was stored and then transported onwards to dam sites. Grain for relief work in Oukwanyama was also bought from Portuguese traders in Angola and stored at a central depot at Oshikango from whence it was distributed by the Officer in Charge.<sup>35</sup> The primacy of recruiting migrant labour was always present, even under the emergency conditions, and the returning empty trucks were used to transport recruits to the railhead in Tsumeb, which the Officer in Charge considered “greatly assisted in stimulating the recruitment of labour.”<sup>36</sup> The broader scheme of supplying famine relief in exchange for labour recruits was realised literally in these lorries that carried grain in, and workers out.

Under the perceived emergency conditions, water in Ovamboland became a technocratic object that needed to be accurately calculated and efficiently dealt with. The technical expertise of the Director of Works was drawn in to plan the scheme with calculable measurable units where the output of work over time could be calculated according to the number of workers and their payment in food. The dual mandate for improving the future water supply and providing immediate famine relief, however, provided competing objectives for this efficiency. It complicated the calculations and opened up space for contending interpretation.

From the outset the DoW’s plans and calculations met with discrepancies on the ground. The plans and calculations were based on the assumption that it would be most efficient for 100 men to would work on each dam, while the reality was that the vast majority of workers were women and children. The effect was that “work received for rations issued is consequently far below

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<sup>35</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Native Commissioner, Ovamboland to Secretary SWA, Windhoek on 18.09.1930.

<sup>36</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1929.

that taken into account when the DoW drew up his plans."<sup>37</sup> The scale of the famine-relief work was subsequently increased with more rations provided by the government and by the end of the large scale famine relief work in April 1931 a total of 32 dams had been constructed with a daily average of 1822 men, 7302 women, and 2301 children employed.<sup>38</sup> The ratio of women to men workers was considered by colonial officials in terms of efficiency and economy, as expressed in a letter from Hahn to the NC in 1930:

There is a limit to the number of women that can be economically employed per man, approximately under the very best circumstances 5 women to every man and I am of the opinion that if that ratio is exceeded a waste of labour must ensue. It must be admitted that the better pick men work the more women can be employed. To get the most work out of native labourers good supervisors are necessary and for that reason a fair comparison cannot be drawn between work supervised by Europeans or other experienced persons and works which are supervised by natives selected from the Ukuanyama tribe, who sole authority is tribal; quite apart from the well known fact that the native idea of a days work is not the same as ours. It is impossible for me to visit the various works more than once a week and in the intervals the only control is the natives appointed. It is however hoped to increase the working ratio between men and women.<sup>39</sup>

Patricia Hayes has argued that the state discouraged men from staying in Ovamboland and performing famine labour as they were expected/ intended to become migrant labourers, while women were encouraged to stay and work for famine relief, and that this occurred "on the basis of a division of

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<sup>37</sup> NAO, NAO [041] Famine, 34-1 Famine, Letter from Officer in Charge Ondangua to Secretary SWA, Windhoek on 11.10.1929.

<sup>38</sup> NAO, NAO [041] Famine, 34-1 Famine, Report from Officer in Charge Ondangua dated 1932.

<sup>39</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 09.10.1930.

labour endorsed by the state, on terms dictated by the state.”<sup>40</sup> While the broad sentiment is largely accurate, the claim that an entity called ‘the state’ asserted a unanimous intention in this regard can be further interrogated. The official archive contains contradictory claims as to why so few men worked on dam construction, which suggests a less coherent and consistent state at work. In his letters to the Secretary for SWA, Hahn claimed that there were too few able-bodied men left to employ in dam construction and that he struggled to find sufficient men for pick work as they were “making a desperate effort to save their stock”, which in times of drought required more men to herd smaller groups of cattle.<sup>41</sup> Hahn also continued to encourage labour recruitment and in another letter attributed the lack of available men in famine stricken areas to the fact that “able-bodied men who otherwise would not have left the country have been compelled to take up employment in order to earn money to provide for their families.”<sup>42</sup> As a result Hahn claimed he was “compelled to give work to the older classes, men and women, to enable them to earn a livelihood”<sup>43</sup> and that despite being unable to work as hard as younger men they “had to be employed and counted as workers otherwise it would have meant giving them free issues of meal.”<sup>44</sup> Yet in a later letter to the Native Commissioner Hahn, the Oshikango Officer in Charge says “[y]our instruction[s] in regard to the class of male labour have been given affect to as far as possible.”<sup>45</sup> And in his monthly reports to

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<sup>40</sup> Hayes, “The ‘Famine of the Dams’”, 137, 144.

<sup>41</sup> NAO, NAO [041] Famine, 34-1 Famine, Letter from Officer in Charge Ondangua to Secretary SWA, Windhoek on 31.12.1929.

<sup>42</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1929.

<sup>43</sup> NAO, NAO [041] Famine, 34-1 Famine, Letter from Officer in Charge Ondangua to Secretary SWA, Windhoek on 11.10.1929.

<sup>44</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1930.

<sup>45</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 09.10.1930.

Hahn on the amounts of issued grain, he certified “that only men who do not usually go south to work are employed, Kraal heads, old men and persons in charge of stock and kraals etc.”<sup>46</sup> This seems to indicate that Hahn was deliberately implementing some kind of policy regarding the employment of certain ‘classes’ of men despite claiming otherwise to his superiors. Without attempting to debunk these seemingly contradictory communications between officials, we can appreciate that at different levels of the state, officials did not operate in a totally coherent and consistent way and that they acted according to various, and sometimes competing, beliefs and agendas at different moments.

The gendered divisions in dam-construction were emphasised when it came to the supervisor issuing grain rations at the end of each working day. Women, men and children were made to form separate regimented queues to receive their grain issues in the same handwoven baskets that were used to carry soil out of the excavations. These disciplined queues were photographed by Hahn in 1929 and attached to his reports to his superiors in Windhoek. Hayes beautifully unpacks the politics of how these photographs were specifically curated and framed by Hahn to emphasize different features.<sup>47</sup> She notes that the enforcement of rigid queues and the separation of people into categories of men, women and children suggest a colonial desire for order.<sup>48</sup> Furthermore, the scale of the populace depicted and the use of a wide lens on the camera to produce an engulfing panoramic view,

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<sup>46</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, September Report from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 09.10.1930.

<sup>47</sup> Patricia Hayes, “Northern Exposures: The Photography of C.H.L. Hahn, Native Commissioner of Ovamboland 1915-1946”, in Wolfram Hartmann, Jeremy Silvester and Patricia Hayes (eds.), *The Colonising Camera: Photographs in the Making of Namibian History* (Cape Town: Cape Town University Press, 1998).

<sup>48</sup> *Ibid*, 90.

suggest control.<sup>49</sup> I would add that colonial control is further symbolised in these photos [Images 4-7] by the supervised organisation of people in the queues, who are represented as evenly spaced units of labour like counters on an abacus.



Image 4<sup>50</sup>



Image 5<sup>51</sup>

<sup>49</sup> *Ibid*, 90.

<sup>50</sup> Digital Namibian Archive, Cocky Hahn Collection, <http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

<sup>51</sup> Digital Namibian Archive, Cocky Hahn Collection, <http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

Image 6<sup>52</sup>Image 7<sup>53</sup>

### NETWORKS OF SUPERVISION IN HAHN'S FIEFDOM

The tensions and inconsistencies between different colonial officials regarding the number of men, women and children employed in famine relief work is also a symptom of a broader conflict apparent in the dual mandate of improving the future water supply while simultaneously providing immediate famine relief. The plans from the DoW were more focused on the efficient construction of dams than on the means of effectively distributing

<sup>52</sup> Digital Namibian Archive, Cocky Hahn Collection, <http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

<sup>53</sup> Digital Namibian Archive, Cocky Hahn Collection, <http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

famine relief, while Native Commissioner Hahn and other officials on the ground were more concerned with the dams as a means to distribute grain. In the implementation of the DoW's plans Ovamboland colonial officials took initiative in adapting it accordingly.

At the start of the dam construction, Hahn took the decision to employ older men, women and children as workers in order that they receive famine relief food and he extended the working schedule to accommodate for the slower construction. He also adapted the working schedule of dam construction to allow for dam workers to prepare their fields after the first rains, and suspended work when the dams were inundated after the first rains in October.<sup>54</sup> The DoW instructions prescribed the location of dams according to purely environmental and physical criteria, while Hahn selected dam locations according to his own rubric which took into consideration the requests of local elites, planning the future distribution of the population, the distribution of existing water infrastructure and where food was most needed. Hahn also took the decision to introduce other forms of water infrastructure as part of famine relief work, at the end of 1929 he initiated work enlarging and deepening waterholes closer to famine stricken areas that were unable to access the dam sites, and asked his superiors retrospectively that he be authorised to use his discretion to initiate new works where he deemed them necessary.<sup>55</sup> Midway through 1930 at the request of Hahn it was decided to continue and expand the famine relief programme in Ondonga and extend it to Oukyanama, where the officials on the ground increased the scope of famine relief work to include well-digging.

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<sup>54</sup> NAO, NAO [041] Famine, 34-1 Famine, Letter from Officer in Charge Ondangua to Secretary SWA, Windhoek on 11.10.1929.

<sup>55</sup> NAO, NAO [041] Famine, 34-1 Famine, Letter from Officer in Charge Ondangua to Secretary SWA, Windhoek on 31.12.1929.

All the central administration in Windhoek had in order to hold the Ovamboland Officials to account were their reported tallies evidencing the distribution of grain. By the end of 1930, the tensions around the conflicted objectives of efficiency together with the unaccountability of Hahn's inflated authority spilled over into central Administration concerns over financial costs:

The country's finances are in such a bad state... It seems cost of drought measures in Ukuanyama area is working out rather higher than anticipated. ... It cannot be too strongly urged on you that the Administration is only able to provide food which is necessary to keep natives from starvation. No dams or other works, however necessary they may be for the natives, can be undertaken if their construction involves expenditure which can be avoided; such works will have to remain over until a later date when the natives out of their Tribal Trust Funds are in a position to undertake them themselves.<sup>56</sup>

The first six dams constructed in Ondonga from mid 1929 were supervised by the Ovamboland colonial Officials, two European 'gangsters' sent up specifically, and Finnish missionaries. In the first phase colonial officials remained adamant that supervision could only be carried out by 'Europeans'. After the scheme was significantly expanded in 1930, however, the colonial officials reluctantly recruited local supervisors. Colonial officials' racialised thinking around supervision was elucidated by the Oshikango Officer in Charge in 1930:

To get the most work out of native labourers good supervisors are necessary and for that reason a fair comparison cannot be drawn between work supervised by Europeans or other experienced persons and works which are supervised by natives selected from the

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<sup>56</sup> NAO, NAO [041] Famine, 34-1 Famine, Letter from the Administrators Office, Windhoek to Hahn, Officer in Charge, Ondangua on 15.12.1930.

Ukuanyama tribe, who sole authority is tribal; quite apart from the well known fact that the native idea of a days work is not the same as ours.<sup>57</sup>

The selection of local supervisors for dam construction made new claims on elite status, political authority and the colonial state. In order to achieve a particular function, these supervisors momentarily entered into an assemblage that represented the colonial state. In Ondonga most supervisors were Finnish missionaries and colonial employees, and the only local supervisors were Chief Martin and two local mission teachers. While these figures had varying and sometimes competing claims to authority, they were given the same responsibilities and privileges. As supervisors they were responsible for distributing the much-needed food relief to workers every day, they were given access to valuable tools and were vested with a degree of ownership over the completed dams.

In Oukwanyama, where the council headmen system was being developed, the supervisors consisted of headmen Shiamba and Hamkoto Kaluvi, sub-headmen Moses Amnera, Ita, Enghono, Kukenge, Simson and the official interpreter Nehemia.<sup>58</sup> At the end of dam construction, in a report to his superiors the Oshikango Officer in Charge evaluated and praised these supervisors and also noted the “valuable cooperation” of the Ruling Headmen Shermoferne; Jikuma; Ashiana; Shiamba; Kamulu; Hamkoto Kaluvi; Hamkoto Wakapa and Shetekera.<sup>59</sup> Supervisors in Oukwanyama were rewarded with bags of grain, and some headmen and sub-headmen also

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<sup>57</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 09.10.1930.

<sup>58</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 03.03.1931.

<sup>59</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Native Commissioner to Secretary for SWA on 06.05.1931.

applied for and received corn on credit from the administration in order to provide for their subjects “which their status obliged them to”.<sup>60</sup> In Oukwanyama, famine relief work and supervision partially informed and reified the role of headmen and the council system. It placed new claims on their obligations to their subjects and linked this directly to their cooperation with colonial officials. It also acted as a mechanism for colonial officials to test headmen, and as such became part of the states criteria for selecting and endorsing headmen.

Supervision work did not operate smoothly. Despite famine conditions supervisors sometimes struggled to recruit enough people to work in exchange for grain and sometimes they were only able to recruit children.<sup>61</sup> When crops were ripening and being picked at the end of April in 1930, the numbers of workers at dams dropped drastically.<sup>62</sup> When the progress of work on a dam was considered unsatisfactory by officials, it was typically attributed to the supervisors “lack of control”, and on some occasions to a lack of cooperation from the sub-headmen in the area.<sup>63</sup> On one occasion, the officials claimed that a supervisor and headman were misappropriating grain rations and “were in the habit of allowing the natives to leave work in the mid-afternoon.”<sup>64</sup> When the supervisor was dismissed, there was a “semi-boycott” by the workers, some of whom then found work at another dam

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<sup>60</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 03.03.1931.

<sup>61</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 12.01.1931.

<sup>62</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Ondangua, Ovamboland to the Secretary for SWA on 02.04.1930.

<sup>63</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 12.01.1931. NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 09.10.1930.

<sup>64</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 16.11.1930.

site.<sup>65</sup> Colonial Officials also complained to their superiors that the official procedure of recording issues of grain in units of bags and fractions of bags was failing because “the issues are made by native supervisors, who have no conception whatsoever of the fraction of a bag.”<sup>66</sup>

While the officials on the ground complained to each other about the capabilities of ‘native’ supervisors, Hahn told the story differently in his annual report of 1930 to superiors. He depicted the employment of native supervisors as a colonial triumph of education and progress:

At several of the dams, supervision work is being done by the natives themselves and there are many today who have learned a very economical and practical way of building dams. The system is simple and they have grasped the important points.<sup>67</sup>

In his reports to superiors, Hahn depicted the natives as obediently following instructions under his control. His reports were a performance of his expertise in handling the natives and a vindication of his decisions to adapt the centrally designed plans as he saw fit.

Dam construction famine relief work was limited to Ondonga and Oukwanyama, where colonial officials had established headquarters and concentrated their influence. In the western areas, famine conditions were also severe, but colonial officials left the provision of famine relief in those areas to missionaries. As a result of this uneven distribution of famine relief officials claimed that “natives from distant areas, where there are no relief

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<sup>65</sup> *Ibid.*

<sup>66</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 09.10.1930.

<sup>67</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v3, Officer in Charge NA, OV. Annual Report for 1930.

works, flock to Ondangua where they are sure of receiving food.”<sup>68</sup> Officials repeatedly reported that in Uukwambi Chief Iipumbu continually refused famine relief from the colonial officials, and they claimed that “many of his subjects have moved over to Ukuanyama and Ondonga to obtain food by working on the dams.”<sup>69</sup> Colonial Officials were apparently unwilling to organise construction work without the cooperation of the Chief.

### THE MATERIAL WORK OF DAM CONSTRUCTION

Despite standardized instructions, dam construction did not follow a standard procedure, but varied and adapted according to a myriad of factors on the ground. The first dam constructed at Ondangua began by cleaning out an old waterhole, but the work received so many workers in need of food relief that the waterhole was enlarged to a size of 120 by 45 feet with a depth of 22 feet. This enlarged waterhole was then connected to another 140 square feet dam that was constructed beside it.<sup>70</sup> Dams were most often constructed over the sites of old waterholes and their location in natural depressions meant their dimensions had to be adapted to fit, rendering them much narrower than stipulated by the DoW. The dimensions of dams thus varied depending on the nature of their location and the features of the depression or waterhole they were built on. In locations with several good waterholes, work

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<sup>68</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Ondangua to Secretary SWA, Windhoek on 02.05.1930.

<sup>69</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Native Commissioner, Ovamboland to Secretary SWA, Windhoek on 09.11.1930.

<sup>70</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v3, Officer in Charge NA, OV. Annual Report for 1930.

to enlarge and clean them was undertaken in conjunction with dam construction, while at other sites wells were sunk near dams.<sup>71</sup>

Official reports leave only scattered traces of the material processes involved in dam construction. I find an adjunct archive in the photographs of different aspects of the construction of the dams taken by Hahn in 1929. Most dams began by laying out a cross trench and marking out the location of the spoil banks. As the dams were usually located on old waterholes or pans, the cross trenches were usually cut across a circular depression by men using picks. After the main cross trenches were completed, further minor cross trenches were cut to form a web of trenches, which culminated in the 'centre block' being 'cut out'.<sup>72</sup> After the centre block had been removed, the excavation and removal of the remaining sections between the trenches followed. The photographs in the next page [Images 8-9], taken by officials in 1929, indicate different stages of the process at two different locations.

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<sup>71</sup> *Ibid.*

<sup>72</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 09.10.1930.



Image 8<sup>73</sup>



Image 9<sup>74</sup>

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<sup>73</sup> Digital Namibian Archive, Cocky  
<http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

Hahn Collection,

<sup>74</sup> Digital Namibian Archive, Cocky  
<http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

Hahn Collection,

Three distinct types of work were combined to excavate dams. Picks were swung into the ground with great effort and force to 'cut' and loosen the hard soils. After a sufficient amount of soil had been loosened, shovels were used by other workers to lift the loose soil into piles outside the dams or directly into the handwoven baskets, which once filled were balanced on people's heads and carried out of the excavation where they were deposited to form the spoil banks. The photograph below [Image 10] shows men with shovels at the fore with a pile of soil behind them, from which women and children fill their baskets and carry them out to the spoil banks.



Image 10<sup>75</sup>

Images 11 and 12 show adult men 'cutting' the earth with their picks and women and children carrying the soil in their baskets. This gendered division of tasks and technology neatly dovetailed into Hahn's vision for an Ovambo Tribal world.

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<sup>75</sup> Digital Namibian Archive, Cocky Hahn Collection, <http://dna.nust.na/hahn/index.html> visited on 15.02.2019.



Image 11<sup>76</sup>

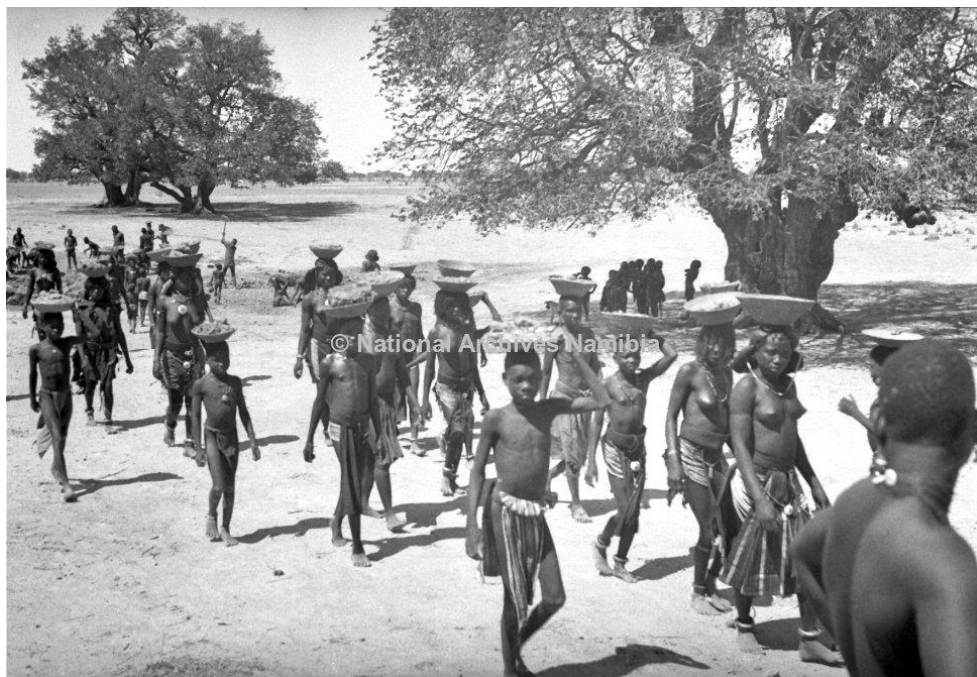


Image 12<sup>77</sup>

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<sup>76</sup> Digital Namibian Archive, Cocky Hahn Collection, <http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

<sup>77</sup> Digital Namibian Archive, Cocky Hahn Collection, <http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

Different types of work were allocated to different categories of people. Adult men were tasked with pick-work and shovel-work, while women and children were tasked with carrying soil in handwoven baskets [cf. Image 13].



Image 13<sup>78</sup>

Hayes notes that clear separation into different categories in the photographs emphasised order.<sup>79</sup> The spoil banks were constructed by women and children who carried the spoil material out of the dam using handwoven baskets and deposited it to form raised banks above and below the dam in the oshana bed. The design of the spoil banks varied depending on the location of the dams, being adapted to specific gradients and features on site in order to best enlarge the capacity.<sup>80</sup> In Image 14, the handwoven baskets are shown being balanced on people's heads as they walk to deposit them at the spoil banks.

<sup>78</sup> Digital Namibian Archive, Cocky Hahn Collection, <http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

<sup>79</sup> Hayes, "Northern Exposures", 90.

<sup>80</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 09.10.1930.

Image 14<sup>81</sup>

Image 15, however, shows an excavation site where the side was too steep to walk up, and so steps were cut into the hard soil of the wall where women and children perched to form a chain along which baskets of excavated material were passed up and out to the spoil bank. This method of constructing steps into the hard soil echoes the designs of traditional wells and dams that used spiral steps to delve downwards into the ground. It prompts questions about the design, expertise and authority in the construction of these dams. For instance, to what extent were more traditional practices and methods of construction as these employed? And who proposed and decided on their use? Colonial officials only inspected construction work every other week, leaving supervisors with much autonomy to decide the techniques and designs.

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<sup>81</sup> Digital Namibian Archive, Cocky Hahn Collection, <http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

Image 15<sup>82</sup>

During construction some dams were flooded by rain water, which washed in the incomplete spoil banks and shrunk the size and depth of the excavation. Work on these dams was usually then suspended until sufficient water had evaporated, but on other occasions when rains fell near enough the end of the planned construction schedule and soil washed in, the dam was abandoned with the idea that local inhabitants could clean it out in the future.<sup>83</sup> The nature of the soil surrounding dams also determined how much soil would wash into them and subsequently how regularly they would need to be cleaned out – in porous soil more silt washed in than in harder soils, and since dams were typically located in *iishana* and *ombarambas* where soils were more porous this was a regular occurrence. In dams where the bed was too porous water seeped away, and in these cases the black loam silt that gradually washed in was left to settle and form a more impervious layer. Black loam soils were more impervious, and dams built in these soils lost less water

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<sup>82</sup> Digital Namibian Archive, Cocky Hahn Collection, <http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

<sup>83</sup> *Ibid.*

through seepage.<sup>84</sup> Porous dam beds were also covered in clayey soils by hand to form an impervious coating. The photograph below [Image 16] shows the continued construction of a dam filled with rain water.



Image 16<sup>85</sup>

The depths of dams varied significantly. Several dams couldn't reach depths greater than 9' as salt water was reached below that depth, but others were dug to depths of 18'.<sup>86</sup> On a few occasions the initial exploratory trench pierced the clay bed in such a way that salt water could not be stopped from infiltrating the dam after its construction and it had to be abandoned. The depth of dams was also constrained by the hardness of the soil. Where the soil was harder, pick work was strenuous and construction consequently took longer and often ended before the intended depth was achieved. In some

<sup>84</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v4, Native Commissioner, OV Annual Report for 1931.

<sup>85</sup> Digital Namibian Archive, Cocky Hahn Collection, <http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

<sup>86</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v3, Officer in Charge NA, OV. Annual Report for 1930.

places, construction work was altogether suspended because the soil was too hard to penetrate.

Principal Headmen were consulted in selecting the sites of dams in their areas and they were regarded as being well located when they were near large grass flats for cattle grazing and when they had a good catchment area to capture rain water.<sup>87</sup> In this regard they were usually constructed in *iishana* or *omarambas*. Sites near belts of trees were favoured as they were protected from winds that accelerated evaporation, and at sites without trees they were planted around the completed dam. Construction sites also needed to be situated near sources of drinking water for construction workers to drink. Water could only viably be transported short distances, so the location of dams was limited to the proximities of other water infrastructures such as wells and waterholes. Some sites had two dams constructed in close proximity because there were no suitable sites further away that were also sufficiently close enough to the settlements where people needed the famine relief. Other dams were constructed despite being poorly located according to these criteria – due to the severity of the famine conditions in those areas and the need for relief. Dam sites were also selected specifically in densely populated areas in order to supply more people with famine relief and a future supply of water. At the same time, colonial officials attempted to use dams to influence settlement patterns, and to spread and distribute the population over larger areas. To this end, dams were to be constructed further away from concentrated populations in order to encourage resettlement in less populated areas.

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<sup>87</sup> NAO, NAO [041] Famine, 34-2 Famine Reports, Letter from Officer in Charge Oshikango to Native Commissioner, Ovamboland on 09.10.1930.

The time it took to construct dams also varied greatly. In areas with larger numbers of older people the period of relief work was extended in order to supply relief rations over a longer period. In cases when the same group of workers were re-employed to construct a second dam, colonial officials noted that they were better organized and construction progressed much faster having already learnt the requirements and skills.<sup>88</sup> Construction time also varied according to the hardness of the soil, the timing of the work in relation to the agricultural calendar, and the interruptions of rainfall.



Image 17<sup>89</sup>

In the years immediately following the construction of the dams, colonial officials regularly reported on their fullness to the central administration. In the beginning these reports testified to the success of the dams. In 1931, officials reported that the “water supply in Ondonga and Ukuanyama was considerably eased during the dry months by the storage dams constructed during the famine.”<sup>90</sup> After the rains had filled the dams they found that “the most important” dams held water right through the dry season while some of the dams dried up in September and October because they hadn’t been

<sup>88</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1930.

<sup>89</sup> Digital Namibian Archive, Cocky Hahn Collection, <http://dna.nust.na/hahn/index.html> visited on 15.02.2019.

<sup>90</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v4, Native Commissioner, OV Annual Report for 1931.

sufficiently filled by rain water or because the dam bed was of a porous nature and water had been lost through seepage.<sup>91</sup> Over the next few years, however, the dams' water levels were reported on in new terms as they increasingly became a new indicator for the extent of water shortages in Ovamboland. Before the dams were constructed the colonial officials' monthly and annual reports referred to water shortages in broad general terms covering large and vaguely defined areas. With the dams, they referred to water shortages in relation to the fullness of specific dams in specific locations.<sup>92</sup> The dams thus provided colonial officials with a new unit of measurement that also allowed a more specific mapping of water shortages in their communications. This performance of measurement and cartographic accuracy was however meaningless to its readers in the central administration and should be seen as more of a ritual of control.

The fullness of the dams varied from year to year, and from dam to dam, as they remained dependent on fluctuating local rainfall and floods to be filled. In years where the dams failed to hold water through the dry season, colonial officials noted that people relied on well-digging and deepening waterholes in order to reach the subsiding water levels in localised aquifers.<sup>93</sup> Wells were able to tap deeper pockets of water in very localised aquifers that were protected from the brak water that limited the depth of large dams. While dams had fixed and limited catchment areas that depended on sporadic rains and floods reaching them directly, waterholes were more mobile and could be dug wherever rains and floods had reached.

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<sup>91</sup> *Ibid.*

<sup>92</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v5, Native Commissioner, NA OV, Ondangua report for February 1932. NAO Monthly and Annual Reports. NAO [018] 11-1v5, Native Commissioner, NA OV, Ondangua report for March 1932.

<sup>93</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v8, Native Commissioner, OV, Ondangua, Monthly Report for March 1935.

While the colonial archive repeatedly mentions the fullness of dams, it tells us little about how dams were used. We are merely told in 1931 that in those that held water during the dry season “considerable herds of cattle were watered daily.”<sup>94</sup> In 1938, we are told, in Oukwanyama people used them for drinking water, and in 1941 that officials at Ondangua used the dam water for their laundry and watering fruit trees.<sup>95</sup> In relation to wells, at a minimum officials reported on the numbers of cattle and people using the water. The silence regarding the use of the dams is rather telling. It suggests that the function of water supply was ignored because it was only considered secondarily in their designs. The dams were presented as a symbol of centralised state authority and modernity, and seen as valuable as such. Where wells established a clear network and correspondence between locals and officials over time, dams denoted distance. They were stamped down by the central authorities of the state as an emergency response and then left to ‘themselves’ on the ground.

In the years following famine-relief dam construction, colonial officials continued to supply tools such as picks, spades and wheelbarrows freely to local elites in order to “improve their water supplies.”<sup>96</sup> These improvements consisted of enlarging and cleaning out existing dams and water holes, and sinking new wells.<sup>97</sup> Only in times of famine in 1939, 1941, 1946 1953 and 1959 did colonial officials directly orchestrate further constructions of dams and

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<sup>94</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v4, Native Commissioner, OV Annual Report for 1931.

<sup>95</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v14, Letter from the Native Commissioner, Ondangua to the Chief Native Commissioner, Windhoek on 14.08.1941.

<sup>96</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v4, Native Commissioner, OV Annual Report for 1932.

<sup>97</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v4, Native Commissioner, OV Annual Report for 1931.

only on a much smaller scale.<sup>98</sup> These later famine-relief works received little attention in colonial reports and were carried out with greater autonomy from the central administration. Through the grain and cash taxes collected as part of the Trust fund system the Ovamboland colonial officials built up grain and cash reserves, which were used on these occasions to implement famine relief work on a smaller scale, without direct funding from the central administration. In Ondonga, famine-relief work was limited to cleaning out dams and waterholes, while in Oukwanyama the work rarely involved dams and focused on the sinking of wells.<sup>99</sup> Over time, the status of excavation dams drew increasingly level with waterholes, as indicated in an official's assessment of the water conditions in Oukwanyama in 1938:

During the rainy season the water supply is from the oshanas and pans but during the dry season it is derived from water holes and from the few dams built during the famine. ... Towards the end of the dry season the water is often so polluted and dirty that no European would dare to drink it and it is not surprising that there is so much dysentery and diarrhoea, especially amongst children, during that time of the year.<sup>100</sup>

There is evidence that the dams built in Oukwanyama may have been responsible for an increased prevalence of malaria in the area. After the heavy April rains and flooding from the Efundja in 1931, there was a malaria epidemic in which over 200 children died.<sup>101</sup> Colonial officials attributed the

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<sup>98</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v12, Native Commissioner, OV, Ondangua, Monthly Report for October and November 1939, NAO Monthly and Annual Reports. NAO [018] 11-1v14, Native Commissioner, OV, Ondangua, Monthly Report for May, June and July 1941.

<sup>99</sup> NAO [010] 5-7-1, Letter from Officer in Charge, Oshikango to the Native Commissioner, Ondangua on 31.12.1938.

<sup>100</sup> *Ibid.*

<sup>101</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v4, Letter from Officer in Charge Oshikango, to Native Commissioner Ondangua on 28.09.1931.

malaria to the location of Oukwanyama being in the northern parts of the oshana system, where the oshana network is much denser and in flood years “is swamped to a greater degree than other tribal areas.”<sup>102</sup> This epidemic occurred immediately after the famine relief dams had been constructed in the oshanas and filled with flood water. The dams would have provided a much larger water surface area than usual, and at more regular intervals, which could have provided more open water for the malaria carrying mosquitoes to breed and spread.

The construction of dams in Ovamboland adopted a more centralised approach than the digging of wells and waterholes. It was initiated by the upper echelons of the state and the dams were designed by a technical official. Colonial officials on the ground however orchestrated and adapted the plans and designs issued by the more central authorities and increasingly gained control of the projects. In his representation of dam construction to his superiors, Hahn performed and flexed his control and order. Centralisation therefore crystallised around these officials on the ground, and as a result, the initial dynamic of a ‘top-down’ infrastructural imposition was dispersed amongst a muddy myriad of actants that these officials relied on and were compelled by.

As with well infrastructure, there was no clean slate upon which dam infrastructure was built. It was necessarily attached to earlier forms of water infrastructure, knowledge and practices. The initial design of the dams replicated features of pre-colonial dams, which were further adapted according to the expertise of local supervisors and workers on the ground. Dams were considered a symbol of modernity, of the state modernising the

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<sup>102</sup> *Ibid.*

native water infrastructure, yet they drew almost entirely from precolonial knowledge. The separation between colonial modernity and native backwardness was utterly undermined in the design of dams. The mode of construction was designed centrally to efficiently employ only 'able-bodied' men with European male supervisors, but was adapted by Hahn to produce a division of labour that equated young 'able-bodied' men with the cash economy of the south, in opposition to women, un-'able-bodied' men and children who were equated with the grain economy of the north, and who were subsequently made to construct the dams in exchange for grain rations. The dynamics of well-digging similarly reflected this division as the 'able-bodied' men employed therefore were paid cash wages.

The construction of dams did not however simply realise the intentions of Hahn. Local elites such as Chiefs, Headmen and Sub-headmen gained political authority and status through participation as supervisors and negotiated for dams to be constructed in their domains of rule. The division of labour envisioned by Hahn was also sanctified by local elites and undermined by women and men who exploited the opportunity to obtain grain without needing to work in the colonial economy. In the actual process of dam construction, the colonial officials were largely absent.

The provision of grain for dam construction work nested it in the local grain economy, and connected it to the production, storage and distribution of grain. The provision of daily grain rations for workers in exchange for labour, and the cash costs involved in transportation, wages and tools, made water infrastructure an object of calculability. Through the Tribal Trust Fund system grain and cash was taxed and stored by colonial officials, who together with local elites, used this capital to finance the continued production of wells and dams in Ovamboland.

## ESTABLISHING THE TRIBAL TRUST FUNDS

There were two fundamental dimensions of water that organised colonial thinking in Ovamboland: fixity and flow. The question of flow connected water to labour and finance. Finance and labour work like water in terms of accumulation and circulation. This connection was not only allegorical, but manifested as an assemblage of infrastructures that connected – and allowed for the flow and circulation of – water, labour, grain and finance. The Trust Fund system was a key part of this assemblage that formed a terminal where these seemingly disparate entities could convene and be translated; where water, labour, grain and finance could flow together and into each other. Like other forms of infrastructure, it had a very material dimension, as it was built on the sediments of land, grain and labour. As a financial infrastructure, the Trust Fund should be seen as a layer covering and connecting the ground layer of the first chapter and the surface layer of this chapter. In this way, it brought wells and dams together and connected them to multiple other concerns.

As with the famine of 1915 when the colonial administration provided famine-relief grain in exchange for Chief Martin's commitment to encourage young men to take up labour contracts in the south, the colonial administration used famine relief to negotiate the introduction of the Tribal Trust Fund tax system with Chief Martin in 1929.<sup>103</sup> It was explicitly stated by the Administrator that he had "impressed upon" the Chief "the necessity of whatever work is done being a success with a view to making the collection of

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<sup>103</sup> NAO, NAO [041] Famine, 34-1 Famine, Letter from the Administrator, Windhoek to Hahn, Officer in Charge, Ovamboland on 13.06.1929.

the trust fund monies easier.”<sup>104</sup> A draft proclamation was immediately drawn up in order to begin collections of 5 shillings per man, and by the end of 1929, 12295 people had been registered and £1010.50 collected in Ondonga, which was immediately put towards the costs of the famine relief scheme.<sup>105</sup> The trust fund scheme was complimented by the introduction of a system for remitting money from migrant workers to their dependents in Ovamboland. Money was remitted through Magistrates in the districts where men were employed, or from the officers at the Luderitz Diamond Mines, and sent to the Recruiting Agent in Ovamboland who in turn paid the cash to the workers dependents, who in turn paid a household tax to colonial officials.<sup>106</sup> Both these systems were later introduced to the other polities in Ovamboland as ‘tribally’ separate Trust Funds.<sup>107</sup> My archive is scant regarding the spread of the Trust Funds to the different ‘tribal’ polities, but it appears to have been implemented almost immediately throughout. Reports in 1929 already mention the Ukuanyama Trust Fund and the Uukwaluudhi Trust Fund, and in 1932 and 1933 reports noted that Trust Fund tools were also being used in Onkolonkathi, Ukuambi and Ongeandjera.<sup>108</sup> Together, the trust fund scheme and the cash remittance system increased the need for cash in Ovamboland and directly linked this increased need to the cash wages earned through

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<sup>104</sup> *Ibid.*

<sup>105</sup> Cooper, “The Institutionalisation of Contract Labour”, 133. NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1929.

<sup>106</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Native Commissioner, OV Annual Report for 1930.

<sup>107</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1929.

<sup>108</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Officer in Charge NA, OV. Monthly report July 1929. NAO Monthly and Annual Reports. NAO [018] 11-1v5, Native Commissioner, OV Annual Report for 1932. NAO Monthly and Annual Reports. NAO [018] 11-1v6, Native Commissioner, OV Monthly Report for June 1933.

migrant labour on the diamond fields, copper and tin mines, road and railway extension works, and farms in the south.

Several historians have shown how colonial rule in SWA attempted to structure two distinct worlds where a traditional native economy would compliment and sustain a modern colonial economy. The Trust Fund system did not merely work to increase the flow of workers to the colonial economy; it was a political technology tasked to simultaneously connect and separate these economies, to produce both sameness and difference. They were connected through a shared currency, which enabled flow by translating different types of work and products into standard monetary units. Furthermore, through the remittance system the delay between those earning wages in the colonial economy and those paying taxes to the Tribal economy was drastically shortened.

One of the functions of the Trust Fund was to differentiate the colonial and tribal worlds by contributing to the production of an insulated and distinctly tribal realm. The Trust Fund organised and defined new parameters of this tribal world in relation to money and grain. It produced and defined a tribal economy with a new currency. The money that provided the same medium to the colonial world was in Ovamboland used to produce a distinctly and emphatically tribal world. This happened partly through what the money was used for, and also through the manner in which money was used. The Trust Fund also taxed grain, which was symbolised as the currency of the imagined Tribal economy and as the product of Tribal labour. Grain and money from the Trust Funds were used to finance the construction of water infrastructure in Ovamboland in a way that colonials hoped would produce a distinctly Tribal world. Like the self-conscious performance of difference produced in Hahn's text to the League of Nations in 1926, which separated the colonial

and the native as binary opposites – this fantasy of a distinctly Tribal Native world and economy was consistently and utterly undermined in the state's actual efforts to produce an infrastructure for indirect rule.

In the 1929 annual report colonial officials indicated that these mechanics of the trust fund system had been realised immediately,

It will be seen that the Ondonga tribe provided the greatest number of recruits this year. This is due to the fact that it is the area where the famine is most severe and able-bodied men who otherwise would not have left the country have been compelled to take up employment in order to earn money to provide for their families. A system of remitting money to the Recruitment Agent, Mr. Cope, as well as to this office was inaugurated towards the middle of this year and many native labourers at Luderitz and elsewhere have taken advantage to send money regularly to their dependents in Ovamboland.<sup>109</sup>

### **THE EBBS AND FLOWS OF LABOUR, MONEY AND GRAINS**

The Trust Fund did not create the interconnection in the flow of finance and labour. Like other forms of infrastructure, it necessarily built on and continued from earlier configurations. Earlier, the German colonial administration had also considered labour and finance as elements that flowed together and in relation to each other. The German officials initially made this connection when they sought to increase the flow of labour out of Ovamboland by reducing the flow of capital/trade into the area. By making the inward flow of finance and goods dependent on the outward flow of labour they were able to assert some influence and control over the labour

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<sup>109</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1929.

supply. They were forced to focus their efforts on the push and pull of flow because they were unable to establish a physical presence in the north having been prohibited by Ovambo authorities. They were thus unable to directly effect labour recruitment on the ground, and relied entirely on the strength of the relation between labour and capital to stimulate the flow.

The concepts of capital and labour were reconciled in the colonial imagination through their representation by the same medium – money. They were conceivable in the same terms; workers time could now be directly calculated and converted into money, which could in turn be converted into purchasable products. Moreover, the rates of these conversions were determined more as parts of a same whole; the economy. Money transported these two seemingly disparate entities of labour and capital onto a consistent conceptual plane, which allowed them to flow together in the colonial imagination. But money did not only exist as an imaginary thing; in a very material form, it also lubricated the flow of labour and capital. Before the migrant labour system was established, trade had largely occurred without money and it was bulky and slow, particularly because the journey through the dry and sandy terrain into Ovamboland was rather taxing on European transport. The goods sought by migrant labourers were later purchased using money they earned for their work on farms, mines and railway construction. Money was less cumbersome and could be used upon returning north. Mostly, however, money was used to buy desired products in the south and transported back north into Ovamboland.

The trust fund system initially demanded taxes be paid only in cash. Of the cash taxes collected in 1930 almost all came from remitted wages.<sup>110</sup> In the

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<sup>110</sup> Hayes, "The 'Famine of the Dams'", 130.

following years however colonial authorities struggled to collect cash taxes, so in 1935 a taxation of grain instead of cash was proposed: "In the meantime a scheme has been devised to impose a taxation in grain instead of cash on the natives in Ovamboland who have not an opportunity of earning money and that those in employment pay their levy in cash."<sup>111</sup> The following year the administration began constructing large grain silos of corrugated iron and concrete, and used 'native style' grain baskets for storage until these had been completed.<sup>112</sup> This Trust Fund grain was sold back to households for cash in times of need, and issued to workers in exchange for famine relief work. With the collection of grain tax, we can see that this infrastructure was built on older practices and modes of irrigation and agriculture. This again shows another layer in the various interconnections that constituted water infrastructure.

With men increasingly absent on one- or two-year contracts in the south, the burden of households' tax increasingly fell on the women who were barred from leaving Ovamboland. Women were burdened with paying cash taxes out of the money remitted by men working in the south, while also having to pay grain taxes, and having to buy back grain for cash when their grain supplies ran low. Official reports however ignored that households were increasingly headed by women, as shown in the in the 1936 annual report: "The statistics reveal that 74% of the male natives in Ovamboland have paid the corn tax and when it is remembered that 20% to 25% of the male adult population is at work in the South this result is excellent."<sup>113</sup> In this way, the

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<sup>111</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v8, Native Commissioner, OV, Ondangua, Annual Report for 1935.

<sup>112</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v9, Native Commissioner, OV, Ondangua, Annual Report for 1936.

<sup>113</sup> *Ibid.*

cash economy was represented as a distinctly male economy and a similarly distorted fantastical statistical world could be imagined.

While the collection of grain was framed by colonial officials as a compromise, it emphasised a particular dimension of the Trust Fund scheme, namely, consistency. Firstly, it showed that tax must continue to be collected, despite the lack of taxable cash in order to maintain consistent form and ritual in the absence of money. This consistency pertains to the idea of circulation, as opposed to stagnation. Secondly, it showed that the state was concerned with managing and regulating the supply of food in order to produce a stable tribal world without fluctuations to disturb the supply of labour. This notion of consistency was informed by seasonality in Ovamboland. Controlling grain supplies was at one level an attempt by the colonial state to flatten the seasonal fluctuations in food supply, which interfered with labour recruitment.

When the Trust Fund was introduced in 1929 seasonality had become an entrenched theme in colonial reports in Ovamboland. The initial accounts written from 1915 to 1920 were first-person observations that overwhelmingly depicted devastation caused by a general lack of water. The effect was to create a state of emergency that demanded immediate intervention. From 1925, the colonial officers stationed in Ovamboland began writing monthly and annual reports for their superiors in Windhoek. The form of regular monthly and annual reports encouraged a tempo and style of reporting that emphasised a picture of patterned change. With reports containing summarised sections on water, cattle and agriculture for the month, this led to a standardised language for briefly accounting for them. The repetition of these terms then in turn became entrenched as the normal colonial concerns in relation to water, cattle and agriculture. With little to actually say about

these topics, colonial officials' reports foregrounded descriptive changes that they and their small network of local informants observed: changes which were anchored around a concept of seasonality. In this way, the repetitive and categorised form of the colonial reports informed their content, bringing the question of seasonal fluctuation to the fore.

The emphasis on monthly changes in water, cattle and agriculture were in turn linked to changes in labour recruitment figures. In the standardised form of reports, labour recruitment figures constituted a distinct section, just like water, cattle and agriculture. Changes in labour recruitment figures were being charted at the same regular monthly intervals as these categories, and explicit connections between them were made. As with water, cattle, and agriculture, labour recruitment was reported on in increasingly standardised terms, however unlike the other categories these terms were statistical. By 1929, colonial officials were able to formulate explanations for labour recruitment figures in terms of their recorded seasonal changes:

Natives, however, appear reluctant to leave their relatives and dependents before they are assured that they will be cared for. I expect to see a lot coming forward for work next month. March has in previous years always shown the biggest totals, but as the rains and season generally are belated it can be taken for granted that the prospective labour recruits will also come forward somewhat later than usual.<sup>114</sup>

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<sup>114</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1929.

## DISRUPTIONS OF TRUST FUND'S FLOWS

The Tribal Trust Fund attempted to demarcate fixed tribal boundaries that demanded a simplified notion of belonging to a single tribe and located those tribes in a fixed territorial space. In so doing, it defined tribal identity in new terms and forced people to rehearse these terms when registering, paying taxes, and sending and receiving funds. I contend that the act of registration was a form of rehearsing tribal identities as defined by colonial officials. The process of working men paying funds in the south and their dependents receiving them in the north was another rehearsal by the state. It was one of the few moments that Ovambo people directly engaged with colonial officials and did so in terms of tribe. The money earned, remitted and paid in tax was processed according to these same Tribal categories.

While colonial authorities reported their surprise at the success of registration and tax payments figures, the registration of households in Ovamboland posed serious difficulties to the administration as the constitution and location of households overflowed and seeped through this rigid yet porous Tribal framework. In 1933 Colonial Officials reported that

the changing of kraals and domiciles is due entirely to the uncertain rainfall as it is the areas where the rainfall has been most inadequate during the last 4 or 5 years which are becoming depopulated. There is no doubt that many of these natives will return when conditions are favourable once more. ... I must point out here that this shifting about or changing of kraals on the part of our natives is throwing the whole Trust Fund registration system out of gear and if it continues it may be necessary to re-register the whole country.<sup>115</sup>

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<sup>115</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v6, Native Commissioner, OV, Ondangua, Monthly Report for October 1933.

The collection of Trust Fund taxes also posed problems to colonial officials on the ground. Trust Fund taxes were collected by individual colonial officials who travelled by car to different polities to make collections of cash and grain.<sup>116</sup> Heavy rains and flooding disrupted Trust Fund collections by making roads impassable, delaying the collections until officials transport could access these areas.<sup>117</sup> At the other extreme poor rainfall and drought also disrupted collections when crops failed.<sup>118</sup> Trust Fund collections were also interrupted in 1943 due to an outbreak of cerebro-spinal-meningitis.<sup>119</sup> In spite of the clear coding of the intention in the design of the system, the practical functioning of the Trust Fund registration system struggled with seasonal shifts and only unsuccessfully sought to flatten them.

The decision-making processes regarding Trust Fund spending is obscure in my archive. Prior to 1961, the colonial reports merely stated that headmen and Chiefs, 'agreed to' or 'suggested' expenditure on certain projects. In 1961, however, a letter suggests that that tribal councils 'voted' to decide how much of tribal trust funds to be allocated to Water Works. In the letter, the Bantu Affairs Commissioner appears to tell the DoW how much Trust Fund money he was allowed to spend on what projects as decided by the different Tribal Councils.<sup>120</sup> For each of the different Tribal Councils, the letter specified

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<sup>116</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v10, Acting Native Commissioner Trollope, OV, Ondangua, Monthly Report for June 1937.

<sup>117</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v10, Native Commissioner, OV, Ondangua, Monthly Report for March 1937.

<sup>118</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v19, Native Commissioner, Ondangua Annual Report for 1947.

<sup>119</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v16, Native Commissioner, OV, Ondangua, Annual Report for 1943.

<sup>120</sup> SWAA. WAT 1921-1970. Ovamboland. Dams General. Storage Unit 145, 146. File no. W.W.81 – 22, Vol. 6, Letter from Sgd. Becker, Bantu Affairs Commissioner,

details such as “The Ukuambi Council have voted an amount of R800 for the erection of causeways at Omapanda (R400) and Onanhuma (R400) on the Main road from Ukuambi to Ongandjera.” And at one point, in a strange representation of the power dynamics, he wrote, “No funds are available to you at all from the Ovambo and Ombalantu Tribal Funds.”<sup>121</sup> At one level, this is an obvious reflection of the position of the Tribal Councils as the authorities who cooperated with colonial officials as the main political institution of indirect rule. But it is interesting to consider the specificity of water infrastructures that the Councils elected to spend funds on. It points to the consistent centrality of the topic of water infrastructure in their relations with colonial authorities. Furthermore, it subverts the earlier relationship where colonial officials decided what was to be constructed and employed natives to construct it. Here, the technical personnel of the state were instructed to construct what the Council decided. Of course, this is more complicated because the technical personnel of the state then in turn employed native subjects on the ground to construct certain infrastructures, but it is precisely this complexity that undermines the received understandings of collaboration and intention.

## FUNDING WATER INFRASTRUCTURE

As a financial infrastructure, the Tribal Trust Fund system should be seen as another layer in the infrastructural palimpsest. The first chapter looked at wells as a sort of ground or base layer, while this chapter viewed excavated dams as more of a surface layer overlapping it. If we picture for a moment

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Ondangua to Department of Water Affairs, ‘Attention Stengel’, Windhoek on 28.06.1961.

<sup>121</sup> *Ibid.*

these layers as a stacked cake, the Tribal Trust Fund should be seen as the icing, covering and connecting those layers.

While introduced initially in relation to dam technology, from the outset in 1929, the Trust Funds were also used to finance the digging of waterholes and wells. The initial £1010.50 collected in Ondonga in 1929 was all used to subsidise the cost of the famine-relief dam scheme in that area, by paying for the importation of corn and tools.<sup>122</sup> Already in 1929, however, Trust Funds in Oukwanyama and Uukwaluudhi were used to purchase tools in order to dig wells and waterholes, and in 1930 the digging of waterholes and wells was officially incorporated as famine-relief work.<sup>123</sup> The dynamics established during the initial famine-relief work on dams, waterholes and wells extended well beyond the initial emergency. In fact, the particular mode of production based on the provision of Trust Fund tools and grain rations for the construction of dams, waterholes and wells continued and steadily became entrenched as the state's standard approach to these particular forms of water infrastructure in Ovamboland.

One characteristic of this mode of production was a new sense of calculability. The emergency costs of famine-relief work in 1929 ushered in the concerns of calculability in relation to the construction of water infrastructure. It made grain rations and cash costs something that needed to be recorded and reported on in relation to dam and well construction. These costs were from the outset met from the Trust Funds and calculated as such. The planning and construction of water infrastructure from then on was calculated according to

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<sup>122</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1929.

<sup>123</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Officer in Charge NA, OV. Monthly report July 1929. NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Annual Report for 1929.

Trust Fund grain and money. These quantified calculations further connected labour, water, money and grain, and allowed them to be thought of on the same conceptual plane. In the colonial imagination it made them relatable as quantifiable proportions.

After the official famine-relief work ended, the officials reported in 1932 that Trust Fund tools such as picks, spades and wheelbarrows were being “freely distributed to any natives desirous of improving their water supplies.”<sup>124</sup> In 1933, they celebrated that in relation to the digging of wells and waterholes, “never before has there been such activity as is taking place throughout Ovamboland”, and that “nearly all the trust fund picks, spades, and shovels have been handed out on loan to responsible natives.”<sup>125</sup> The ownership and control of these tools was described quite ambiguously by officials. They were paid for by distinct Tribal Trust Funds, which in the beginning at least appeared quite an informal procedure, reported in 1929 simply as Chief Muala ‘handing’ £50 to the Officer in Charge “for which he desired to purchase spades, picks, etc., with which to commence work on waterholes.”<sup>126</sup> But tools were variably described as being ‘distributed’, ‘supplied’ or ‘loaned’ to natives by colonial officials in their reports up to the 1940s, which implies they were held and controlled by officials. Despite this, the distribution of these tools allowed for greater independence from the colonial officials in regard to the construction of wells and waterholes, and were conducive to the spread of a different type of well that required picks, pulleys and steel buckets. While the digging of waterholes and wells using Trust Fund tools in

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<sup>124</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v5, Native Commissioner, OV Annual Report for 1932.

<sup>125</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v6, Native Commissioner, OV Monthly Report for June 1933.

<sup>126</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v2, Officer in Charge NA, OV. Officer in Charge NA, OV. Monthly Report for July 1929.

most parts of Ovamboland occurred quite independently of colonial officials, in eastern Ovamboland large-scale expeditions to dig wells and waterholes were still conducted at the behest of colonial officials.

The continued work on excavated dams similarly remained dependent on colonial officials. With the structure of famine-relief work entrenched between 1929 and 1932, and the continued availability of Trust Fund tools and funds, colonial officials were more easily able to instigate famine-relief work after 1932. Already in 1933, due to proclaimed food shortages, the colonial officials “put to work relief workers” in clearing out the silt from the empty dams.<sup>127</sup> This was done without real consultation or coordination with the central authorities that had been directive of previous such work. With the establishment of the Tribal Trust Fund taxation and storage of grain in 1935, colonial officials on the ground had access to large supplies of grain without needing to import it, which granted them more autonomy from the central state. With the availability of these grain supplies, the distribution of Trust Fund grain to workers became a standard feature in the construction of dams, wells and waterholes that were initiated by colonial officials on the ground. Relief work on dams – which fluctuated between cleaning them out, expanding them, and constructing new dams – in 1939, 1941, 1946, 1953 and 1959 all continued to provide grain to workers. While the large scale well-digging expeditions in the east in 1935, 1939, 1941, 1942, 1946, 1949, 1953 and 1959 also provided grain rations for workers. It is clear that the distribution of grain originally designed as a feature specifically of famine-relief work, became a standard procedure in the construction of excavation dams and wells. The archive remains relatively silent on the severity of the food-shortages that were proclaimed as the reason for the construction of the dams

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<sup>127</sup> NAO Monthly and Annual Reports. NAO [018] 11-1v6, Native Commissioner, OV, Ondangua, Monthly Report for October 1933.

in this period. It is also unclear as to whether all the dams orchestrated by the officials on the ground were purportedly related to food-shortages. However, it is abundantly clear that wells orchestrated by officials were not constructed simply as a form of famine-relief work.

Beyond tools and grain, the Trust Funds were also used to pay well-diggers in the east cash wages starting in 1939.<sup>128</sup> When colonial officials grew disillusioned with the results of well-digging in the east in 1947, and therefore privately contracted borehole drilling in the far east and west, they decided that the tribes that would benefit from the boreholes should be made to pay part of the boring costs out of their Trust Funds. They reported the credit balances of each Tribal Trust Fund as: Uukwaludhi £1,500, Ongandjera £2,000, Ovambo £150, Oukwanyama £15,250, Ondonga £14,600, and decided that they should be made to pay proportionate amounts.<sup>129</sup> This corresponded to £100 for Uukwaludhi and Ongandjera, £25 for 'Ovambo', and £1,000 for Oukwanyama and Ondonga.<sup>130</sup> While most of these boreholes failed, those that were considered successful had pumping plants erected, which were also paid for by Tribal Trust Funds.<sup>131</sup>

In relation to dams, workers continued to work only for grain rations, but Trust Funds were used to pay for private contractors with heavy machinery starting in 1947.<sup>132</sup> For instance in 1954 £4,000 was paid by the Ondonga Tribal

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<sup>128</sup> NAO [010] 5-7-1, Letter from Officer in Charge, Oshikango to the Native Commissioner, Ondangua on 31.12.1938.

<sup>129</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Allen, the Assistant Secretary to the Chief Native Commissioner on 27.11.1947.

<sup>130</sup> *Ibid.*

<sup>131</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Native commissioner of Ovamboland, Ondangua to Chief Native Commissioner, Windhoek on 01.08.1953.

<sup>132</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Allen, the Assistant Secretary to the Chief Native Commissioner on 27.11.1947.

Trust fund to pay for causeway dams and excavation dams built between Ondangua and Oshikango by private contractors, while £5,000 was paid by the Oukwanyama Tribal trust fund for the construction of 7 excavation dams by private contractors.<sup>133</sup> Reports also indicated that dams constructed by private contractors throughout Ovamboland in 1958 were partially paid for by the Uukwambi, Uukwaludhi, Ombalantu, Oukwanyama and Ondonga Tribal Trust Funds.<sup>134</sup> The Tribal Trust funds were also used to purchase a bulldozer in 1961, which was used for dam construction.<sup>135</sup> From 1947, cash from Trust Funds was being used for the construction of new forms of water infrastructure that was built by private contractors using heavy machinery, and was planned and designed by central technical experts. The cash from Trust Funds therefore tied together a broader regime of water infrastructure, which included boreholes, pumps, bulldozers, and private contractors. At the same time, it continued to subsidize well-digging in the east and provide the grain used to build and maintain dams.

In a way, it seems that the Tribal Trust Funds were simply used to subsidize the costs of colonial administrations activities in general. But upon closer inspection a pattern emerges. A pattern between an array of different actants, both visible and invisible, intentional and unintentional. In this pattern, there is a logic at play. The link between water, agriculture, cattle, and labour as discerned through colonial reporting, formed the imaginary object of seasonal fluctuation that the Tribal Trust Fund worked to transform. First and foremost, the Trust Funds were used to construct a water infrastructure in

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<sup>133</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from the Secretary to the Honourable the Administrator-in-Executive Committee on 10.02.1954.

<sup>134</sup> SWAA. WAT 1921-1970. Ovamboland. Damse General. Storage Unit 145, 146. File no. W.W.81 – 22. Letter from Director of Works to Chief Native Commissioner on 11.02.1958.

<sup>135</sup> Kreike, “Architects of Nature”, 186.

Ovamboland that would tame seasonal fluctuations and discipline disruptions.

As a financial infrastructure, the Trust Fund system traversed and connected the colonial monetary economy of the south, and the agricultural 'tribal' economy of Ovamboland. It did so epistemologically by providing a consistent conceptual plane where disparate entities such as labour, water, grain and money could be translated and conceived of in relation to each other. It also connected them in a material way by taxing both grain and cash, derived from male migratory labour and female agricultural labour respectively – a separation implemented and sanctified by the state, in part through the famine-relief work on dams and wells started in 1929. This cash and grain capital was in turn used to pay for the construction of a water infrastructure consisting of dams and wells that had been instigated originally as a form of famine-relief in 1929. From 1947 Trust Fund cash was also used to pay private contractors to sink boreholes with pumps and to use heavy machinery to construct larger dams. In this way this overarching financial infrastructure straddled the different and seemingly separate infrastructural regimes. The ideal overarching function of this water infrastructure was to flatten and tame seasonal fluctuations that effected human and cattle movements, cattle grazing and agricultural production. The idea was to 'fix' the Ovamboland economy, in order to be able to control the 'flow' of male labourers south. This arrangement, however, performed many functions beyond what the colonial authorities envisioned and intended, and in the course of its coming into being, it produced multiple effects that could not be easily pigeonholed into a straightforward narrative of oppression and resistance.

In attempting to flatten seasonal fluctuations and their attendant disruptions, Trust Fund infrastructure and water infrastructure necessarily ‘plugged into’ and built on older regimes that concerned human and cattle migration, cattle grazing, crop production and storage. These chapters have tried to elucidate how they were shaped by these regimes. Colonial intentions were forced to contend with an existing world, which was messy and relentlessly muddied their intentions. They were forced to work with the intentions of local actors and to adapt to the particular materialities and infrastructures at play. Due to their extensive limitations, colonial officials had to ‘make do’.

By following this infrastructure in such a thick description, it has become apparent that any attempt to understand what happened in terms that are presented too coherently and cleanly will necessarily be overwhelmed and subverted. There are always more connections and entanglements. There is no contained clean white-washed room in which to present this history. Despite this messiness, there are tendencies and patterns – ‘logics’ at play – and I have attempted to discern some of these.

## CONCLUSION

While the first chapter dealt with a layer of infrastructure deeper under the ground, this chapter looked at a layer closer to the surface. In the first instance, the wells and boreholes of the first chapter dug down deeper into the ground than the dams. The dams did not only dig down, but were built up slightly too, which provides a metaphor for the increasing influence and confidence of the colonial state in Ovamboland. The dams had a raised bank around them, which attempted not only to capture an already existing flow, but to effect and redirect that flow.

The first chapter demonstrated how well-digging relied on indigenous knowledge and expertise. This chapter also explored the entanglements between colonial and native knowledge, expertise and practices; however, with the official focus beginning to shift to dams, more centralised calculations came to overwhelm such local entanglements. In relation to dams, colonial officials on the ground took greater initiative and had more influence. They became responsible for dam construction quite autonomously of the centralised state. They formed a middle stratum between the high central state and the Ovambo inhabitants on the ground. In this middle layer of dams, a modernist expression of the colonial state began to be realised and stamped onto the landscape.

The Tribal Trust Fund formed yet another layer – the icing on the infrastructural cake. It covered and connected dam and well infrastructure and drew them into a more formalised relationship with grain, finance, cattle and labour. This layer of financial infrastructure that was so materially entangled with water infrastructure, carries on into the next chapter, where we explore how big money was spent to construct a big water infrastructure. In this section, I have already alluded to some events that belong to the period more fully considered in the next chapter – that is a symptom of the palimpsestic nature of infrastructure. The dialectic of flow and fixity remains central to any understanding of this palimpsestic history.

## **No Leakage?:**

### **Infrastructural Conceits of a Weak Leviathan**

From 1946, there was a discernible shift in the colonial discourse around water, which was mirrored by shifts in representations of the state and the ways in which it dealt with water. The Apartheid state represented itself as a novel break from the earlier colonial state, and sought to produce a new corresponding material world. The clean separation from the past presented by the Apartheid state however did not transpire in the material infrastructure of Ovamboland, which continued to build on and be shaped by the sediments of old. Older water infrastructures, and the techniques, knowledge and social configurations that comprised them, continued into this era, thus undermining the conception of the distinctness of an era as defined by political representation.

The shift in the identity of the state is also reflective of my archive, where the regular detailed minutiae, communications and reports of officials on the ground were replaced by occasional and lengthy official publications by the

Water Affairs Department. These publications foregrounded such water infrastructures that were part of the administrations grandiose plans for transforming and developing Ovamboland, namely hydro-electric power plants, large dams, canals and boreholes. Water infrastructures like wells, excavated dams and waterholes that were constructed by locals, and involved the participation of local officials on the ground to varying degrees, were largely silenced and ignored. Despite the silences of the archive in relation to these older infrastructural regimes, the 'new' water infrastructure celebrated in the archive was necessarily nested in the old, and in many ways continued to reproduce the old. The new imagination of the state that is connected to this seemingly new infrastructure, however also continues to imagine the problem of water in Ovamboland in similar ways as before. Some of these continuities are discernible as traces in the archive, while others are noticeable by their glaring omission.

Following these changes and continuities in water infrastructure undermines the purported distinctiveness of the Apartheid state and its claim to a new era, but at the same it time reveals a significant shift in terms of the infrastructure itself. The introduction of canal and hydro-electric infrastructure inverted the logic distilled by the prior regime of water infrastructure and consequently forced their recalibration. Rather than a developmental policy from the centre simply determining changes in the water infrastructure, there was a dialectical relationship, where the water infrastructure in turn had an impact on the contents of developmental policy. The abundance of energy in the form of water and electricity provided by the canals and hydro-electric generators, excited managerial imaginations of government officials and led to calculated planning of a total economy for the area. Underneath these neat and tidy calculations, however, water infrastructure and all the various elements it connected – water, sand, cattle,

labour, money, grain, electricity, knowledge – remained thrown together in a messy entanglement that far exceeded the state's capacity to control, understand or plan.

The strictly rational and scientifically calculated and controlled character of the state as represented through its own publications, is found to be at odds with an archive of letters and internal communications related to water divining in the same period. In 1961, one of the highest authorities of the state, the Administrator in Executive Committee, requested that the technocratic officials of the Water Affairs Department take seriously and test the capacities of a water-diviner. Like a headache the irrational resurfaces in the state, despite having previously dismissed it.

#### **THE 1946 REFERENDUM AND DEVELOPMENT**

In 1946 colonial officials carried out a controversial referendum amongst the 'native' population to show that the 'natives' were in favour of SWA being incorporated into the Union of South Africa.<sup>1</sup> The vast majority of the referendums 'native population' resided in Ovamboland and their 'native' official representatives allegedly elected to be incorporated into the Union. In making the case for incorporation, Hahn, the Native Commissioner of Ovamboland, accompanied Smuts at the UN Conference in New York in 1946 to advise on the 'treatment of natives' in the territory.<sup>2</sup> The proposal for incorporation was rejected by the United Nations and SWA was placed under the UN Trusteeship Council, but the following year the South African

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<sup>1</sup> Allan Cooper, *Ovambo Politics in the Twentieth Century* (Lanham, MD: University Press of America, 2001), 209.

<sup>2</sup> Hayes, "'Cocky' Hahn and the 'Black Venus'", 2.

government informed the UN that it did not recognise the status of UN Trusteeship and would continue to administer SWA as a mandate.<sup>3</sup> Over the next two decades the disputed status and sovereignty of SWA produced an ongoing spectacle on the global stage of the UN. In this spectacle, SWA – and Ovamboland in particular – was presented and discussed in terms of ‘development’ and ‘progress’, both to condemn and defend South Africa’s position. The production of a spectacle of development and progress of the ‘native’ population therefore became an increasingly important agenda for the SWA colonial state. Until 1949 South Africa directly submitted reports to the UN extolling their developmental achievements in SWA, but the production of a spectacle of development did not end with cessation of their reports to the UN.<sup>4</sup> Development was performed not only for a global audience, but also as an act of self-assurance to the burgeoning ideology of Apartheid and separate development. With the National Party elected to power in South Africa in 1948 and in SWA in 1950, apartheid was implemented and the policy of separate development soon followed.<sup>5</sup>

From 1947, this rhetoric of ‘development’ became increasingly prevalent in relation to water in Ovamboland. By 1968, the Water Affairs’ official Ovamboland Master Water Plan was centred on the concept of development, which had taken on a strong economic association:

The ultimate development of Ovamboland to a self-supporting economy is dependent on many factors but the provision of water services in sufficient quantity and security is of paramount

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<sup>3</sup> Cooper, *Ovambo Politics*, 209.

<sup>4</sup> <http://www.klausdierks.com/Chronology/95.htm>, visited on 23.06.2019

<sup>5</sup> *Ibid.*

importance. Dependable supplies are the only means of bringing about production on a sustained basis in all sectors of the economy.<sup>6</sup>

While the semantic force of the concept of 'development' evolved over time and varied between contexts, the word continued to define the colonial state's approach to water in Ovamboland from 1947 to 1968.

### **A WATER POLICY FOR OVAMBOLAND: MARTIN'S REPORT**

In relation to 'development', a new approach to water infrastructure can be distinguished from 1947, when the problem of water in Ovamboland increasingly became a concern of the upper echelons of the central administration of SWA, and was made contingent on the establishment of a policy regarding the development of 'native' areas. This was expressed clearly by the Secretary for SWA in a letter to the Native Commissioner in March 1947, in which he responded to requests for improved roads and water infrastructure for Ovamboland thusly: "We can do, as it were, odd jobs but the plain fact is that if we seriously mean to carry out a long range development programme we must first organise for it, otherwise we merely delude ourselves."<sup>7</sup> He laid out two fundamental issues that needed to be decided before undertaking any infrastructural work: "What is our policy – do we really intend to develop the Reserves faster than the natives unaided can do? We must ask the Advisory Council to recommend some definite objective."<sup>8</sup> And secondly,

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<sup>6</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 74.

<sup>7</sup> SWAA. Ovamboland – Water Supply. 1920-1951. Vol. 3, Letter from Slater, Secretary for SWA, Windhoek to the Native Commissioner, Windhoek on 08.03.1947.

<sup>8</sup> *Ibid.*

the question of capital funds. The existing Trust Funds are mere chicken feed for any serious development. Our attempt to secure some assistance from the fund of the Custodian of Energy Property is not likely to meet with success in the immediate future. My view is that we should now consider an appropriation from our own revenue for non-European development of a capital nature.<sup>9</sup>

The Secretary for SWA also linked water infrastructure to other areas of development: “Hand in hand must go a progressive policy in respect of health, education and field and animal husbandry development, not to mention housing in urban areas”.<sup>10</sup> Under the concept of development, water was grouped with concerns of industrial development, health, sanitation, education, population management, town planning, large-scale agriculture, and urban housing.

From 1947, water in Ovamboland became an object of development that needed to be carefully planned by the upper echelons of the state in relation to a broader policy of ‘native’ development. As such, it became a national question that warranted financing from state revenue on a much larger scale. Water infrastructure was considered a key aspect of development in and of itself, but it was also considered necessary for the provision of these other developmental concerns. The planning and design of water infrastructure in Ovamboland therefore had to be coordinated with these other projects and demanded a much more centralised planning.

The infrastructural content of this developmental approach to water in Ovamboland was initially informed by a report by Dr H Martin in 1947 soon

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<sup>9</sup> *Ibid.*

<sup>10</sup> *Ibid.*

after he became the head of the SWA branch of the Geological Survey of South Africa.<sup>11</sup> His report was initially carried out in response to a request from the new Ondangua Native Commissioner Harold Eedes, to explore boring possibilities for a new government station and more generally to “know the potentialities of the water supplies of this territory, so as to be in a position to prevent the further overstocking and overpopulating of the present inhabited areas.”<sup>12</sup> Considering the scope of the report and the effect it had on shaping the colonial state’s decisions and policies regarding water in Ovamboland, it is interesting that the instructions from the Secretary for SWA to the Director of Works emphasised that the

immediate object of the mission should be to investigate the provision of adequate water for the Native Affairs headquarters in Ovamboland but the wider issue can also have attention according to the length of time you are able to allow the geologist to spend in Ovamboland this season.<sup>13</sup>

Martin’s report was the most in-depth and extensive account of water in Ovamboland that the colonial state had hitherto produced. It provided analyses of the topography, geology, groundwater, existing water supplies, and different types of vegetation that indicated different types of underground formations over the whole area of Ovamboland. The report also recommended possibilities for groundwater infrastructure development, which were separated into three zones based on their underlying strata: western, central and eastern Ovamboland. Despite his focus on underground

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<sup>11</sup> G. Schneider, “The History of the Geological Survey of Namibia”, *Communications of the Geological Survey of Namibia*, No. 12 (2000), 1.

<sup>12</sup> SWAA. Ovamboland – Water Supply. 1920-1951. Vol. 3, Letter from the N.C, Ondangua Eedes to Chief Native Commissioner, Windhoek on 17.02.1947.

<sup>13</sup> SWAA. Ovamboland – Water Supply. 1920-1951. Vol. 3, Letter from Slater, Secretary for SWA, Windhoek to the Director of Works, Windhoek, Forwarded to The Native Commissioner, Ondangua on 16.04.1947.

water and his recommendation that in all three areas exploratory boreholes be drilled to different depths, he claimed that excavation dams had been the only useful infrastructural addition to old 'sandholes' and that excavation dams and excavated sand-filled storage systems should constitute the main water supply in the future.<sup>14</sup> Ultimately, the report called for a coordinated and adaptive infrastructural approach to the question of water in Ovamboland that would interact as an integrated network over the whole area.

Martin's report echoed previous investigative reports produced by state experts. In the first instance, these reports were all regarded as being scientifically conclusive and as having revealed the facts for the first time. Each of these reports separated the area into territories corresponding to ground types and underground water conditions. They all studied indigenous water infrastructure and were impressed by the efficiency of indigenous water infrastructure. They all similarly recommended an approach that adapted and adopted pre-existing techniques and knowledge to these separate areas.

Martin's report percolated through the Director of Works, the Chief Native Commissioner and the Secretary for SWA before reaching the Administrator-in-Advisory Council in the form of a proposal that sought to establish some organisation and policy regarding water in Ovamboland and requested an initial budget of £15 000 for the proposed work.<sup>15</sup> The proposal outlined "the

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<sup>14</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Report from Dr. H. Martin to Director of Works on 05.11.1947.

<sup>15</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from the Wipplinger, Director of Works, Windhoek to the Secretary for SWA, Windhoek on 22.11.1947, SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Allen, the Assistant Secretary to the Chief Native Commissioner on 27.11.1947, SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from the Secretary to the Administrator-In-Advisory Council on 17.12.1947.

four-fold problem of water in Ovamboland": 1) In the central populated Oshana area to assist natives to conserve and increase water supplies. 2) To explore and find water in dry areas in the east in order to extend native settlements and in the far west to establish a new administrative station. 3) To find supplies of water for development in the sense of hospitals, clinics, schools and hostels. 4) To provide adequate water supplies for officials stationed in Ovamboland.<sup>16</sup> This was the first articulation of a water policy for the whole of Ovamboland. For the first time, state funds were allocated for several connected water projects together rather than a single project to solve a specified problem. All but the third of these were old concerns of the state, but for the first time these varied aspects of water were tied together under a water policy with a shared and distinct pool of funds.

In this period the governmental structures in SWA and Ovamboland underwent significant changes. At the end of 1946 the Native Commissioner Carl Cocky Hahn was replaced by Harold Eedes. Hahn was known for administering Ovamboland as his own fiefdom, having ruled the area as the highest colonial authority since 1920.<sup>17</sup> With Eedes's appointment the administration attempted to increasingly centralise and formalise local governmental institutions and their relations to the colonial administration. The administration sought to incorporate local authorities more closely by forming a General Council of Chiefs and Headmen for Ovamboland and codifying all the local laws and customs.<sup>18</sup> After 1946, the administration also reduced the autonomy of the Ovamboland colonial officials, with the central administration, and particularly the Native Affairs department, taking on more responsibility for the governance of Ovamboland. In 1948, the National

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<sup>16</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from the Secretary to the Administrator-In-Advisory Council on 17.12.1947

<sup>17</sup> Hayes, "'Cocky' Hahn and the 'Black Venus'", 2.

<sup>18</sup> Cooper, *Ovambo Politics*, 236-237.

Party came to power in the Union of South Africa and in 1953 Ovamboland was transferred to Native Affairs Department of the Union of South Africa.<sup>19</sup> From 1946, the government of Ovamboland transitioned from a more autonomous system of indirect rule established under Hahn to a more formalised and centralised system of direct rule administered by a more centralised Native Affairs department according to national policies of apartheid and separate development.

This shift in government saw similar shifts in the state departments responsible for water in Ovamboland becoming increasingly centralised and technocratic. From 1947 to 1954, the construction of water infrastructure in Ovamboland was largely initiated and decided amongst the Tribal Councils, the Native Commissioner, the Chief Native Commissioner and Secretary for SWA and then carried out by the Department of Works. In 1954 the Department of Water Affairs was established in SWA and H.W. Stengel was put in charge of water development in Ovamboland, having worked for the Department of Works since 1947.<sup>20</sup> With the establishment of the Water Affairs Department, the amount of available staff, resources and funding for water infrastructure in Ovamboland increased staggeringly. The establishment of the Water Affairs Department was represented as a new era for water infrastructure in Ovamboland, as the 1968 Masterplan triumphantly stated, "[i]n 1954 intensive development of water supplies was started."<sup>21</sup>

The Water Affairs Department was responsible less for the actual construction of water infrastructures, focused more on planning and designing projects on

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<sup>19</sup> Kreike, "Architects of Nature", 275.

<sup>20</sup> Brigitte Lau and Christel Stern, *Namibian Water Resources and their Management: A Preliminary History*, (Windhoek: National Archives of Namibia, 1990), 2.

<sup>21</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 35.

a much larger scale that stretched over longer periods. Designs for water infrastructure involved meticulous drawings with precise measurements and calculations, carefully mapping them in relation to relevant local environmental features like *iishana*, pans and vegetation. Because these infrastructures were concerned with local surface water, their designs also mapped and calculated the changing gradients across the landscape. Wells, cisterns and boreholes, which were dependent on ground water, were not planned and designed as thoroughly and were largely ignored in Water Affairs publications, considered as additions to the central interconnected surface water system. The particulars of their construction were largely left to the expertise of the people employed to construct them, more independent of the developing interconnected water infrastructure. With greater funding available, the Water Affairs Department increasingly employed private contractors to carry out the construction of all these types of water infrastructure in Ovamboland. What is not visible in this archive of official publications and technical reports is that much of this water infrastructure continued to be constructed by Ovambo people. Famine-relief work on dams, waterholes and wells continued throughout this period, while private contractors employed Ovambo workers in a variety of roles including driving trucks and heavy digging machinery.

#### SHIFTS AND CONTINUITIES IN WATER INFRASTRUCTURE

Martin's report in 1947 claimed that excavation dams had been the only useful infrastructural addition to old 'sandholes' and that excavation dams and excavated sand-filled storage systems should constitute the main water

supply in the future.<sup>22</sup> The report noted that the drawbacks of the existing excavation dams were that they

cannot be made deep enough, to hold water for more than one season, because the water becomes brackish as soon as the calcrete on top of the sandstone is penetrated. ... The second difficulty is the fact that open water in small dams has not the self-cleaning properties existing in large dams, so that the water becomes progressively more unhealthy and foul.<sup>23</sup>

In order to address these problems, Martin recommended the construction of 'sandfilled excavation systems', where a starshaped system of trenches sloping slightly towards the centre should be excavated and the centre was to be occupied by a concrete well with sand strainers, and then the whole system was to be filled with loose sand heaped over the trenches. He expected that this design would keep the water clean and reduced evaporation.<sup>24</sup> The report concluded that "it is unlikely that a simple solution, like just sinking boreholes, will be successful in the greater parts of Ovamboland. Therefore, such schemes adapted to the very special conditions of the area must be envisaged."<sup>25</sup>

The design of the 'sandfilled excavation system' actually resembled quite closely the way certain traditional water hole infrastructure worked. Traditional water holes and wells were ideally situated at the centre of a conical impervious clay lens lying below it, where the sides gradually inclined towards it. In this way the water in the waterhole would refill slowly by

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<sup>22</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Report from Dr. H. Martin to Director of Works on 05.11.1947.

<sup>23</sup> *Ibid.*

<sup>24</sup> *Ibid.*

<sup>25</sup> *Ibid.*

underground water slowly flowing down the gradient of the impervious clay layer and infiltrating into it. This process was described by a European visitor in 1895-1896:

[it] is a funnel-shaped depression about 50 meters in diameter, in the middle of which there are two holes about one meter in diameter that human hands have deepened to wells. At the bottom of these the water of the lower layers of the surrounding sand-veld, which sinks down and is stored after each rain, gathers. In order to water all the oxen six of my men had to stand the one above the other on steps in the well and haul up the water in buckets....before they all had had enough to drink the well was empty and we had to let the water run in during the night.<sup>26</sup>

The design of the 'sand filled excavation' replicated this central mechanism, recognising that evaporation would be minimised and the water would be kept clean. To what extent this replication was deliberate is however not made visible in the official archive. In the first chapter I showed how state experts' earlier reports appeared to draw from indigenous technologies without acknowledging them. The technological similarity here suggests a conscious replication, while the evidence of the same in earlier reports also hints that this report continued in that trend.

Although Martin's idea of 'sandfilled excavation systems' was never implemented, his notion of adapting and integrating different types of water infrastructure was experimented with. In 1949 the Department of Works carried out hand-drilling explorations in *omurambas* in the central area in order to construct excavated dams with auxiliary wells in which the dams'

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<sup>26</sup> Peter August Möller, *Journey in Africa through Angola, Ovampoland and Damaraland* (1899; rep. Cape Town: C. Struik, 1974), quoted in Kreike, *Architects of Nature*, 222.

water could be more effectively stored.<sup>27</sup> In 1950, the Department of Works developed this idea by constructing a much larger excavation dam near an old smaller excavation dam in Ondangua with a windmill pump to move water from the smaller one to the larger one.<sup>28</sup> In that same year, they also constructed the first road causeway dam, whereby a raised road constructed through an *oshana* acted as a raised bank for an excavated dam beside it allowing for 3 feet of water to be stored above the *oshana* bed and 9 feet below it.<sup>29</sup> This causeway dam design was proliferated in 1953 when the Department of Works planned to construct an 'all-weather road' from Ondangua to Oshikango with nine such causeway dams along it.<sup>30</sup> Through these experiments the Department of Works integrated various older established technologies in an attempted to improve the efficiency of dam infrastructure according to two main functions: water capture and storage.

Martin's recommendation for boring explorations was also taken up and, starting in 1948, explorative boreholes were sunk in the western, central and eastern parts of Ovamboland by boring contractors.<sup>31</sup> The boreholes in central Ovamboland failed, but in the west near Tshandi two of the three holes sunk were successful and were fitted with pumping plants.<sup>32</sup> In 1952, boreholes had

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<sup>27</sup> NAO [101] Scientific Research OV, 43-3 Water Supply, Letter from the Director of Works, Windhoek to the Chief Native Commissioner, Windhoek on 25.08.1949.

<sup>28</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Director of Works, Wipplinger to Chief Native Commissioner, Windhoek on 30.08.1950.

<sup>29</sup> NAO [101] Scientific Research OV, 43-3 Water Supply, Letter from Director of Works, Windhoek to Chief Native Commissioner, Windhoek on 30.08.1950.

<sup>30</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from the Secretary to the Honourable the Administrator-in-Executive Committee on 10.02.1954.

<sup>31</sup> SWAA. WAT 1921-1970. Ovamboland. Boring. Storage Unit 149. File no. W.W.81 – 22 – 1, vol.1, Report from Martin to Director of Works on 09.11.1948.

<sup>32</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from Director of Works, Windhoek to the Native Commissioner, Ovamboland on 25.08.1949. SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter

failed in the south-eastern area, but five successful boreholes were sunk in the north-eastern area and equipped with pumps, engines and cement-brick reservoirs with drinking troughs.<sup>33</sup> These boreholes and pumps were not a new development either; in fact, they were paid for by the Tribal Trust Funds and were seen as a direct replacement of well-digging. Boring contractors faced innumerable problems in the east due to the fine nature of the sand and the boring was stopped in 1953. The fine sand provided low yields, it caused boreholes to collapse before they could reach the deep water table. It also caused cylinder-trouble for the pumps, and blocked the filters.<sup>34</sup> While few successful boreholes were sunk in these explorations, the Department of Works established that boreholes could only be successful in the eastern and western reaches of Ovamboland, and that the central area would have to rely on surface water. The official publications and communications, however, neglected to mention that after boreholes failed in east in 1953, well-digging was taken up again according to the older modes established in 1929.<sup>35</sup> As with the earliest investigations into, and attempts at, boring, the ground was categorised into two different types and the area territorialised into three sections that corresponded to those types. This territorialisation fundamentally characterised the plans for the future water infrastructure, and subsequently shaped the plans for developmental facilities and institutions that depended on particular water infrastructures.

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from Native commissioner of Ovamboland, Ondangua to Chief Native Commissioner, Windhoek on 01.08.1953.

<sup>33</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from W.H. Olivier, the Assistant Native Commissioner, Oshikango to the Native Commissioner, Ondangua on 31.08.1953. NAMLIT, Water Supply in Ovamboland 1961, 4.

<sup>34</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from W.H. Olivier, the Assistant Native Commissioner, Oshikango to the Native Commissioner, Ondangua on 31.08.1953. SWAA. WAT 1921-1970. Ovamboland. Boring. Storage Unit 149. File no. W.W.81 – 22 – 1, Vol.1, Letter from H. Martin, Chief Geologist, Directorate of Works to the Director of Works on 25.03.1953.

<sup>35</sup> Kreike, *Re-creating Eden*, 153.

Based on the calculated prevalence and durations of droughts in Ovamboland, the administration's designs for dam storage aimed to provide an increased capacity that would supply water for at least two consecutive years.<sup>36</sup> This increased storage capacity was to be achieved through the construction of causeway dams, larger excavation dams and pump-storage dams, which were to be constructed on a much larger scale. In 1954, the Water Affairs Department began large-scale construction of dams and, by 1968, had constructed more than 300 of them, with a total accumulated storage of about 7,000,000m<sup>3</sup>.<sup>37</sup>

### EXCAVATION DAMS

As with earlier excavation dams in Ovamboland, the dimensions of those constructed in Ovamboland after 1947 were still constrained by the shallow saline water table which varied from 2m to 5m.<sup>38</sup> These dams however were no longer solely constructed by Ovambo workers using picks, shovels and baskets. Instead, with the use of heavy machinery their capacity was increased from around 10,000m<sup>3</sup> to 20,000-30,000m<sup>3</sup>.<sup>39</sup> Their side slopes were usually 1:2 or 1:3 depending on the soil type and were fenced off to prevent cattle trampling the sides. Where they did not have fencing their slopes were 1:6 to allow cattle to drink without damaging the sides. In the 1950s some excavation dams were fitted with sand-filters leading to a well with a hand-pump to allow humans to use them for drinking water, but most were used

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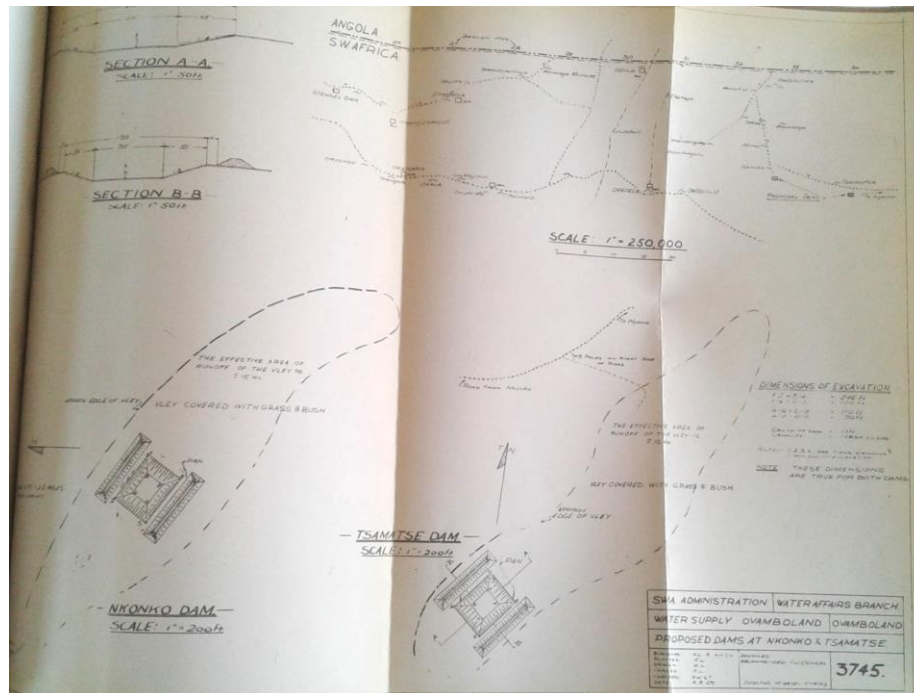
<sup>36</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 36.

<sup>37</sup> *Ibid.*

<sup>38</sup> *Ibid.*

<sup>39</sup> *Ibid*, 35.

for watering cattle. These early sand-filters at these dams often failed due to the fine nature of the local sand available and so coarser sand was later imported from Ruacana.<sup>40</sup> These excavation dams were carefully designed by Water Affairs experts with precise drawings noting the particular circumstances of their location in *iishana* and adjacent infrastructure such as roads, buildings and wells [Image 18].

Image 18<sup>41</sup>

These larger excavation dams retained the same basic design as earlier excavation dams, being open on at least one side to the local *oshana* in order to capture flood water.<sup>42</sup> Unlike previous excavation dams that were located mainly according to where colonial officials deemed famine relief was most needed, in this phase excavation dams were located more according to where it was deemed humans and cattle most needed them, and where they would most effectively capture and store water. Unfortunately, the nature of the

<sup>40</sup> *Ibid.*

<sup>41</sup> NAMLIT, Water Supply in Ovamboland 1960.

<sup>42</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 35.

archive in this phase does not indicate the channels of authority and processes involved in deciding where, when and how many excavation dams were to be built. However, a letter in 1954 from the Native Commissioner of Ovamboland to the Chief Native Commissioner, requesting that four excavation dams be built between Enana and Opepela, seems to indicate their involvement.<sup>43</sup> In that same year, the Assistant Native Commissioner informed the Native Commissioner that the Ukuanyama Council of Headmen expressed their thanks to the Work Department for the construction of dams and causeway dams in their area, while in 1961 officials mentioned that tribal councils 'voted' to decide how much of tribal trust funds were to be allocated to Water Works.<sup>44</sup> Thus it seems that institutions of local authority such as the Tribal Council and local officials like the Native Commissioner, under the supervisory authority of the Chief Native Commissioner, played some role in deciding where excavation dams were to be constructed. Given the fact that famine-relief work on the construction and maintenance of excavated dams continued in this period, it seems likely that the mode of construction under the supervision of Headmen continued too.

Despite the technical drawings and careful calculations in the design of excavation dams, they continued to be located on sites of old waterholes in *iishana* where local rain and flood runoff could be tapped.<sup>45</sup> The vast majority were therefore constructed in the northern half of the central Etaka-Cuvelai

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<sup>43</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from the Native Commissioner, Ovamboland to the Chief native Commissioner, Windhoek on 12.08.1954.

<sup>44</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from the Asst. Native Commissioner, Oshikango to the N.C. Ovamboland, Ondangua on 17.12.1954. SWAA. WAT 1921-1970. Ovamboland. Dams General. Storage Unit 145, 146. File no. W.W.81 – 22, Vol. 6, Letter from Sgd. Becker, Bantu Affairs Commissioner, Ondangua to Department of Water Affairs, 'Attention Stengel', Windhoek on 28.06.1961.

<sup>45</sup> Kreike, "Architects of Nature", 206.

delta and in 1961 a network of ten excavation dams were also constructed in the Etaka Oshana in the west.<sup>46</sup> A series of excavation dams was also constructed along the northern sector of the eastern zone towards Nkongo, where famine-relief dams had previously been constructed in the 1930s. In this area there were no *iishana* watercourses, but instead pans and *vleis*. Therefore, the dams in this area were located where they could best capture water directly from local rain in clay depressions and also tap nearby pans and *vleis*.

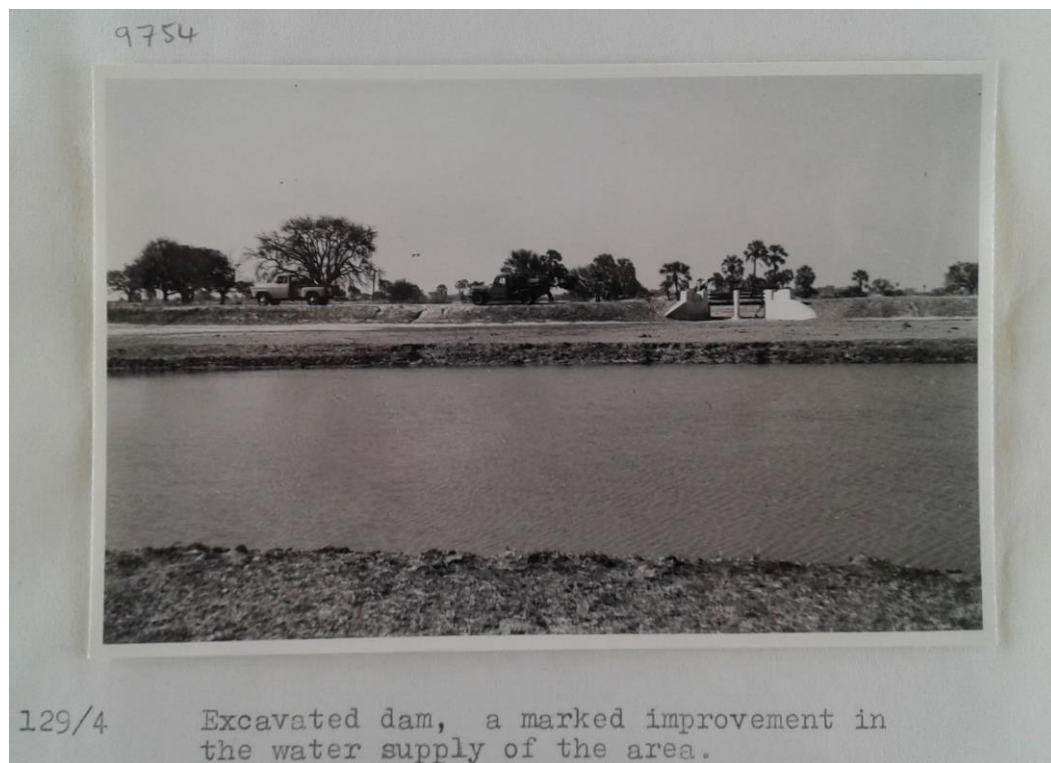


Image 19<sup>47</sup>

Being located mainly in *iishana* meant that over time these dams came to be filled with sedimentation which had to be periodically cleaned out. During times of famine, this sedimentation was cleaned out as a form of famine-relief

<sup>46</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 36.

<sup>47</sup> NAMLIT Brief Description of Water Supplies in Ovamboland 1966.

work, continuing the practice established by colonial officials in the 1930s. Famine relief work “was done with funds and labour provided by the Bantu Commissioner while Water Affairs Branch was responsible for the correct execution.”<sup>48</sup> The funds provided by the ‘Bantu Commissioner’, consisted of the grain and cash accumulated in the Tribal Trust Funds. The only other mention of local people working on these dams occurs in a 1960 Water Affairs publication, which claimed that

[a]t the beginning of the construction programme in Ovamboland it was expected from the natives that they will do their own maintenance work under supervision of their Headman. The maintenance methods were pointed out and consisted of erecting brushwood fences, grass planting on embankments, stabilisation of inflow channels by means of bushtimber, etc. Experience has shown that the natives are not sufficiently interested. Only one Headman succeeded in carrying out and maintaining the prescribed work.<sup>49</sup>



Image 20<sup>50</sup>

<sup>48</sup> NAMLIT, *Water Supply in Ovamboland 1960*, 7.

<sup>49</sup> *Ibid*, 10.

<sup>50</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968.

This seems to indicate that headmen had a degree of ownership and responsibility over excavation dams, which was also the case with those constructed as a form of famine relief from 1929. It also shows that in addition to the initial digging of the excavation by heavy machinery, and at times by women and children as famine-relief work, local people were expected to complete the construction of dams at the discretion of their headmen.

Despite more centralised planning and designing of excavation dams, it appears that they continued to involve local authority figures like Headmen in their construction and maintenance and continued to form part of the famine-relief work developed in 1929. Thus, we are able to uncover a layer of excavated dam infrastructure that continues beneath the presentations of the state. The archive of official publications attempted to invisibilise this layer and continuity, by simply referring to the production of dams as results effected by the state. Uncovering this layer undermines the narrative of the state – it undermines the purported control and agency of the state in relation to infrastructure.

Another type of smaller excavation dam also proliferated after 1954 in conjunction with road construction. Because Ovamboland was rather flat and flowing water spread evenly over such large areas, 'all-weather roads' were raised a few feet above the ground level. In order to raise the level of the roads, sand was excavated from borrow pits and piled up. By 1954, roads were constructed using heavy earth-moving machinery which were able to dig large borrow pits. Road construction workers were therefore instructed by the Director of Works to dig these large pits in *iishana* and pans where

possible, at one-mile intervals in order to form small and regular excavation dams that cattle could drink from.<sup>51</sup>

With the introduction of the large pump-storage dams and the major canals, excavation dams increasingly functioned only to provide drinking water for cattle in more rural areas. From the 1960s, they were increasingly thought of in terms of this function together with boreholes. By 1968, the main canals, pump-storage dams and the expanding network of pipelines were considered a 'modern' water infrastructure that was to supply 'developmental centres' and 'urban growth points' with a permanent supply of large quantities of water and filtered drinking water. Excavation dams and boreholes, with 'lower-quality' and smaller quantities of water, were considered "essentially for rural use".<sup>52</sup> Accordingly, their placement was planned to form a pattern that would allow cattle grazing to expand into areas with "unused grazing potential."<sup>53</sup> The pattern was to form a net with dams 11km apart "when the furthest grazing would be 6.2 km and the area served 10 000 ha."<sup>54</sup>

## CAUSEWAYS

Raised roads were also used to provide another form of water storage in the form of causeway dams. Roads that were constructed through the *iishana* networks of Ovamboland were raised on causeways to evade the seasonal floodwater that coursed through them. These causeways acted as embankments that blocked and dammed the gentle downward flow of water.

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<sup>51</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 36.

<sup>52</sup> *Ibid*, 53.

<sup>53</sup> *Ibid*, 20.

<sup>54</sup> *Ibid*, 53.

In these places the administration constructed either a bridge under which the flowing water was channelled to proceed, or a causeway that was designed to capture and hold the water.<sup>55</sup> Where such a causeway was constructed, the bed of the upstream *oshana* was usually excavated to provide a larger contained capacity, while the causeway was raised to a height that was calculated according to the measured flow in the *iishana*. Concrete piping was laid through some causeways in order to allow the flow of floodwater to continue once the causeway dam had been filled. The capacities of these causeway dams varied significantly with some so small that their capacities were neglected in official reports, while others were similar sizes to the larger excavated dams and their water levels were recorded together with those large excavated and pump-storage dams. Those recorded with other dams had capacities from 5,000 to 15,000 cubic yards, with depths ranging from 6 to 16 feet.<sup>56</sup> The causeway at Okatana formed an extremely large water mass of 3 000 000m<sup>3</sup>, and was referred to by officials as Oshakati Lake.<sup>57</sup> Causeway dams were not a new innovation. Modifying *iishana* to store more water was a common pre-colonial technique and was also part of dam designs to capture *iishana* water.

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<sup>55</sup> NAO [101] Scientific Research OV, 43-3 Water Supply, Letter from Director of Works, Windhoek to Chief Native Commissioner, Windhoek on 30.08.1950.

<sup>56</sup> NAMLIT, Water Supply in Ovamboland 1960, Attached list of Causeway Dams.

<sup>57</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 36.

Image 21<sup>58</sup>

The first causeway dam was constructed experimentally by the Department of Works in 1950 and then in 1953 they constructed nine along the Ondangua-Oshikango road as a form of famine-relief work.<sup>59</sup> From 1955 to 1958 the Water Affairs Department contracted several private construction firms to build 21 causeway dams throughout Ovamboland.<sup>60</sup> Contractors were also employed by the Water Affairs Department to enlarge and deepen causeway dams, while the Water Affairs Department itself was responsible for improving the causeway dam slopes, roads, fencing them off and draining nearby vleis into them to increase their catchment areas.<sup>61</sup> By 1959, a further

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<sup>58</sup> 32. NAMLIT Water Supply OV 1960.

<sup>59</sup> SWAA, Ovamboland – Water Supply. 1920-1951. A266 – 48. Vol.3, Letter from the Secretary to the Honourable the Administrator-in-Executive Committee on 10.02.1954.

<sup>60</sup> SWAA. WAT 1921-1970. Ovamboland. Dams General. Storage Unit 145, 146. File no. W.W.81 – 22, Vol. 3, Letter from the Department of Water Affairs to Chief Native Commissioner on 20.06.1958.

<sup>61</sup> NAMLIT, Water Supply in Ovamboland 1960.

17 causeway dams had been constructed by contract along the road from Ombalantu to Uukwaludhi.<sup>62</sup> The list of recorded water levels in the Water Affairs's 1960 publication indicated a total of 50 causeway dams out of a total 98 dams.<sup>63</sup>

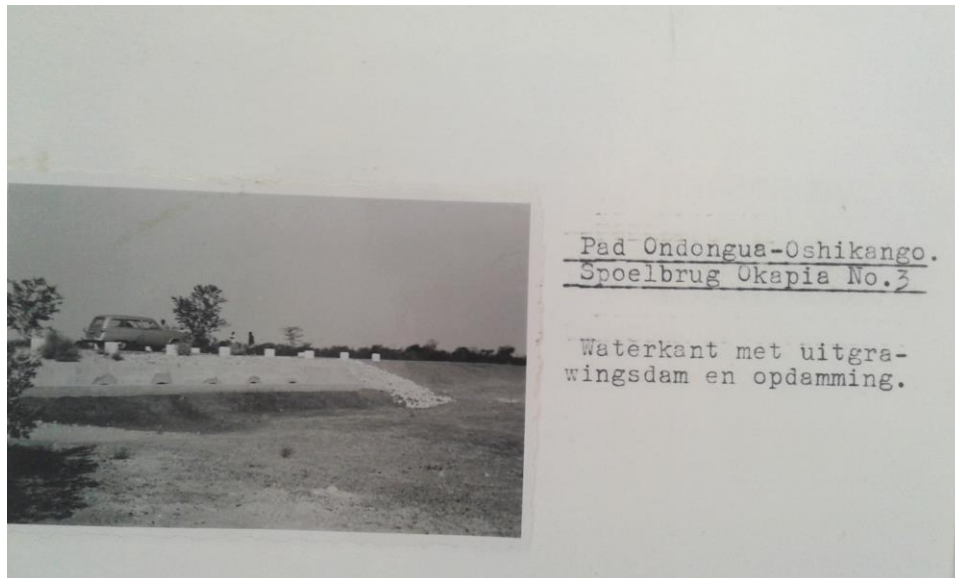


Image 22<sup>64</sup>

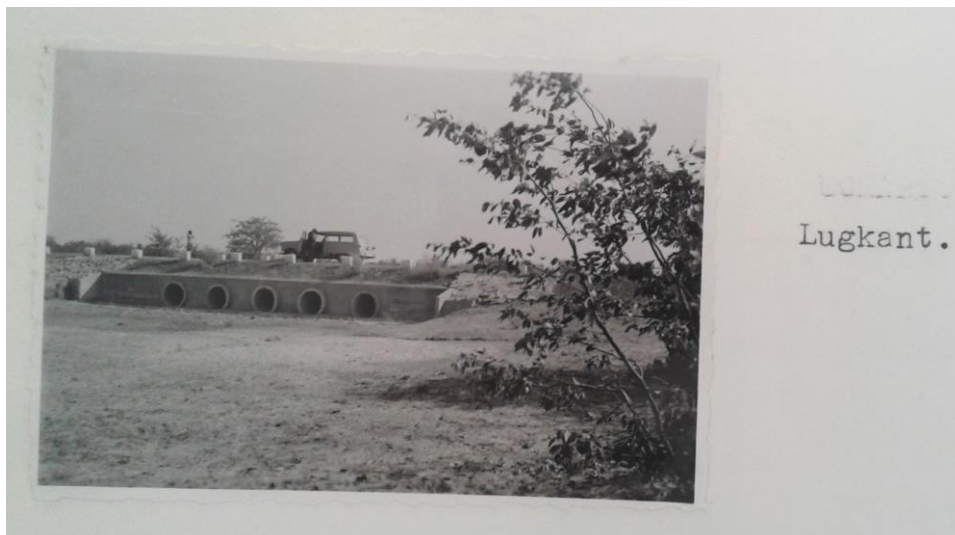


Image 23<sup>65</sup>

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<sup>62</sup> *Ibid*, Attached list of Causeway Dams.

<sup>63</sup> *Ibid*, Attached list of Causeway Dams.

<sup>64</sup> SWAA. Ovamboland – Water Supply. 1920-1951. Vol.3.

<sup>65</sup> SWAA. Ovamboland – Water Supply. 1920-1951. Vol.3.

Causeway dams were necessarily constructed where main roads ran through *iishana*. These main roads connected Ondangua to Ombalantu, Ondangua to Oshikango, and Ombalantu to Uukwaludhi; the established centres of colonial and tribal authorities. The 1958 proposed site plan of the Ombalantu-Uukwaludhi road shows how the planning and construction of roads and causeway dams were embedded and interconnected. The plan shows a sidelong view of the changing gradient measured along the proposed road, and indicates where water intersects it. Above it is another plan that shows the same road mapped from above, with the particular flows of all the *iishana* and *vleys* that form these water intersections. The second plan also indicates where schools, mission stations, kraals, wells, and waterholes are located in relation to the road and the *iishana*. This plan indicates that causeway dams did not conveniently make use of roads raised embankments that happened to pass through *iishana*, but that where roads passed through *iishana* and *vleys* was calculated in relation to the social and infrastructural landscape in order to provide effective causeway dams.<sup>66</sup> The attention paid to the specific relationship between roads and watercourses indicates a new sensitivity and patience to the subtleties of the flatness of Ovamboland. The 1958 site plan [Image 24] for the weir dam and hospital road at Okatana contains a similar combination of a top-down and sidelong view. The plan shows delicate mapping of the boundaries of the *iishana* and indicates gradients with a precision up to a hundredth of a foot.<sup>67</sup>

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<sup>66</sup> WAT 1921-1970, Ovamboland. Dams General. Storage Unit 145, 146. File no. W.W.81 – 22, Vol.3.

<sup>67</sup> *Ibid.*



from 24,500m<sup>3</sup> to 105,000m<sup>3</sup>.<sup>71</sup> The raised embankment was consolidated using a bulldozer and then grass and trees were planted along the embankments to further reinforce them and minimize erosion. Where the soil of the embankments was too porous, the inner slopes were protected with a concrete lining.<sup>72</sup> In 1957, dams were fenced off to stop cattle from drinking directly from them in order to prevent them trampling the embankments, while hand pumps were installed to limit the number of cattle that could be watered at the trough of the dam, with the aim of preventing overgrazing and trampling.<sup>73</sup> At some dams, however, the grass and trees were destroyed by termites after a few years.<sup>74</sup>

Unlike excavation dams, pump-storage dams were not constructed within the main *oshana* bed, but on a raised area fairly near it. Beside the pump-storage dam was constructed a large pump-sump which was connected to the *oshana* by a small canal, which in some cases extended a distance of up to 1 mile.<sup>75</sup> The pump-storage dam was in turn connected to the pump sump by two pipelines. One ran below ground-level through the embankment and filled the pump-storage dam to the water-level of the pump sump using gravity. Once this level was reached a valve inside the pipe closed and the water was sealed within the dam. The other pipe ran up and over the embankment, pumping water to fill the pump-storage dam.<sup>76</sup> On larger dams, these pumps were installed permanently, but on smaller dams, a pump was transported to the dam by tractor and temporarily connected to the pipe.<sup>77</sup> The Bantu Commissioner at Oshikango was responsible for pumping water into the

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<sup>71</sup> *Ibid*, 15, 20, 21.

<sup>72</sup> *Ibid*, 20.

<sup>73</sup> Kreike, *Architects of Nature*, 193.

<sup>74</sup> Driessen and Jokisch, "Current Status of 'Stengel Dams'", 21.

<sup>75</sup> NAMLIT, *Water Supply in Ovamboland 1960*, 4-5.

<sup>76</sup> Driessen and Jokisch, "Current Status of 'Stengel Dams'", 15.

<sup>77</sup> *Ibid*, 15.

dams in his area, while the Ondangua Bantu Commissioner did the same in his area.<sup>78</sup> Where dams were to provide water to missions and hospitals, they were responsible for the costs of installing and maintaining the engines for pumping.<sup>79</sup>

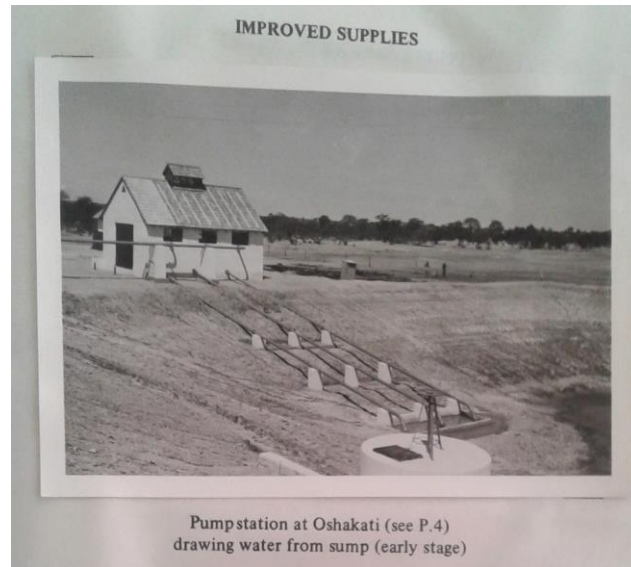


Image 25<sup>80</sup>



Image 26<sup>81</sup>

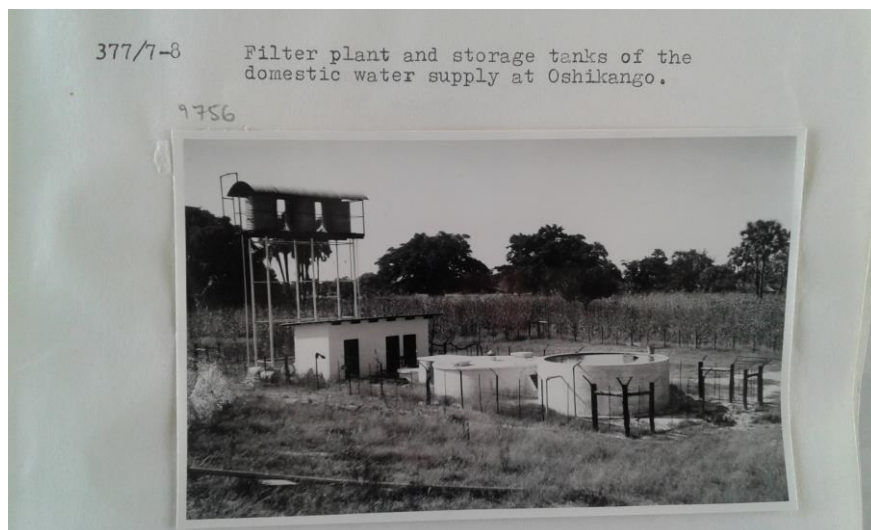
<sup>78</sup> NAMLIT, *Water Supply in Ovamboland 1960*, 7.

<sup>79</sup> Driessen and Jokisch, "Current Status of 'Stengel Dams'", 20-21.

<sup>80</sup> SWAA. WAT 1921-1970. Printed Reports. Ovamboland Master Plan 1968.

<sup>81</sup> Administration of South West Africa Water conservation branch 1956. In Cornelia Driessen, Alexander Jokisch. 2011, 'Current Status of 'Stengel Dams' in central-northern Namibia Report 2011', 15.

With raised embankments, pump-storage dams attained larger storage capacities than excavated dams. Being fed by a small canal allowed these dams to supply areas slightly further away from the main *oshana* network. Being located away from the *oshana* bed, they avoided the problem of silting that occurred in excavation dams, and therefore did not require to be cleaned out by local people. They were fenced off to prevent cattle from drinking directly from them in order to keep them clean and to stop the embankments being trampled.<sup>82</sup> Together these designs made the dams less connected to local people as they would no longer be cleaned out by them, and less accessible to local people as they were fenced off. For these reasons, they were favoured over excavation dams and equipped with sand-filters in the early 1960s to supply hospitals, mission stations and administration headquarters with clean drinking water.<sup>83</sup> By 1966, the drinking water from these dams was being pumped into elevated storage tanks after it was filtered and chlorinated, and then distributed by pipe reticulation systems.<sup>84</sup>

Image 27<sup>85</sup>


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<sup>82</sup> *Ibid*, 21.

<sup>83</sup> NAMLIT, *Water Supply in Ovamboland 1960*, 4-5.

<sup>84</sup> NAMLIT *Brief Description of Water Supplies in Ovamboland 1966*, 2.

<sup>85</sup> 33. NAMLIT *Brief Description of Water Supplies in Ovamboland 1966*.

Pump-storage dams were furthermore constructed at sites that the administration had selected for development in terms of irrigation schemes, agricultural schools, urban centres and sites for industrial production. The pump-storage dam at Okatana with a capacity of 85,550m<sup>3</sup> was constructed to be large enough for the administration to experiment with irrigation, while the larger dam with a capacity of 105,000m<sup>3</sup> was built specifically to provide drinking water for a large proposed state hospital and was used to experiment with methods of evaporation reduction.<sup>86</sup> These dams then were constructed to serve the needs of development as stipulated by the central planners, rather than to provide water for cattle and local people to drink, which the other dams did.

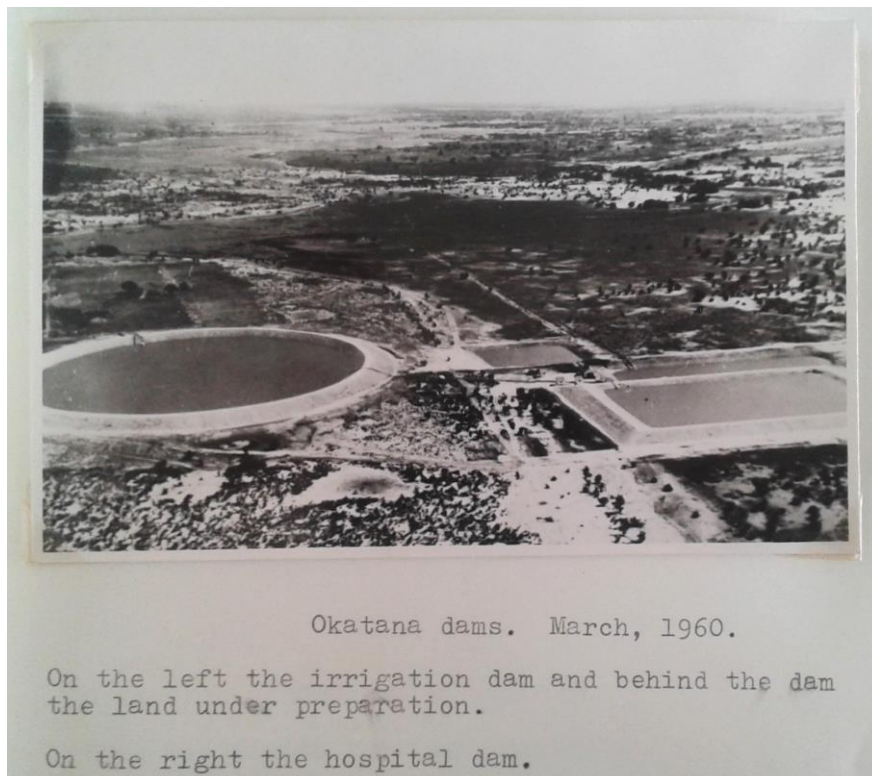


Image 28<sup>87</sup>

<sup>86</sup> Driessen and Jokisch, "Current Status of 'Stengel Dams'", 24.

<sup>87</sup> NAMLIT Ovamboland Canal Scheme 1961.

The Water Affairs Department's 1962-3 register of dams in Ovamboland described the construction of a total of 17 pump storage dams by that date.<sup>88</sup> Most of these were constructed at the same time as the major Okatana and Etaka canals and most were constructed beside them in order to utilise the water in the canals. Charting the number of pump-storage dams through the official archive is frustrating and discrepant. The 1968 Masterplan contains a map that indicates 76 pump-storage dams, most of which were located along the Etaka and Okatana canals, while all but four of the 17 with filters were located along the canal. The other four were located in and around Oshikango, where the assistant Bantu Commissioner was stationed.

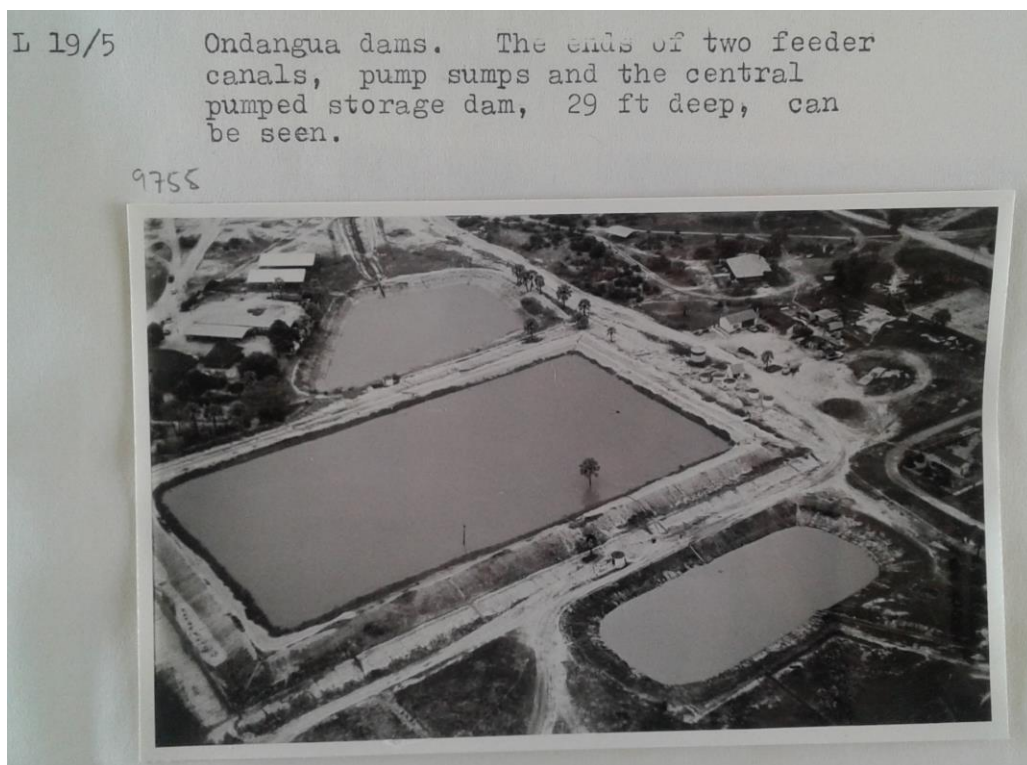
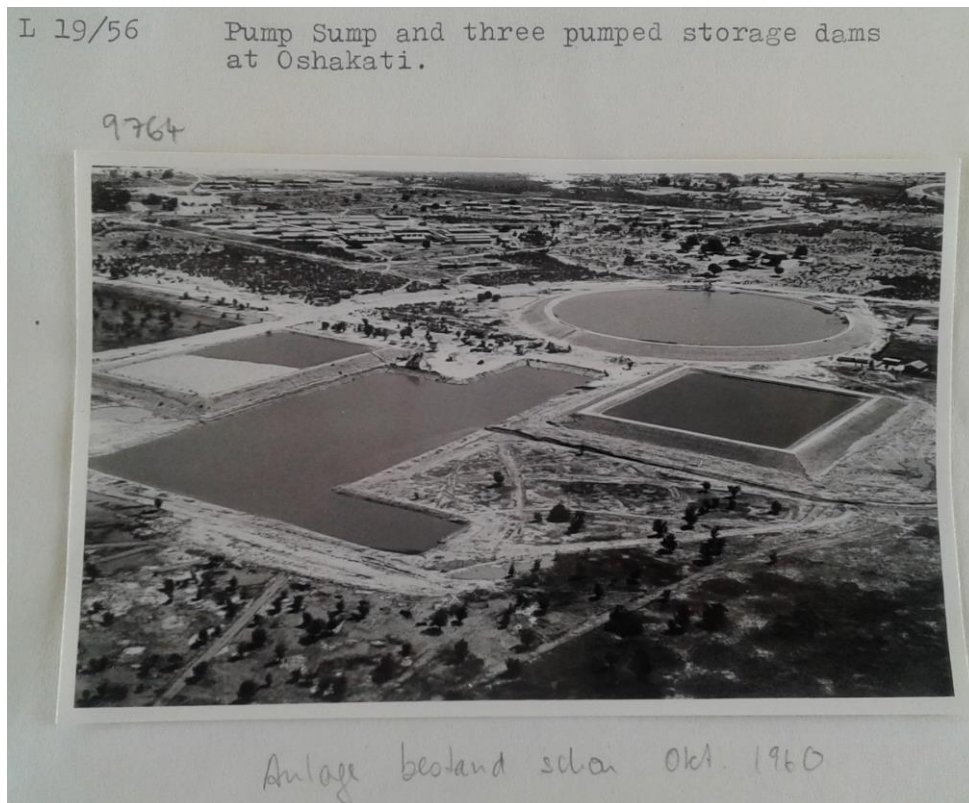


Image 29<sup>89</sup>

<sup>88</sup> S.W.A. Administration. Water affairs branch (1962/1963): Register of dams in Ovamboland. Windhoek, Namibia.

<sup>89</sup> NAMLIT Brief Description of Water Supplies in Ovamboland 1966.

Image 30<sup>90</sup>

While dams were constructed on a much larger scale in this period, with three seemingly distinct designs, they were fundamentally similar to earlier dams. They continued to tap water from *iishana* and employed a variety of established designs including small canals, raised embankments and weirs in *iishana*. While the archive largely silences and ignores the processes involved in their construction, many of these dams were constructed by local workers as a form of famine relief, and yet others were constructed by paid Ovambo workers.

#### CATCHMENT, PANS AND FEEDER CANALS

While the causeway dams, larger excavation dams and pump-sump dams succeeded in providing larger storage capacities, they still needed to be

<sup>90</sup> NAMLIT Brief Description of Water Supplies in Ovamboland 1966.

effectively filled. Excavation dams and causeway dams were constructed in or immediately beside *iishana* and *omurambas* and as such relied on the water that flowed through them. For these dams the *oshana* and *omuramba* networks formed an interconnected catchment scheme. While feeder canals allowed pump-storage dams to be located at a greater distance from *iishanas* and *omurambas*, they also remained dependent on these networks as their source of water. In this phase of dam building, the Water Affairs Department displayed a heightened sensitivity to the function of water catchment in their attempts to improve the effectiveness of capturing water from *iishana* and *omurambas*, and increasing catchment areas by capturing water from additional sources. As with the efforts to increase storage capacity, these modifications of capturing adapted and integrated established techniques and practices.

Improvements to the catchment capacities of dams began in 1954 in eastern Ovamboland. In this part of Ovamboland the *iishana* networks falter and instead of forming a dense interwoven network as in north central Ovamboland, they form a network of pools that seep from one to the next. The face of the earth in the east is less deeply wrinkled by *iishana* beds and is instead puckered by claypans. In such a flat landscape where local rain water collects and flows according to very slight differences in the gradient and composition of the soil, sporadic localised rainfalls run into the many small pans in the immediate vicinity. The improvements in the east consisted of draining nearby claypans into dams via shallow feeder canals, ‘improving’ the pans slopes to make water run down them more efficiently and grading slopes in a way to direct water straight to the dams.<sup>91</sup> From 1954 the Water Affairs Department also began studying the “run-off characteristics of these

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<sup>91</sup> NAMLIT, Water Supply in Ovamboland 1960, 20.

clay surfaces.”<sup>92</sup> For this, they tasked the Finnish Mission at Enana with recording the local rainfall and calculating the discharge into the dam there. The results were then compared to those of other dams.<sup>93</sup> In 1960, the Water Affairs Department also experimented with creating artificial catchment by applying bitumen to a suitably graded sand surface and leading the water into an excavated dam or pond that was lined with plastic sheets.<sup>94</sup>

During the drought of 1958-1959 when Ovamboland received very little rainfall and the *efundja* did not flow, a survey of 80 dams revealed that only 30% were full and only 40% contained water.<sup>95</sup> Of the 30% that were full, most were in eastern Ovamboland where rains had been better.<sup>96</sup> This alerted Water Affairs officials to the limitations posed by the fact that dams in central northern Ovamboland were dependent on water in *iishana* and *omurambas*. The northern central area of Ovamboland is covered by a dense network of *iishana*, which naturally forms a larger catchment area for rains and flood water. However, when rains in these areas are more localised and smaller, the many *iishana* channels act to diffuse the water and the trickles that manage to reach the dams are insignificant. Depending on its location, such rainfall may also concentrate and collect in small pans outside the *iishana* networks. Thus we see in 1960 that Okapia causeway dam had been empty since its construction in 1954, while nearby pans were filled every year.<sup>97</sup> The archive indicates that from 1959 the Water Affairs department focused heavily on improving the catchment capacities of dams in both the eastern and central

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<sup>92</sup> *Ibid*, 20.

<sup>93</sup> *Ibid*, 20.

<sup>94</sup> *Ibid*, 22-23.

<sup>95</sup> Kreike, *Architects of Nature*, 186-187.

<sup>96</sup> *Ibid*.

<sup>97</sup> NAMLIT, Water Supply in Ovamboland 1960, 6.

areas by digging feeder canals to drain nearby pans and *vleys* into dams and improving the slopes of those pans.<sup>98</sup>

While the Water Affairs Department focused on providing dams with water from additional sources, they also improved the discharge of water from *iishana* into dams in a way that reduced silting and erosion.<sup>99</sup> Improving catchment from *iishana* included greater surveillance of the water that flowed through them. The archive does not clearly indicate the time when more systematic measuring and recording of *iishana* floodwater began, but in 1960, the Water Affairs Department provided the first dedicated official report on the movement, duration and volume of water as it flowed through specific *iishana* and filled specific causeway dams, and pump-storage dams.<sup>100</sup>

As with the improvements to storage, state experts focused more acutely on improving catchment, but they did so according to the older regimes of surface water capture by attempting to replicate and improve existing technologies of feeder canals, clayed slopes and natural *vleys*. The dams still remained nested in the particular materiality of Ovamboland – they were located where they could plug into pans, *vleys* and *iishana* just like older dams and waterholes.

#### EFFICIENCY: EVAPORATION AND SEEPAGE

While this phase of dam construction was clearly marked by a focus on the efficient capture of water, it also gave new impetus to the question of water

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<sup>98</sup> *Ibid*, 7.

<sup>99</sup> *Ibid*.

<sup>100</sup> *Ibid*, 12.

loss, paying particular attention to evaporation and seepage. The first experiments to reduce evaporation of the dams in Ovamboland were carried out in 1957 by the Weather Buro in Windhoek using “STANOL”, which was a chemical similar to cetyl alcohol, and then later in 1960 on the dams at Ondangua.<sup>101</sup> In 1957, the Water Affairs Department was sharing information regarding scientific experiments with water with Portuguese officials and experts who were reportedly experimenting with water plants for reducing evaporation.<sup>102</sup>

In 1959, the Water Affairs Department conducted further experiments to reduce evaporation using ‘SAGEX’ sheets, which were used to cover the water surface at Onandjokue Dam to reduce contact with the air. These tests could only be carried out during the dry season, as in order to measure the losses in water the dams needed to avoid being topped up by rain. Only test results of one month were collected, however, as water shortages in the dry season of 1959-60 meant local inhabitants fetched and used water from the dam.<sup>103</sup> Tests with ‘FOMOLITE’ sheets were also conducted using tin drums, but the results were discredited.<sup>104</sup> Up to 1968, the Water Affairs department never managed to find a satisfactory method of reducing the evaporation from dams.

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<sup>101</sup> *Ibid*, 26.

<sup>102</sup> *Ibid*.

<sup>103</sup> *Ibid*, 25-26.

<sup>104</sup> *Ibid*.

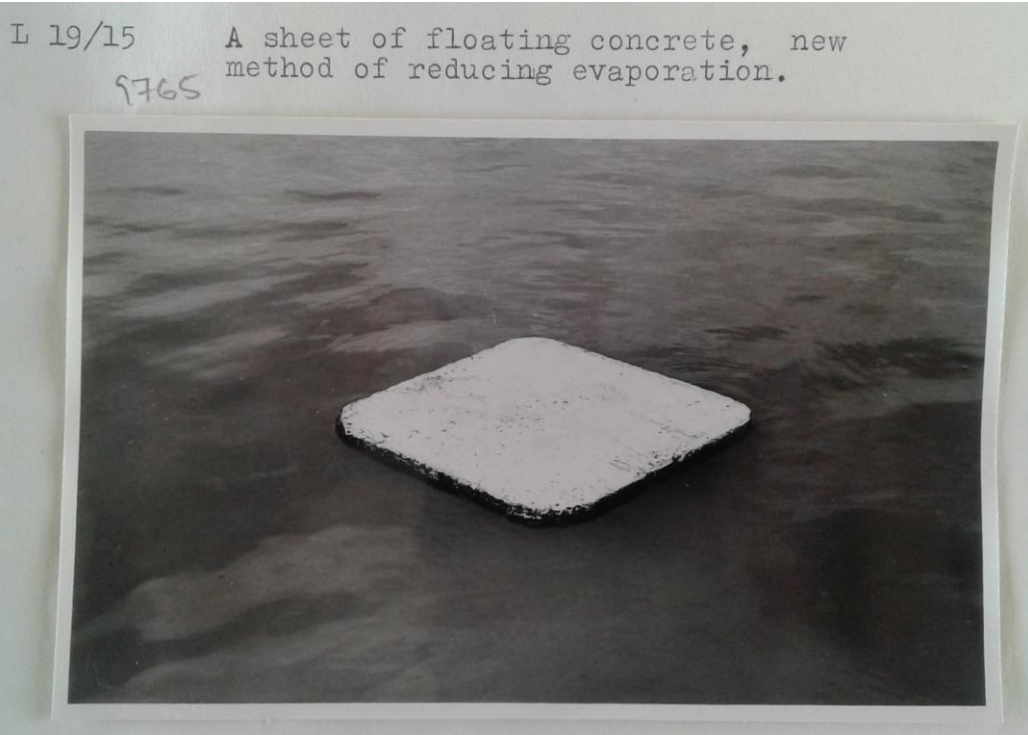


Image 31<sup>105</sup>

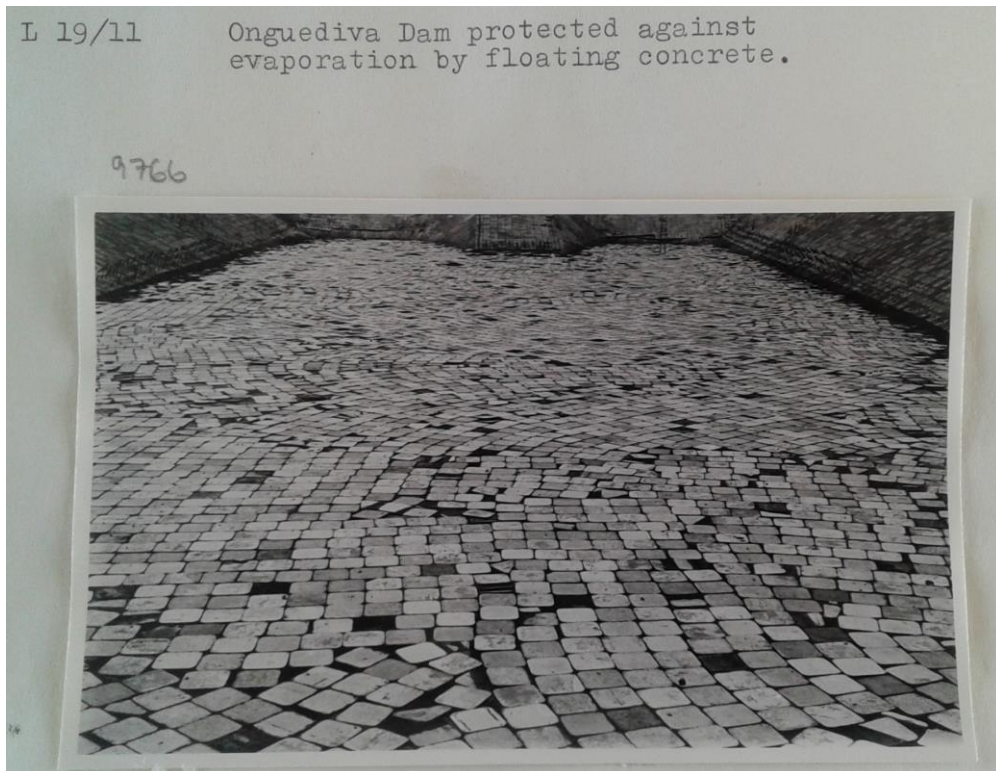


Image 32<sup>106</sup>

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<sup>105</sup> 33. NAMLIT Brief Description of Water Supplies in Ovamboland 1966.

<sup>106</sup> 33. NAMLIT Brief Description of Water Supplies in Ovamboland 1966.

In 1960, the Water Affairs Department also experimented with reducing water seepage into the sand by lining a small excavated dam at Ondangua plastic sheets. In the experiment the plastic sheets were destroyed by termites and the results were considered inconclusive.<sup>107</sup> Termites were also a problem for another experimental improvement on dams, destroying the grass and trees that were planted along the embankments of pump-storage dams to reinforce them and minimize erosion.<sup>108</sup> Water Affairs officials also tried to reduce erosion of pump-storage embankments by lining the upper section above the water loosely with large concrete bricks. However, the concrete bricks just slid down into the dams.<sup>109</sup>

## **BOREHOLES**

The 1968 Masterplan tells us that prompted by the findings of the Odendaal Commission, an intensive borehole drilling programme in the east and west was started in 1962, which overlapped with the construction of canals and dams in the central floodplain.<sup>110</sup> The sites of these boreholes were selected by Water Affairs officials and they were sunk by contractors. The Boring Inspector inspected the drilling of the boreholes; recording the strata indicated, the diameter and depth of the borehole, the results of the pumping

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<sup>107</sup> *Ibid*, 22-23.

<sup>108</sup> Driessen and Jokisch, "Current Status of 'Stengel Dams'", 21.

<sup>109</sup> *Ibid*, 14.

<sup>110</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 40.

test, the quality of the water, how much casing was left in the borehole and deciding when boring was to cease.<sup>111</sup>

This programme followed the distribution pattern recommended by the findings of the borehole explorations between 1948 and 1953, which echoed earlier investigations by state experts – that only the far eastern and western areas were suitable for boreholes. A map compiled by the Water Affairs Branch in May 1962, and revised in February 1963 and July 1964, indicates 5 unsuccessful and 15 successful boreholes in the east 12 unsuccessful and 11 successful boreholes in the west.<sup>112</sup> A Water Affairs map from 1965 indicates 41 successful fresh water boreholes, with only four in the west and 37 in the north-east. It also indicates 51 brak water boreholes, with 12 in the west, 27 in the central area, and 12 in the south-east.<sup>113</sup> The fact that the later map shows fewer successful boreholes in the west, is likely because they were added in by pencil after 1965. Another Water Affairs map from the 1968 Masterplan shows 35 successful boreholes in the west and 53 in the east.<sup>114</sup> The Masterplan claimed that between 1962 and 1968 a total of 250 boreholes had been sunk throughout Ovamboland at an average rate of about 30 per year.<sup>115</sup> The figures presented by the Water Affairs Department show a pattern that around one in every three boreholes that were sunk were successful by 1968.

Contrary to the Water Affairs Department's own publications, Kreike maintains that boreholes in Ovamboland were an overwhelming failure. He

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<sup>111</sup> SWAA. WAT 1921-1970. Ovamboland. Boring. Storage Unit 149. File no. W.W.81 – 22 – 1, Vol.1, Boring Reports Forms from 08.02.1963.

<sup>112</sup> SWAA. WAT 1921-1970. Ovamboland. Boring. Storage Unit 149. File no. W.W.81 – 22 – 1, Vol.1.

<sup>113</sup> NAMLIT Brief Description of Water Supplies in Ovamboland 1966, Map No. 9.

<sup>114</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, Map.

<sup>115</sup> *Ibid*, 40.

notes that boreholes were a very costly endeavour and that they had a very low success rate. For instance, he claims that in 1968 alone

49 drilling attempts had failed. Of the 54 boreholes that were successfully drilled, eight were inoperational due to a lack of equipment; five had too low a yield to make it worthwhile to install pumps; 14 yielded water unpotable to either human or animal; and in nine boreholes, the water quality was only suited for livestock consumption.<sup>116</sup>

Of the 54 successful sites, according to him, only 18 operational boreholes yielded water for human consumption.<sup>117</sup>

Through this thick description of the changes and continuities in the plans and designs of water infrastructure in Ovamboland, a pattern of integration and expansion is clearly discernible in the states approach. The integration of different infrastructural technologies developed in relation to the separate functions of capture and storage. These functions were increasingly connected together in efforts to form a total interconnected system that could be centrally controlled. This trend was informed by an evolving and increasingly prevalent discourse of development that directly connected water infrastructure to the establishment of particular services and facilities concerned with education, health, and urbanisation. Despite these new concerns, the colonial state remained primarily concerned with the overpopulation of people and cattle, and the prevalence of seasonal water shortages. In this phase, water infrastructure remained centred on a more immediate, tangible and technical conception of development.

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<sup>116</sup> Kreike, *Architects of Nature*, 188.

<sup>117</sup> *Ibid*, 188.

Despite these shifts in the states approach to water, there was no clear material separation from the previous water infrastructure. The integration and expansion of water infrastructure in this period depended on and was shaped by what had come before. The designs and functions of the dams and boreholes remained largely identical, while the construction of famine-relief dams, waterholes and wells continued parallel to privately constructed dams and boreholes. This water infrastructure continued to be built around the availability of surface water and the particular materiality of the ground in which it was held, channelled and seeped. The mapping of the surface and underground water in this period echoed earlier reports by state experts, and produced a similar imagination of water infrastructure.

#### **PERMANENT WATER AND HYDRO-ELECTRIC POWER: AN ABUNDANT FUTURE**

The state's plans for large-scale 'development' demanded a consistent and constant supply of water, which the irregular and sporadic rainfall and flooding of Ovamboland had persistently frustrated. Thinking of water as an object of economic development, the administration considered drought to be "a stumbling block to the development of a sound economy for the country", which dams alone had failed to eradicate.<sup>118</sup> In 1958 and 1959 the administration reported severe water shortages throughout Ovamboland and announced in official publications that they therefore decided a drastic intervention in the hydroscape was necessary. In 1959 they began planning the construction of two major canals that would cut diagonally through the landscape, tapping multiple pans and *iishana* and channelling the water to multiple large dams. As stated in the 1968 Masterplan:

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<sup>118</sup> NAMLIT, Water Supply in Ovamboland 1960, 32.

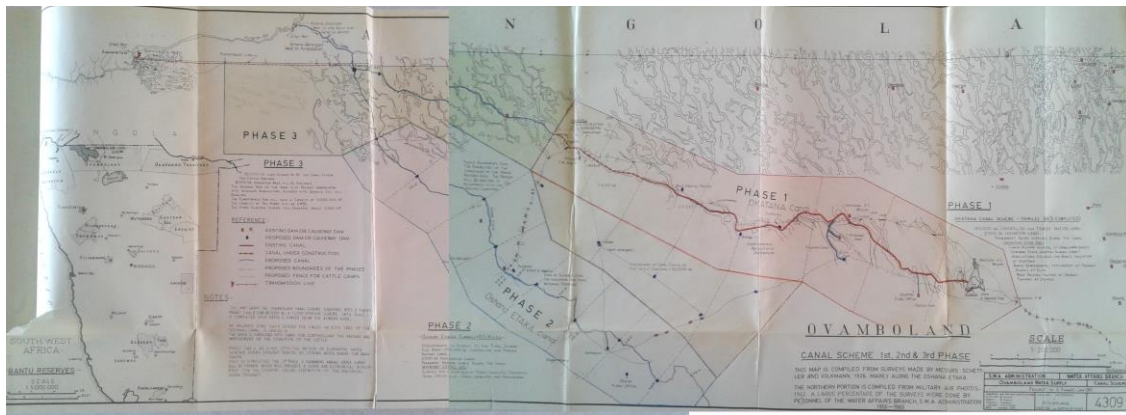
The next stage of this development was to consider the difficulties which arise in drought periods when the oshanas in the district fail to flow altogether. In the meantime, other districts may well experience runoff. The solution lay in the construction of a flood water collecting canal tapping a whole system of oshanas.<sup>119</sup>

This development was officially planned in three phases. The first phase involved the construction of the main Okatana Canal cut from Okatana in the central floodplain in a north-westerly direction towards the Kunene River, thus intercepting and capturing the south-flowing waters of the *iishana* in the central floodplain. The second phase saw the construction of the Etaka Canal excavated in the bed of the Etaka Oshana in a north-westerly direction from Ongandjera towards the Kunene River. In these first two phases, the canals were designed to capture seasonal surface and flood waters and channel them to major centres of development and colonial administration while filling new and older dams along the way. In the third phase, the canal was to be augmented by piping and it was planned to pump water from the Kunene River directly into the canals in order to provide a 'permanent' source of water no longer dependent on seasonal rainfall and floods. The first two phases as a flood canal were considered a temporary solution in anticipation of the third phase. As the centre-piece for their developmental plans, the colonial administration declared that "the completion of the project as a pump-canal, fed by the Kunene River, will contribute towards the support of a sound economical and political development of the country. Only a permanent water supply will solve these problems."<sup>120</sup> From the outset the canal was envisioned to draw water from the Kunene River, and it was designed with this in mind.

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<sup>119</sup> SWAA. WAT 1921-1970. Printed Reports. Ovamboland Master Plan 1968, 38-39

<sup>120</sup> NAMLIT, Water Supply in Ovamboland 1960, 1.

Image 33<sup>121</sup>

Already in 1926, the Union of South Africa had established legal rights to Kunene River water. In 1954, officials appeared very concerned that the Angolan irrigation schemes and the Matala hydro-electric scheme's use of Kunene water would encroach on the Union's share of the rivers water.<sup>122</sup> At the end of 1959, the South African government therefore carried out a technical investigation into the Kunene River, which concluded that their share of the water was diminishing.<sup>123</sup> The South African government's concerns with their claims to Kunene River water were primarily defined in relation to the generation of hydro-electricity; but the development of hydro-electric power was deeply entangled with, and contingent on, the diversion of Kunene River water for use by the inhabitants of Ovamboland.

Hydro-electric power and 'permanent' water from the Kunene River were linked together through the South African government's initial legal claims to a 'share' of the Kunene River's water in 1926. The initial agreement was

<sup>121</sup> NAMLIT, Ovamboland Canal Scheme 1961.

<sup>122</sup> SWAA. WAT 1921-1970. Dams – Kunene River. 1927-1963, Confidential. Letter titled 'Flow of the Kunene River' from Acting Director of Irrigation to the Secretary for External Affairs, Pretoria on 19.08.1955.

<sup>123</sup> SWAA. WAT 1921-1970. Dams – Kunene River. 1927-1963, Letter from Principal Technician to the Director of Water Affairs, Windhoek on 26.02.1960.

formulated such that the development of hydro-electric power was dependent on, and secondary to, the use of Kunene river water for the sustenance of the inhabitants of Ovamboland. Whereas previously the schemes were clearly differentiated in the official discourse (with permanent water being a 'humanitarian' matter and hydro-electric power being a matter for profit), they were fused under a new conceptualisation of development. As two parts of the same 'developmental' scheme, they were now to be technically and economically designed in tandem. They were initiated as a particular type of development, one defined by its form rather than content – a sort of religious development where its realisation by the state was a ritual. With the actual designing, planning and construction, the technical officials of the state began to calculate and 'fill-in' the developmental content.

As with the shift from coal energy to oil energy described by Timothy Mitchell, in which the abundance of energy invisibilised and seemingly detached from the physical environment and allowed for economic thought as merely money circulation, the rhetorical shift to seemingly inexhaustible 'permanent water' and hydro-electric energy allowed the colonial state to imagine the development of a totalised economy for Ovamboland detached from what occurred on the ground.<sup>124</sup> This imagination had a particular orientation to the future, where "the future was a limitless horizon of growth" and the economy was made the central object of politics.<sup>125</sup> Similarly, the uninterrupted flow of water and the flattening of seasonality in the water supply, allowed for the imagination of a reset – a new flat horizon cut off from the past upon which a new world could be built.

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<sup>124</sup> Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (London: Verso, 2013), 142-143.

<sup>125</sup> *Ibid*, 142-143.

### FOR REASONS OF 'HUMANITY' AND 'PROFIT': TAPPING THE KUNENE RIVER

Since 1926, arising from an Agreement with the Portuguese Government, the promise of bringing in permanent supplies from the Kunene river had been held. The manner, however, in which this was to be achieved remained unresolved until 1964 when a further Agreement was signed, paving the way for pumping of water from Calueque. Final approval of this scheme is now approaching reality.<sup>126</sup>

Drawing a flow of water from the Kunene River was imagined by South African officials long before 1959, and it had been imagined as an object of transformation in the colonial imagination long before the SWA administration began discussing it officially. In the 1890s, white settlers and colonialists discussed plans to 'return' the Kunene to its perceived previous course to the Etosha Pan in order to flood Ovamboland and transform the areas climate.<sup>127</sup> The idea surfaced again in 1919, when Ernest Schwartz, a geologist at Rhodes University College, proposed 'returning' the flow of the Kunene to the Etosha Pan and flooding the Kalahari Dessert in the interior in order to reverse a catastrophic process of southern Africa 'drying up'.<sup>128</sup>

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<sup>126</sup> NAMLIT, Ovamboland Canal Scheme 1961, 1.

<sup>127</sup> These discussions emphasised that the area was gradually drying up and imagined that this flooding would in turn produce more humidity and rainfall for the region. Renfrew Christie, *The Political Economy of the Kunene River Hydro-Electric Schemes* (Cape Town: UCT, 1975), 145.

<sup>128</sup> Schwarz claimed this process of 'drying up' would end in ecological and socio-economic catastrophe, where white farms would turn to desert and ultimately white civilization in the area would collapse. The scheme was hoped to "improve southern Africa's climate, green the desert, and open up vast new lands for settlement" and as such offered "a vision of empire cloaked in a vast technological project ostensibly designed not to expand South African rule but to save the Southern African environment from itself." This agrarian vision was actually more popular amongst white settlers in South Africa and SWA than it was amongst state officials, who only

Interest in generating hydro-electric power on the Kunene River however only entered the official archive in 1926, when the governments of Portugal and South Africa signed an official agreement regarding the location of the border between Angola and SWA – down the middle of the Kunene River from its mouth up to a point at Rua Cana Falls. In conjunction to this agreement the two governments signed another treaty “regulating the use of the water of the Kunene River for the purposes of generating hydraulic power and of inundation and irrigation in the Mandated Territory of South West Africa.”<sup>129</sup> This agreement allowed for the government of South Africa to use its share of the water to generate hydraulic power and construct any necessary dam, weir or barrage in Portuguese territory not more than 3km from the boundary therefore.<sup>130</sup> For “reasons of humanity” the Portuguese government also agreed that the government of South Africa may channel their share of the Kunene River water into Ovamboland.<sup>131</sup> Echoing earlier colonial fantasies of redirecting the flow of the Kunene River was the premise that “for time immemorial portions of Ovamboland now forming part of the Mandated Territory of South West Africa have periodically been inundated by the flood waters of the Kunene River overflowing its banks at various points in Portuguese Territory” and that such inundation was vital to “the very existence of the native tribes of Ovamboland”.<sup>132</sup> For the purposes of such inundation and irrigation for the ‘native tribes’ the agreement

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undertook investigations into the feasibility of the scheme in 1925, 1937 and 1945 in response to public pressure. McKittrick, “An Empire of Rivers”, 488.

<sup>129</sup> SWAA. WAT 1921-1970. Dams – Kunene River. 1927-1963. Official Agreement between the Governments of South Africa and Portugal. 22.06.1926.

<sup>130</sup> *Ibid.*

<sup>131</sup> *Ibid.*

<sup>132</sup> *Ibid.*

specifically referred to the construction of a “canal, channel or other aqueduct from the Kunene River”.<sup>133</sup>

In this early agreement the focus was placed on the diversion of the Kunene River for the subsistence of ‘the natives’, while the generation of hydro-electric power appeared as an addition for a potential future project. It was agreed that the water “for the purposes of providing means of subsistence for the Native tribes” would accrue no charges, but for water used for hydro-electric power generation, or other “purposes for gain”, it was agreed that the government of South Africa would pay. The two issues were deeply entangled in the initial agreement, with the development of hydro-electric power framed as secondary to, and contingent on, the diversion of the river for the ‘subsistence of the natives’.

The Kunene River Water-Use Treaty established that both governments would appoint members to form a joint technical commission that would investigate and report on the feasibility of diverting Kunene River water, fix the points for diversion, design the diversion works and canals, and estimate the costs involved.<sup>134</sup> The commission extensively and repeatedly investigated, studied and measured the gradients of the land from the Kunene River towards Ovamboland, they mapped the rivers path paying close attention to the height of its banks, they measured the volume and speed of the rivers flow at different points, and they measured the catchment areas of the Kunene and Cuvelai Rivers.<sup>135</sup> In other words the commission was intended to render the river legible and reproduce it as a technical object that could be divided and owned. They realised that most of Ovamboland’s flood

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<sup>133</sup> *Ibid.*

<sup>134</sup> *Ibid.*

<sup>135</sup> SWAA. WAT 1921-1970. Dams – Kunene River. 1927-1963. Report on Kunene Reconnaissance. Written by Spence on 22.08.1927.

water actually came from the Cuvelai River, and that the Kunene River flooded only the Oshana Etaka in the west. In 1928 the South African government finally decided that flooding the Kunene River into Ovamboland was impossible as no agreement could be reached with the Portuguese government's delegation to allow a large enough weir to be constructed.<sup>136</sup> In the end, it was the technical characteristics of a weir that thwarted the seemingly omnipotent and omniscient state from diverting the Kunene River.

Only in 1954 did the colonial administration return to the question of generating hydro-electric power on the Kunene River and diverting its water for use in Ovamboland. This interest was seemingly sparked by the Secretary for SWA out of concerns that Angolan irrigation schemes and the Matala hydro-electric scheme use of Kunene water would encroach on the Union's share of the rivers water.<sup>137</sup> After a brief investigation into the prior agreement, South African officials determined that "the question of feasibility of the diversion undertaking was never decided by the Commission in accordance with its terms of reference, and its activities may be considered to have been postponed sine die."<sup>138</sup> At the end of 1959 the South African government therefore carried out a technical investigation into the Kunene River, reporting on the development of the Matala hydro-electric scheme and related irrigation schemes.<sup>139</sup> The Principal technician reported that the Portuguese were working on several long-term projects to harness the water of the Kunene river and its main tributaries, and that as a result "it is clear

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<sup>136</sup> SWAA. WAT 1921-1970. Dams – Kunene River. 1927-1963. Letter from the Acting Director of Irrigation to the Prime Minister, Cape Town on 13.04.1928.

<sup>137</sup> SWAA. WAT 1921-1970. Dams – Kunene River. 1927-1963, Confidential. Letter titled 'Flow of the Kunene River' from Acting Director of Irrigation to the Secretary for External Affairs, Pretoria on 19.08.1955.

<sup>138</sup> *Ibid.*

<sup>139</sup> SWAA. WAT 1921-1970. Dams – Kunene River. 1927-1963, Letter from Principal Technician to the Director of Water Affairs, Windhoek on 26.02.1960.

that the flow of the Kunene at our boundary will become progressively less and less and that the interests of South West Africa are being adversely affected.”<sup>140</sup>

### HYDRO-ELECTRIC POWER AND A NEW CONCEPTUALISATION OF DEVELOPMENT

Framing the return in interest in hydro-electric power as a surprised reaction to Portuguese activities however betrays earlier growing interest from discussions of the Kunene River amongst South African officials. To point out some key dimensions of this discussion I look at a key text published in the *South African Journal of Science* in 1949 by Dr D. F. Kokot, the previous Chief Engineer of the Department of Irrigation in South Africa.<sup>141</sup>

The text immediately set the stage to the level of the nation:

In a country so arid as ours water conservation and utilization are matters of the greatest national importance, and the spectacle of a river in flood raises the question whether and why the energy of the rushing waters cannot be harnessed and turned to the use of the nation.<sup>142</sup>

Immediately water, in its multiple and varied forms and localities, is made homogenous as part of one whole national economy. The terms ‘national importance’ and ‘use of the nation’ maintain an absent value as if the particular modes through which water should be conserved, utilized, harnessed and used were not directly to any specific content or ideology of

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<sup>140</sup> *Ibid.*

<sup>141</sup> D. F. Kokot, “Hydro-Electric Power Possibilities in Southern Africa”, *South African Journal of Science*, 45 (1949), 21. Christie, *Hydro-electric Power*, 119.

<sup>142</sup> *Ibid.*, 21.

government policy. These terms make water infrastructure appear apolitical; as something that can be neutrally adopted by any range of political interests. They make water infrastructure appear as straightforward development.

The capitalist obsession with growth and production, together with the technical expertise's focus on homogenous energy allowed the author to produce water as a decontextualised quantifiable resource that could be converted into a homogenous currency which in turn would allow for contentless production and economic growth. In the text water, electricity and labour were framed as homogenous forms of energy, which were compared to each other in order to represent a certain shift in the conceptualisation of the South African economy based on energy-sources: "In terms of man-power a unit of electricity can do as much work as a man in two full working days, or in some classes of work even as much as he can do in five days."<sup>143</sup> By directly comparing the efficiency of energy extracted from labour and electricity, Kokot celebrated "this age of machines, when electric power, cheap and abundant, is so essential to keep the wheels of industry in motion."<sup>144</sup> Electricity as an energy-source was represented as modern and much more efficient to do industrial work. Labour as an energy-source in contrast was represented as cumbersome and outdated.

One of the functions of the text was to allow the public to imagine abstract homogenous electricity and water, in order to think of the broader economy and labour in these terms. They were made conceivable by relating them to human labour, in terms of how much work they could do in a day. The energy of labour and electricity were only differentiated in terms of their efficacy in relation to different unspecified 'classes of work'. This abstraction

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<sup>143</sup> *Ibid*, 32.

<sup>144</sup> *Ibid*, 21.

of work and energy achieves an effect where they appear to be simple compatible cogs in a neat machine, where the machine is the national economy. The national economy forms the invisible frame within which work and energy seemingly float detached. Where the abstract 'wheel of industry' can be dipped into the rushing water, wherever it is, to harness that energy for profit, for the nation.

In contrast to the above fantastical rhetoric of work, energy and the national economy, the text also raised questions of specificity. Considering more closely the locality of the site of hydro-electric power generation, Kokot pointed out that "the barrier to develop [hydro-electric power] is the apparent lack of any use for power."<sup>145</sup> The specificity of energy and work here appear to pose a problem that the earlier abstract formulations, such as 'for the use of the nation', avoided. This shows that the development of hydro-electric power was not driven by an immediate need for the electricity it would produce, rather, it was seen as a potential source of electricity the use of which could be 'filled in' later. As such it was considered an economic object of speculation and investment for the future. The urgent need to harness the energy resource of flowing water was thus driven by a notion of development valuable in and of itself, but one that ultimately hinged on profitability: "Every pound of coal that can be converted into energy, and every quarter million gallons of water that falls one foot, represents as much work as a labourer can perform in two to three days ... With these millions of slaves at our service what can we command them to do because much will depend on the answer to that question whether many sources of untapped power can be profitably exploited."<sup>146</sup>

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<sup>145</sup> *Ibid*, 31.

<sup>146</sup> *Ibid*, 33.

The Cunene River was described in great specificity and detail, but in quantified terms that maintained the homogenous nature of water as a resource. It furthermore provided a vast detailed calculation of the production of energy from the Kunene River, in the absence of any use for it. In fact, the lack of use for it was raised as a problem, but in spite of this there remained a compulsion to harness it, to show in great numerical detail the potential for profit and development going to waste. I argue that it was the self-perception of the state officials and experts, of the state as a modern rational capitalist leviathan, that compelled them to view the Kunene River as a resource and to develop hydro-electric power on it. Rather than acting according to any 'actual' economic logic of reducing costs of production, it was a fantasy amongst officials of reducing those costs, even when those specific costs were not yet apparent, that drove development.

This conceptualisation of development associated with hydro-electric power also informed the scheme to divert Kunene River water into Ovamboland. The two projects were tied together in the first instance by the 1926 legal agreement that made the development of hydro-electric power contingent on the development of water diversion for Ovamboland's inhabitants. Because South Africa's share of Kunene River water was divided between hydro-electric power and the canal scheme, these two developmental projects were planned and considered together as necessarily interconnected parts. They were therefore further connected by the technical considerations of the projects in terms of economy and practicality. The storage and regulation of Kunene Water, had to take into consideration the designs and requirements of both functions, which consequently overlapped.

The construction of the canal scheme began in 1959 and crept towards the Kunene River before the Portuguese government had agreed for the diversion

of the rivers water into it. It was at one level a bold and concrete gesture of confidence that the South African government would get their share of water. Here there is a performative quality as the state flexed its strength through the large scale of the canal scheme and the use of heavy machinery. There is also a ritualistic quality in the sequence that echoes the 1926 agreement as if honouring the initial spirit of the contract. In this ritual the canal is constructed 'on humanitarian grounds', as a gesture of good faith, to honour the spirit of the legal bind. With this spirit appeased, they expected to be permitted their hydro-electric scheme. This performance also reinforced the bond between both schemes to form a single development project – that type of development conceptualised as a form more than a content.

#### CONSTRUCTION OF THE CANALS

In 1959, the Water Affairs Department planned and began the construction of the first stage of the major canal 62 miles long from Okatana to Ombalantu. As a flood canal its main proposed functions were to connect all the *iishana* which the canal crossed in order to: 1) Fill the excavated dams along the canal, mainly for stock watering 2) Supply pump-storage dams for irrigation and the proposed agricultural school at Okatana 3) Supply water to the pump-storage dams for the Roman Catholic Mission Hospital at Oshikuku, the hospital in Ombalantu and for the proposed State Hospital at Okatana 4) supply water for proposed industrial undertakings of a meat factory, bone meal factory, tannery, and furniture factory at Okatana.<sup>147</sup>

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<sup>147</sup> NAMLIT, Water Supply in Ovamboland 1960, 40.

The first 14.5 miles of canal was constructed directly by the Department of Water Affairs and began in November 1959 from Ombalantu south-easterly to Okatana where the large pump-storage dam was constructed in conjunction with the canal.<sup>148</sup> The canal was dug using two caterpillar bulldozers and two tipper trucks that were operated by white foremen and 'native operators' who had been previously trained and employed in bulldozing by a private company that had constructed dams in Ovamboland.<sup>149</sup> In two places the digging hit solid rock before reaching the required depth and here the rock was blasted away using explosives.<sup>150</sup> By constructing the canal from the south to the north, it allowed the completed sections to function while construction continued further up. From the start of construction in 1959 the canal had a flow of water every year up to 1968, "distributing life-giving water to the full reach of the canal between Ombalantu and Oshakati".<sup>151</sup>

The rest of the canal construction was given out on private contract and by February 1961 the canal had reached a length of 50 miles with 15 dams 12 feet deep excavated beside it. As with road construction, the excavated material from these dams was used as embankment fills for the canal.<sup>152</sup> In most parts the canal was three feet deep, while at its deepest it reached 8 feet deep. With such a small gradient, varying between 1:16000 and 1:8000, and being reliant on gravity to pull the water down the canal: it could not have any stretches too long that were flat or sloped upwards.<sup>153</sup> So where the surface of the land remained too flat or sloped upwards, the canal bed needed to be dug deeper.

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<sup>148</sup> NAMLIT, Ovamboland Canal Scheme 1961, 3.

<sup>149</sup> SWAA. WAT 1921-1970. Ovamboland. Dams General. Storage Unit 145, 146. File no. W.W.81 – 22, Vol. 3, Document by Department of Water Affairs titled 'Departmental Work with Bulldozers in Ovamboland', dated 13.05.1959.

<sup>150</sup> NAMLIT, Ovamboland Canal Scheme 1961, 3.

<sup>151</sup> SWAA. WAT 1921-1970. Printed Reports. Ovamboland Master Plan 1968, 38.

<sup>152</sup> NAMLIT, Water Supply in Ovamboland 1960, 36. NAMLIT, Water Supply in Ovamboland 1960, 36.

<sup>153</sup> NAMLIT, Water Supply in Ovamboland 1960, 35.

It was initially constructed as an earth canal without any concrete lining and it dammed up *iishana* by means of embankments on the southern side of the canal with spillway provisions so that surplus flow would be released down the *iishana*.<sup>154</sup> That it was left unlined led to maintenance problems with erosion and silt washing in.<sup>155</sup> Only in 1966 were private contractors employed to line portions of the canal with concrete. The photograph below shows the Ovambo men employed by these private companies to perform much of the work.

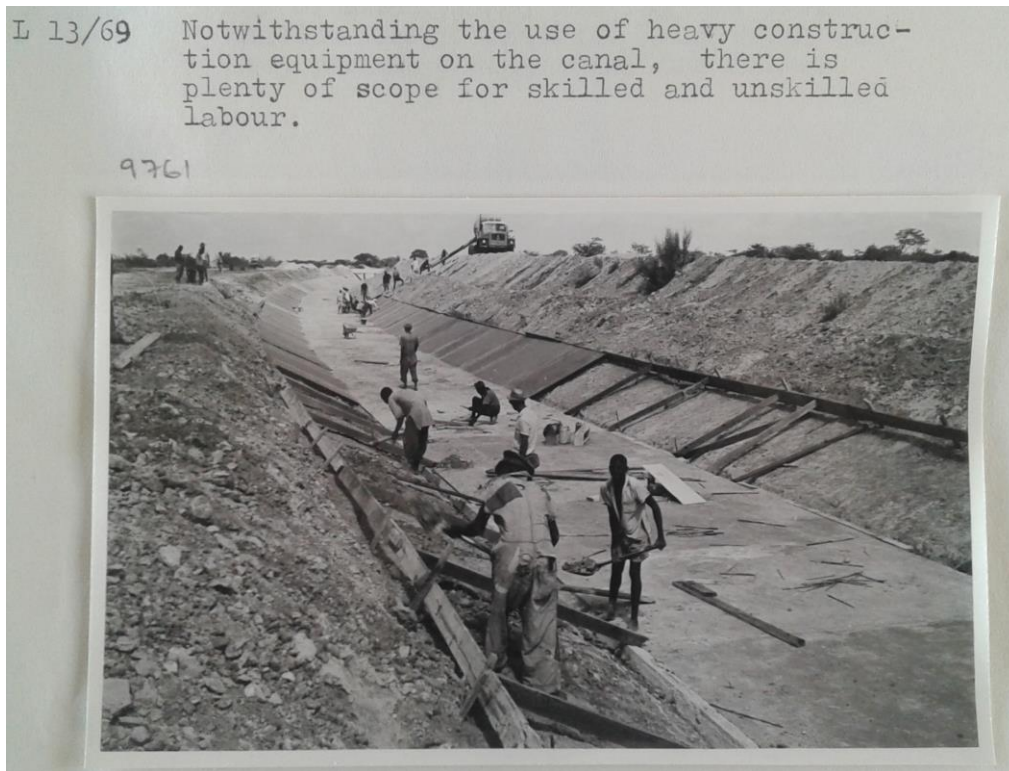


Image 34<sup>156</sup>

The canal had twelve bridges constructed across it spaced 3-4 miles apart, with the first four located to connect Mission Stations to outlying schools.<sup>157</sup>

<sup>154</sup> *Ibid*, 35.

<sup>155</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 60.

<sup>156</sup> NAMLIT, Brief Description of Water Supplies in Ovamboland 1966.

<sup>157</sup> NAMLIT, Water Supply in Ovamboland 1960, 36.

Sluice gates were combined with the bridges to control the flow and volume of water, and with water level recorders to measure and record flood levels. These were operated by a “trained bantu supervisor” who was stationed on site in a two-roomed house and paid a nominal wage.<sup>158</sup> The canal was designed to have a wide bed in order that it could act as a dam if the sluice gates were closed.<sup>159</sup> This greater width however compromised on its efficiency as more water was lost by evaporation. The Finnish Mission and its hospital at Elim were also prioritised and connected to the main canal by a branch canal running 10 km to the Elim dam.<sup>160</sup>



Road crossing over the canal near the Oshikuku. Nearing completion.



A “so called” canal bridge crossing for men and cattle. Such a bridge is constructed more or less every 4 miles.



A sluice constructed in the Oshikuku section of the canal. Installation is nearing completion.



CANAL IN FLOOD near Mile 18 (Oshikuku) Automatic Water Level Recorder for flood records installed on the sluice 8.2.61

<sup>158</sup> NAMLIT, Ovamboland Canal Scheme 1961, 4.

<sup>159</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 60.

<sup>160</sup> NAMLIT Ovamboland Canal Scheme 1961, 38-39;

Image 35<sup>161</sup>

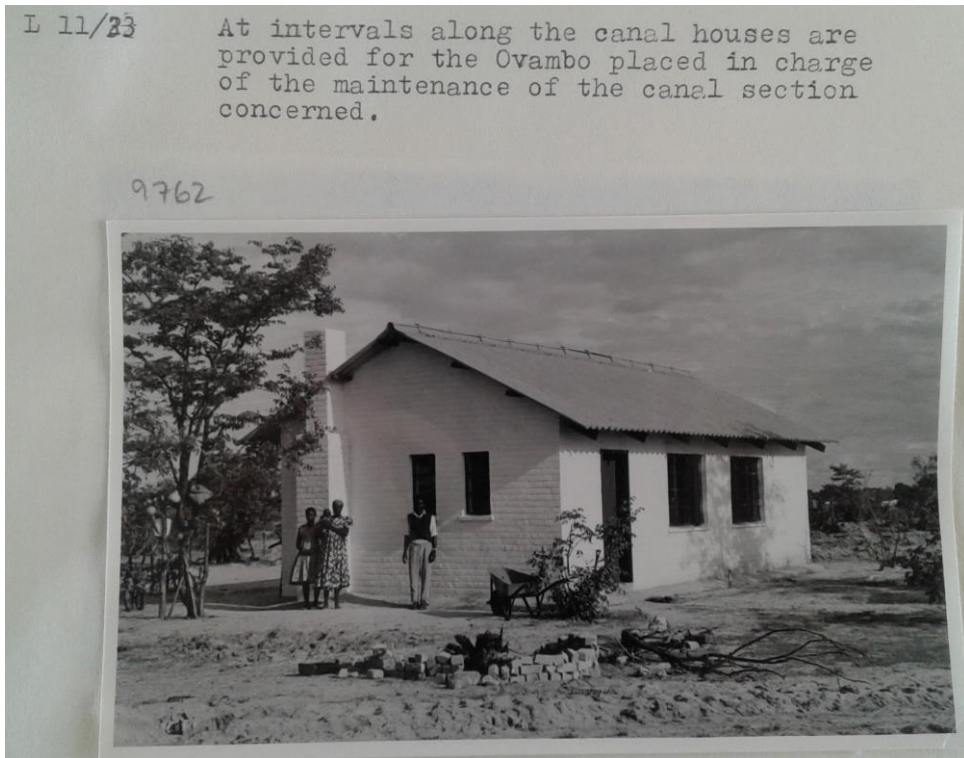


Image 36<sup>162</sup>

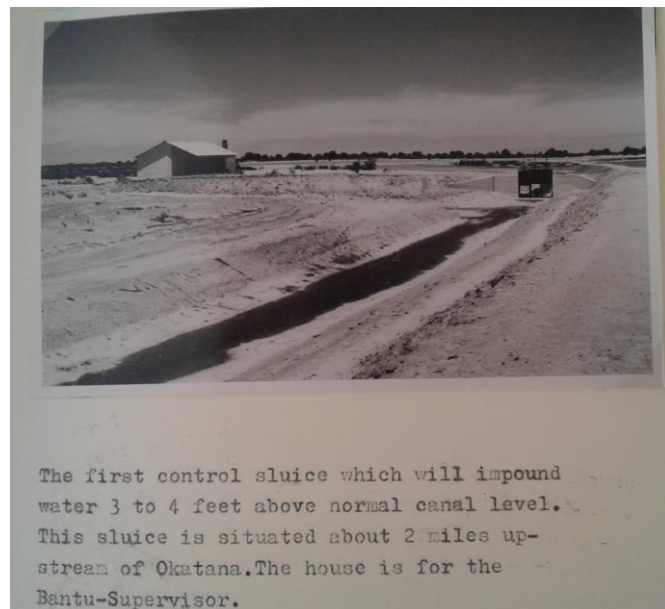


Image 37<sup>163</sup>

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<sup>161</sup> *Ibid.*

<sup>162</sup> NAMLIT, Brief Description of Water Supplies in Ovamboland 1966.

The canal captured and redirected flood water that would otherwise have continued to the areas south of it, and this caused problems for people living south of it, as expressed by Paulus Siyemba at a 'tribal meeting' in 1961 in response to the secretary calling for no more speakers: "It will be difficult because the canal has cut off the water."<sup>164</sup> The Bantu Affairs Commissioner for Ovamboland reported to his superiors that inhabitants south of the canal "have objected because their water in the pans and storage/gathering places nearby their huts is led away."<sup>165</sup> Where the canal crossed and dammed *iishana* near main roads, the road causeways were improved to manage the subsequent increased volumes of water.<sup>166</sup> From 1964 to 1967 the administration upgraded the all-weather road from Okatana to Ombalantu alongside the canal. The road was constructed with concrete bridges and 'drifts' to provide better access to the canal and to protect it from being damaged by floods.<sup>167</sup> The road and canal combination effectively dammed 18 *iishana*, which further decreased the amount of floodwater flowing downstream of the canal and road.<sup>168</sup>

By 1965, the canal was completed from Ombalantu to Okatana Dam. Eastwards of Okatana the gradient rises, but the administration was determined to supply Ondangua with 'permanent' water as it contained the central administrative headquarters and from there it could be further extended to supply to their most prioritised 'tribes' – the Ondonga and Oukwanyama. The administration therefore constructed a costly 37 km long

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<sup>163</sup> NAMLIT Ovamboland Canal Scheme 1961, 38.

<sup>164</sup> Kreike, *Architects of Nature*, 190.

<sup>165</sup> *Ibid*, 190.

<sup>166</sup> NAMLIT, Ovamboland Canal Scheme 1961, 4.

<sup>167</sup> Kreike, *Architects of Nature*, 191.

<sup>168</sup> *Ibid*, 191.

pipeline from Okatana Dam to Ondangua through which water was pumped.<sup>169</sup> From Ondangua pipelines extended further to Onandjokwe, Oshigambo, Olukonda and Onanjena with a total length of 88km.<sup>170</sup>

The second stage involved the construction of the 60-mile-long Etaka Canal along the Etaka Oshana between Eunda and Ongandjera. The Oshana Etaka was the main drainage watercourse in the north-western area and flood water naturally concentrated along it. The nature of the canal as using gravity and exploiting pre-existing watercourses, combined with the location of its source the Kunene River in the north-western part of Ovamboland and the Etaka Oshana just south of it, made it an easy and relatively cheap option for the administration to undertake. Initially the canal was constructed as a flood-collecting canal with the ultimate aim that it would form a second artery to carry 'permanent' Kunene River water into Ovamboland.<sup>171</sup> It was constructed entirely by private construction companies on contract who also constructed ten excavation dams, sluice gates and bridges along it.<sup>172</sup> The 1968 Masterplan claimed that this canal was constructed to supply water for urban and farming development and would similarly be supplied with water directly from the Kunene River.<sup>173</sup> This canal received much less attention in the Water Affairs Department's publications and the proposed plans for developments using the water remained vague. The areas it carried water to were much more sparsely populated compared to the central and north-eastern parts of Ovamboland, and historically had little involvement with the colonial administration and had received hardly any attention regarding water

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<sup>169</sup> *Ibid*, 189.

<sup>170</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 39.

<sup>171</sup> *Ibid*, 64.

<sup>172</sup> NAMLIT, Ovamboland Canal Scheme 1961, 6.

<sup>173</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 64.

infrastructure. However, with the prominence of separate development and apartheid, Ovamboland was increasingly treated as a bounded territory that constituted a whole. From the late 1940s plans for Ovamboland were increasingly framed in terms of the whole territory and subsequently the north-western areas received more attention.

The completed Okatana and Etaka canals were celebrated as a resounding success in the Water Affairs publications. They originally manifested as a solution to the catchment problems faced by the dams in the central northern floodplain, maintaining a similar logical trajectory to earlier such attempts by developing established techniques of using smaller canals to capture and channel water from distant *iishana* and pans, and more generally capturing the south-flowing flood waters of the central *iishana* network. While the canal extended logically from an earlier infrastructural trajectory or layer, it also however overflowed it and dissolved its ordering of things. The earlier order held the canal as a root to the main body of the dam, extending from the body to bring water to it. In the new layer the canal took centre stage as the main body while the dams took a more auxiliary role to it. It acted more like a stem from whence branches could grow.

The metamorphosis of the canal from root to body was an intensification of the process of centralising the water infrastructure in Ovamboland. While the earlier efforts at centralising and totalising the system focused on creating an interdependent and integrated network of storage and catchment, they remained dependent on rain and flood water. Making the system dependent on water from the Kunene River which could be regulated and controlled allowed for yet more centralised control and allowed for extensive centralised planning and coordination. From the outset the canal was planned to shift the order of things, however the manner of the shift was never certain. As the

1968 Masterplan admitted: “the canal will require a number of improvements to bring it up to an acceptable standard for its future combined function of flood water collecting and conveying Kunene River water. Whether the former function should gradually be dispensed with is still being studied, but it is quite clear that future growth of townships along the route of the canal will demand ever increasing quantities of Cunene water and during extreme drought will be wholly dependent on it.”<sup>174</sup>

#### **‘PERMANENT WATER’ AND HYDRO-ELECTRIC POWER: FOREGROUNDING THE FUTURE**

Proposals for future schemes must necessarily take into account the successful development of supplies in the past, but at the outset and in view of the volume of water needed, it is to be emphasized that dependence on local sources as permanent supplies (with the exception of boreholes) cannot be countenanced. ... It is recognized by all concerned that bringing in Kunene River water (by pumping at Calueque, earlier known as Eriksonsdrift) is the most urgent part of the scheme for supplying Ovamboland with its needs for man and beast, as well as initial irrigation.<sup>175</sup>

The ultimate development of Ovamboland to a self-supporting economy is dependent on many factors but the provision of water services in sufficient quantity and security is of paramount importance. Dependable supplies are the only means of bringing about production on a sustained basis in all sectors of the economy.<sup>176</sup>

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<sup>174</sup> *Ibid*, 60.

<sup>175</sup> *Ibid*, 48-49.

<sup>176</sup> *Ibid*, 74.

By 1968 the third stage of the canal scheme was still in its planning stages and the canals still relied on flood water. The plans for the Mahanene-Olushandja Canal section had actually been completed and tenders had been invited for its construction, but the start of construction had to wait for final approval for the construction of dams and pumping works across the border.<sup>177</sup> In its early planning stages in 1961, a weir was to be constructed in the Kunene River at Calueque 4.5 miles from the border to form a storage dam. Water was to be diverted from the dam to Olushandja Oshana which reached the border and from there the water was to be pumped into the Etaka and Okatana canals. The canals were to be extended by 25 and 13 miles respectively to reach the Olushandja Oshana. It was planned that initially diesel-electric pumping plants would be used, which would be replaced at a later stage by hydro-electric power from the nearby Ruacana Falls.<sup>178</sup> By 1968, the scheme to pump water from the Kunene River was being thought of as a national scheme that could supply water to the rest of SWA. As such the section of canal from Mahanene to the outlet end of the Olushandja siphon was to form part of a State Water Scheme and would be constructed from loan funds as an Odendaal project for which the SWA Administration assumed responsibility.<sup>179</sup> The rest of the canal scheme was the financial responsibility of the Department of Bantu Administration and Development.<sup>180</sup>

The prospect of the canals being supplied with pumped water from the Kunene River allowed the Water Affairs department to imagine and plan a new total water system for Ovamboland. The majority of the 1968 Masterplan

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<sup>177</sup> *Ibid*, 59.

<sup>178</sup> NAMLIT, Ovamboland Canal Scheme 1961, 7.

<sup>179</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 59.

<sup>180</sup> *Ibid*, 59.

consisted of exactly such imaginations and plans. It was planned to develop the canals so that they could distribute 'permanent' water over a greater area. Initially both canals were to be extended southwards and then, although costly, water from the canals was to be pumped through branches of pipelines. As the important government station at Oshikango lay north of the canal against the gradient, it was planned to lay a 12 inch pipeline 45 km to Oshikango, with smaller pipelines branching to rural storage works along the way.<sup>181</sup> It was also envisioned to lay pipelines off the Okatana canal to supply water to cattle posts up to 10 km away, while extending a branch pipe system from the ends of the canals. From the Etaka Canal it would cover the area south of the Oshana Etaka, and from the Okatana Canal it was to radiate into the dry areas east of Lake Oponono.<sup>182</sup>

The ultimate vision was for the completed canal to form the core supply of water to Ovamboland, acting as two arteries from which pipelines would branch and radiate. In areas where the canal and pipelines could not reach and areas that were less prioritised and the cost of extending by pipeline were therefore considered too high, boreholes, excavation dams, and wells and cisterns were to provide water. Out of financial and pragmatic need the administration planned to

develop local low-cost sources to their utmost, particularly for areas that cannot readily or economically be served from a canal system however wide-tentacled. Also, local sources in certain instances could possibly be adequate for the normal requirements of the particular settlement envisaged. The first consideration then is for successful

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<sup>181</sup> *Ibid*, 66.

<sup>182</sup> *Ibid*.

development of the more-minor localized supplies such as boreholes and oshana diversion and storage works."<sup>183</sup>

Here, again, the state returned to its old script, in the first place claiming boldly to produce something new, something bigger and better, but subsequently mentioning quietly, or often not mentioning, that because of pragmatic and financial reasons, they would make do with whatever works on the ground.

### COMPLEMENTARY DAMS, BOREHOLES AND WELLS

These dams, boreholes and wells were planned and designed as part of a total integrated water infrastructure that would cover the whole area in terms of the established territorialisation:

Experience has shown that local water services can be divided into two distinct types. On the sandy outlying districts in the west and east, except in isolated places, runoff is almost non-existent and supplies can be obtained only through the drilling of boreholes. In the alluvial plain on the other hand boreholes are completely unsuccessful due to the high salinity of the underground water and reliance is entirely on runoff in the oshanas and to the scattered pans."<sup>184</sup>

While the plans to spread permanent water through pipes and canals were territorially limited by a new rubric involving the technical and economic capacities of the pumps, canals and pipelines – the territorialization according to 'local water sources' indicates a continuation from earlier infrastructural regimes.

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<sup>183</sup> *Ibid*, 48-49.

<sup>184</sup> *Ibid*, 49.

Excavation dams outside of the canal system were imagined primarily as a water supply for cattle. As such they were to have a larger capacity of 50 000m<sup>3</sup> and to be located with the furthest grazing 6.2 km away and dams spaced 11 km from each other.<sup>185</sup> In the Masterplan it was calculated that a total of 460 dams would be needed according to this pattern, and that of the existing 320 dams only half would be effective according to the new rubric, leaving 300 dams still to be constructed.<sup>186</sup> Like excavation dams, boreholes were also imagined as a water supply for cattle. They were similarly planned to be a “maximum walking distance from the furthest grazing of 4 km with boreholes 7 km apart”.<sup>187</sup> According to this function and its stipulated grazing requirements, only 70 existing boreholes were considered effective. Having calculated that a total of 620 boreholes would be needed according to this pattern, it was conceived a further 550 would be sunk in the future, with the first 156 to be sunk in the next five years.<sup>188</sup>

Unlike boreholes and dams, wells and cisterns that were fed from surface runoff water were planned to supply water for rural schools and clinics. In 1968 they were already being used to supply water to rural schools and clinics, but received little attention in the Masterplan, which merely stated that new rural services were likely be established and so an estimated 60 wells and 140 cisterns were therefore contemplated.<sup>189</sup> As with excavation dams, official publications tended to hide this layer of water infrastructure, which

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<sup>185</sup> *Ibid*, 53.

<sup>186</sup> *Ibid*.

<sup>187</sup> *Ibid*, 50.

<sup>188</sup> *Ibid*, 51.

<sup>189</sup> *Ibid*, 55.

continued to be constructed by local people and consistently constituted a central and prevalent infrastructure for rural inhabitants.<sup>190</sup>

### THE PLANNED ECONOMY

The prospect of regulating and controlling a permanent flow of water through an integrated and centralised water infrastructure excited the managerial imaginations of colonial officials and technical experts, allowing them to plan a complete economy for Ovamboland. Here the technical officials elaborated the developmental content that was absent in the initial conception of the canal. The Masterplan expressed the need for “conversion from an almost wholly subsistence economy to a reasonably high proportion of monetary or exchange economy”.<sup>191</sup> They envisioned that migrant labour should continue to be central to earning cash, consisting of 25% of the population, but that another 25% of the population should be ‘absorbed’ into the urban exchange economy.<sup>192</sup> It planned for mass urbanisation and the establishment of many more hospitals, clinics, schools and an agricultural college.<sup>193</sup> It planned for industrial expansion in the form of furniture factories, meat canning factories, tanning and leather factories, clothing manufacturers, and brick-manufacturing.<sup>194</sup> In terms of urbanisation, it was planned that with adequate

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<sup>190</sup> As evidenced by the 1991 census that “found that only 24% of Ovamboland’s 100,000 households relied on piped water; a mere 9% drew water from boreholes, and 8% obtained water from the canals. The remainder relied on water holes and wells.” in Kreike, “Architects of Nature”, 195.

<sup>191</sup> SWAA. WAT 1921-1970. Printed Reports. Storage Unit 167. Ovamboland Master Water Plan 1968, 21.

<sup>192</sup> *Ibid*, 23.

<sup>193</sup> *Ibid*, 21-22.

<sup>194</sup> *Ibid*, 22

supplies of water, administrative centres for ethnic groups could grow into cities containing 25% of the population.<sup>195</sup>

In relation to agriculture, they envisioned expansive irrigation projects which were regarded as a “salient feature in creating a self-supporting economy for Ovamboland”.<sup>196</sup> Agriculture was considered in terms of water needs per hectare with a calculated limitation that no more than 100 000 hectare could be cultivated continuously.<sup>197</sup> In relation to cattle they claimed Ovamboland was overstocked, and suggested that the government should provide water supplies for cattle in outlying zones where grazing has not been fully exploited due to the lack of water there.<sup>198</sup> Cattle were referred to as units with average drinking requirements of 25m<sup>3</sup> a year per head, and were calculated that they should be limited to 600 000 large stock units.<sup>199</sup>

In these grand economic plans, people, land and cattle were discussed as abstracted quantities and percentiles. There was a clear shift in the discursive rules. In the previous discursive formation, water infrastructures in Ovamboland were posited in terms of a certain local specificity, an effect created by acknowledgements of particular seasonal cattle migration routes, allusions to proper names of elites or communities, references to peculiarities of the environment and the weather in relation to agriculture. Those discourses were centred around a concept of ‘tribe’, whereas the new economic discourse was conjured around a concept of ‘population’. In these aggregate-driven plans, the relationship of the population, cattle and land to the water infrastructure, the particularities on the ground, could be easily

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<sup>195</sup> *Ibid*, 27.

<sup>196</sup> *Ibid*, 48.

<sup>197</sup> *Ibid*, 74.

<sup>198</sup> *Ibid*, 24.

<sup>199</sup> *Ibid*, 43.

ignored, as the locus of discursive struggle was now shifted to the control of the supply of water, of 'permanent water'.

The plans for a total economy for Ovamboland based on a future permanent supply of water necessarily included calculations for an expected future supply of electricity. In the first instance, the pumping of the Kunene river water through the canals and pipelines was planned to be powered by electricity provided by hydro-electric generators at Rua Cana Falls. Secondly, the plans for pumped irrigation schemes, urban industrial production, and facilities like schools, clinics and hospitals – all relied on the provision of cheap electricity from the Kunene River.

These technical plans for development based on hydro-electric power echoed the rhetoric of high-up South African officials. In a 1963 memorandum submitted to the Portuguese delegation as part of the negotiations between the government of RSA and Portugal towards a new agreement regarding the Kunene River, the development and independent rule of Ovamboland were represented as being dependent on supplies of permanent water and hydro-electric power. In the memorandum the RSA officials claimed that Ovambo peoples' "demands for high schools, better craftsmanship and technical training have become increasingly insistent and it is the desire of the government of RSA to assist in meeting these demands as quickly as possible in order to train the Ovambos as quickly as possible to take over as much responsibility as possible in running their own affairs and to become a viable economy."<sup>200</sup> They claimed that this would only be possible through urbanisation, which in turn required water and electricity.<sup>201</sup>

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<sup>200</sup> SWAA. WAT 1921-1970. Dams – Kunene River. 1927-1963, Memorandum on the Possibility of Supplying Electricity from Matala to South West Africa as Part of an

The vast majority of the electricity was intended for the rest of SWA. Indeed, the generation of hydro-electric power was imagined as the centre-piece of the state's plans to develop SWA as a whole in terms of a national economy. As a mouthpiece for the state, the 1964 Odendaal Commission phrased it thus: 'The Commission sees the generation of electricity on the Kunene ... as the most important contribution the State could make towards the further economic development of SWA.'<sup>202</sup> It was planned that initially SWA would purchase electricity from the Angolan Matala scheme for the pumping of water in the canal scheme, and for use in the Tsumeb mines and industries further south. For this a 220 kilovolt power line was to be laid from Matala through Rua Cana to Tsumeb.<sup>203</sup> Electricity from Rua Cana was expected to further supply the industrial centres of Windhoek and Walvis Bay and phase out the supplies purchased from Matala.<sup>204</sup> It was proposed that Escom would operate the Ruacana Power Station and the distribution of electricity.<sup>205</sup> The Ruacana Power Station was to be funded by loans from the RSA government, who also agreed to fund the increase in storage and generating capacity of the Matala scheme in Angola as part of the deal.<sup>206</sup> The collaboration between the

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Efficient Interconnected Grid. Submitted to Portuguese delegation at the start of the morning session on 6 May 1963.

<sup>201</sup> *Ibid.*

<sup>202</sup> Gordon Lawrie, "New Light on South West Africa: Some Extracts and Comments on the Odendaal Report", *African Studies*, 23: 3-4 (1964), 8.

<sup>203</sup> *Ibid.*, 10.

<sup>204</sup> SWAA. WAT 1921-1970. Dams – Kunene River. 1927-1963, Memorandum on the Possibility of Supplying Electricity from Matala to South West Africa as Part of an Efficient Interconnected Grid. Submitted to Portuguese delegation at the start of the morning session on 6 May 1963.

<sup>205</sup> Lawrie, "New Light on South West Africa", 9.

<sup>206</sup> 1964 Agreement Between Portugal and RSA.

governments was framed as an effort at making the most ‘economic’ and ‘profitable’ use of Kunene river water.<sup>207</sup>

This economic and national approach to the river was sanctified in the 1964 official ‘Second Water Use Agreement’ between the governments of RSA and Portugal. In the first section titled “I. Rivers of Mutual Interest”, it stated that the agreement was “in order to promote the rational development of the water resources of the river basins which have a mutual interest for both states”. The agreement laid down an outline for technical and economic collaboration between the governments for the diversion and pumping of Cunene River water, the improvements to the Matala scheme, and the generation of hydro-electric power at Ruacana falls.

The major canals that were designed to carry pumped ‘permanent water’ continued along a logic of earlier water infrastructure, but then inverted it. Originally designed to draw in surrounding flows of water, the canal later became the source of water flows for surrounding areas. As the body, rather than the root, it became a much more centralised infrastructure. The major canal scheme was legally, technically and ritualistically connected to the hydro-power scheme, which was planned in tandem with it.

Hydro-electric power generation and pumped ‘permanent water’ from the Kunene River revealed different layers of development. Initially, they were conceived from a distance as a type of development that was characterised more by its form than content and prioritised as a performance of the state. Later, through the calculated planning of technical officials they developed

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<sup>207</sup> SWAA. WAT 1921-1970. Dams – Kunene River. 1927-1963, Memorandum on the Possibility of Supplying Electricity from Matala to South West Africa as Part of an Efficient Interconnected Grid. Submitted to Portuguese delegation at the start of the morning session on 6 May 1963.

more of a developmental content that referred to specific functions and outcomes. In relation to the canal, the form of development preceded the content, which was later filled-in in relation to the form of the canal.

The abundant energy provided by the canals and hydro-electric power, was imagined by state officials as a total reset, flattening seasonal fluctuations. The canal and hydro-electric infrastructure, however, still necessarily had to fit into what had come before. In the first place, its legal and technical parameters had been shaped by earlier agreements from 1926, which had been established based on the particular technical parameters of that time. It remained primarily concerned with the same question of overpopulation of people and cattle as previous infrastructures, and was shaped by the same material environmental constraints. The centres prioritised in relation to these infrastructures had also been established prior in relation to other infrastructures, and so the canal and electric infrastructure nested itself in this original network. The canal system also plugged into and fed older dams conceived before it, and the cleaning and maintenance of the canal became a form of famine-relief work. In the end, the state still continued to produce a layer of infrastructure from before, a layer that relied on 'local water sources', where the pumped water could not reach. This consisted of the wells, dams, waterholes and boreholes from the earlier chapters.

#### **APPLICATIONS FROM WATER DIVINERS, 1950-1961**

It is not a matter of small irony that the state, at its height of confident self-representation as a rational modern entity, almost unknowingly adopted the behaviour of the irrational other from which it had so fervently attempted to distance itself. From 1950, the administration received further offers from

water diviners and again rejected them, but with a new rationale. The officials explained to the water diviners that the administration only employed scientifically sound geological principles to locate underground water for boreholes:

The selection of boreholes on scientific principles by the best qualified geologists, is considered the only sound procedure. Even in areas where the only scientific analysis is deficient at first, the scientists gain experience and there is constant improvement and valuable records are built up.<sup>208</sup>

By 1961, the official response to water divining from state technocrats had grown frustrated and tired. That year, a Mr Idle offered his water divining services directly to the highest authority of the administration – the Chairman of the Executive Committee for SWA – in a convincingly formal and professional letter.<sup>209</sup> The letter was taken very seriously by this uppermost official, who subsequently forwarded it to the Water Affairs branch for comment. To their annoyance and surprise, these technocrats had to take seriously this application, and provide a report to the Executive Committee explaining their rejection of the water diviner.<sup>210</sup>

The report included a list of all the application the administration had received from water diviners since 1929 and either a brief account of their

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<sup>208</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Letter from Mr Idle to Mr Wipplinger, and reply from Mr Wipplinger on 02.08.1961.

<sup>209</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Letter from Mr Idle to The Chairman, Executive Committee, SWA Administration, Windhoek on 06.11.1961

<sup>210</sup> SWAA, WAT 1921-1970, Boring – Water Divining. 1929-1965. Storage Unit 21. File no. W.W. 52 – 7, Report by Wipplinger, Director of Water Affairs SWA for the Administrator in Executive Committee on 02.12.1961.

experiences in testing them, or more often simply their reasons given for rejecting them.<sup>211</sup> The report also provided motivations from the Water Affairs officials H. Martin and O. Wipplinger for rejecting Mr Idle's application. Martin emphasised that water diviners have much to gain and little to lose from such proposed deals, and that Mr Idle's prior knowledge of borehole depths in SWA would allow him to use this information to estimate water depths and strengths, and would not really test his purported abilities. Martin therefore suggested that if he be given a trial, it should be done by the Geological Survey in Pretoria, where he would not have any prior knowledge of existing boreholes to rely on.<sup>212</sup> While Martin claimed that Idle's use of prior experience and knowledge of an area undermined the credentials of his method, the other expert Wipplinger claimed that knowledge accumulated from prior experience is exactly what made the scientific method more reliable than the water diviners: "Even in areas where the only scientific analysis is deficient at first, the scientists gain experience and there is constant improvement and valuable records are built up."<sup>213</sup> Both Water Affairs officials claimed that giving a water diviner the opportunity of a trial would create a precedent and spark a flood of similar requests, while giving the 'wrong impression' to the public that would encourage them to make use of the services of water diviners, who were not properly qualified according to the policy of the administration.<sup>214</sup>

In the end, the water diviner was not tested by the Water Affairs department, but he did manage to test the distinctly rational identity of the state, showing its epistemologically contaminated nature through its internalised reproduction of the irrational other.

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<sup>211</sup> *Ibid.*

<sup>212</sup> *Ibid.*

<sup>213</sup> *Ibid.*

<sup>214</sup> *Ibid.*

## Conclusion

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The Department of Water Affairs' renewed interest in water divining in 1961 was not an anomaly. In this time when the state most emphasised its modernist technical and logistical approach to water, when it was most obsessed with scientific management – the irrational returns again in a strange and ironic interest in rainmaking. This thesis began with the state's representation and denunciation of native rainmaking, and ends now with the state's own rainmaking.

The official archive shows that from 1954 to 1962, the SWA state officials took an interest in methods of producing rain using silver iodide. Officials in the Department of Works, and later the Department of Water Affairs, collected reports of experiments conducted in other countries, and corresponded with private companies and local farmers who attempted to make rain by 'seeding' clouds with silver iodide.

In a letter to the Secretary for SWA from the Director of Works in 1954, the DoW noted that private farmers in SWA were prepared to pay for a Mr. Bartanne to release silver iodide from an aeroplane into 'ripe' clouds on their farms to induce rainfall.<sup>1</sup> The DoW claimed that the method could be useful to the state in order to increase rainfall for dams that did not receive sufficient rainfall, and that according to the government policy of financially assisting

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<sup>1</sup> SWAA, WAT 1921-1970, Meteorology – Artificial Rainmaking. 1953-1965. Storage Unit 42. File no. W.W.58 – 2, Letter from O. Wipplinger, Director of Works to Secretary for SWA on 19.02.1954.

farmers they were obliged to financially contribute to the farmers costs in the endeavour.<sup>2</sup>

To ensure some form of return for the money invested I suggest that Mr. Bartanne be asked to report fully at the end of the rainy season what method he employed, what he expected to achieve and what actually has been achieved. He should comment on the suggestion to locate silver iodide generators on the ground in order to cut down costs. A questionnaire to be answered by him should be prepared in consultation with the Weather Buro and the Industrial and Scientific research Council.<sup>3</sup>

The letter from the DoW referred to similar experiments conducted in the USA and South Africa that gave divergent views, and attached several articles on it.

In response, the Secretary for SWA informed Wipplinger in 1955 that “after thorough investigation and consideration the Administration is not prepared to grant any financial assistance” and that if the Works Department wished to investigate the matter further, “reports on experiments must be submitted for consultation with the Scientific and Industrial Research Institute.”<sup>4</sup> The state officials in the Water Affairs department however maintained their interest in artificial rainmaking – continuing to collect newspaper clippings, academic articles and books about rainmaking in South Africa, Australia and America from 1957 to 1962.<sup>5</sup> By the end of 1960, Wipplinger produced a report on his research into artificial rainmaking, which reluctantly and somewhat

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<sup>2</sup> *Ibid.*

<sup>3</sup> *Ibid.*

<sup>4</sup> SWAA, WAT 1921-1970, Meteorology – Artificial Rainmaking. 1953-1965. Storage Unit 42. File no. W.W.58 – 2, Letter from the Secretary for SWA to DoW on 08.01.1955.

<sup>5</sup> SWAA, WAT 1921-1970, Meteorology – Artificial Rainmaking. 1953-1965. Storage Unit 42. File no. W.W.58 – 2, Study by Dr. Joachim Seegert in Afrikaans and German on 07.07.1957, Research Paper titled ‘Cloud Physics research in South Africa’ in *Journal of South African Journal of Science* Vol. 53, No. 11, June 1957, 293-297. By Mossop and Carte, Afrikaans and German newspaper articles and farmers monthlies about artificial rainmaking in SWA in 07.1959.

disappointedly concluded that “SWA does not even control its own Meteorological service. It is obviously the best to stand back as far as Rain Making Research is concerned.”<sup>6</sup>

While state officials followed scientific developments from a distance, white SWA farmers on the ground made efforts to engage foreign private rainmaking companies. These developments were closely, maybe even enviously, watched and recorded by state officials. For instance in 1960 the farmer Erich Beckert contacted a Paris-based company to assess the feasibility and economic profitability of developing a cloud-seeding program in his area.<sup>7</sup> The programme was deemed unfeasible by the company, but state officials still recorded and stored all the affiliated documents and correspondence.<sup>8</sup> In 1961 state officials took a renewed active interest in rainmaking, as SWA farmers purchased the entire stock of rainmaking rockets from a local company that had imported 2000 such rockets manufactured in Switzerland.<sup>9</sup> The rockets were to be shot into clouds where they would release silver iodide, which would induce rainfall. The DoW reported the following to the Chief Hydrologist in Pretoria:

The firm states that the higher the cloud the more distant may be the area where rain actually falls. In general the firm claims a certain amount of experience has to be gained by farmers. The first one to three rockets usually serve to gain experience regarding the nature, speed and height of clouds, taking winds into consideration as well.

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<sup>6</sup> SWAA, WAT 1921-1970, Meteorology – Artificial Rainmaking. 1953-1965. Storage Unit 42. File no. W.W.58 – 2, Report by O. Wipplinger on Artificial Rainmaking 09.12.1960.

<sup>7</sup> SWAA, WAT 1921-1970, Meteorology – Artificial Rainmaking. 1953-1965. Storage Unit 42. File no. W.W.58 – 2, Copy of a Letter from John H. Simone, Director for Europe and Africa, Paris to Mr. Erich Beckert, Farm Gelwater, SWA on 24.03.1960.

<sup>8</sup> *Ibid.*

<sup>9</sup> SWAA, WAT 1921-1970, Meteorology – Artificial Rainmaking. 1953-1965. Storage Unit 42. File no. W.W.58 – 2, Letter from O. Wipplinger to Chief Hydrologist, Pretoria on 07.06.1961.

Farmers are supplied with a guide based on the firm's own experience obtained from own experiments and farmers reports.<sup>10</sup>

The Chief Hydrologist in Pretoria heard about the rockets through the media and wrote to Wipplinger asking if the Department of Water Affairs were collecting data on the use of the rockets and whether the media's claims to their success were justified.<sup>11</sup> The firm selling the rockets provided Wipplinger with reports by farmers indicating successful results using the rockets, and he in turn forwarded these to the Chief Hydrologist in Pretoria. In his response, Wipplinger clarified that the rockets were used at the onset of the rainy season and that "the successes may have very little or nothing to do with the rockets."<sup>12</sup> He subsequently noted that the SWA administration had no program of collecting data or experimenting themselves with the rockets as it would "just waste time of officials for important work."<sup>13</sup>

The firm that imported the rockets also offered their services to the state directly, claiming they could help them fill their largest dams.<sup>14</sup> Wipplinger responded thus:

Although I am not at all convinced by the evidence submitted, that your rockets can produce appreciable volumes of rain, legal complications may nevertheless arise. I cannot therefore give my permission for the proposed rocket firing. On the contrary I must warn you that in my opinion legal claims will sooner or later be made

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<sup>10</sup> *Ibid.*

<sup>11</sup> SWAA, WAT 1921-1970, Meteorology – Artificial Rainmaking. 1953-1965. Storage Unit 42. File no. W.W.58 – 2, Letter from Chief Hydrologist to O. Wipplinger, Department of Water Affairs on 03.05.1961.

<sup>12</sup> SWAA, WAT 1921-1970, Meteorology – Artificial Rainmaking. 1953-1965. Storage Unit 42. File no. W.W.58 – 2, Letter from O. Wipplinger to Chief Hydrologist, Pretoria on 07.06.1961.

<sup>13</sup> *Ibid.*

<sup>14</sup> SWAA, WAT 1921-1970, Meteorology – Artificial Rainmaking. 1953-1965. Storage Unit 42. File no. W.W.58 – 2, Handwritten report by O. Wipplinger on Rain Rockets of the company Rudolf Schuster on 08.02.1962.

against persons firing rockets especially in areas where flood damage is a possibility.<sup>15</sup>

This confused and contradictory statement is brimming with uncertainty. Wipplinger's staunch and aggressive disavowal of the rockets appears almost exaggerated as if driven by guilt and shame.

Despite his dismissive criticisms, Wipplinger did however produce a long report on the rockets, which continued to be widely used by farmers in 1962. The Department of Water Affairs collected testimonies from a dozen farms and sent their expert Stengel to observe an experiment:

Mr Stengel was present at rocket experiments on Dr Leitner's farm. He was not at all impressed by the objectiveness of observations. The farmer fired rockets into clouds already raining and after a while came to the conclusion that the rain had increased in intensity due to the rocket. Mr Stengel's opinion was that even the increase in intensity was questionable in this instance, quite apart from the reason for the increase.<sup>16</sup>

As with their recent affair with water divining, state officials performed a seemingly conclusive rejection of the irrational rainmaking practice, disavowing their own approaches in the relationship. But the irrational is not something outside the state that it resists, it is what the state identity is constructed on; it is a necessary and unstable part of the state that is born out of and then repressed in the performance of a stable binary of the rational and irrational.

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<sup>15</sup> SWAA, WAT 1921-1970, Meteorology – Artificial Rainmaking. 1953-1965. Storage Unit 42. File no. W.W.58 – 2, Letter from O. Wipplinger to the rocket company Rudolf Schuster Ltd., Windhoek on 05.02.1962.

<sup>16</sup> SWAA, WAT 1921-1970, Meteorology – Artificial Rainmaking. 1953-1965. Storage Unit 42. File no. W.W.58 – 2, Handwritten report by O. Wipplinger on Rain Rockets of the company Rudolf Schuster on 08.02.1962.

While colonial officials considered indigenous rainmaking practices and beliefs to be evidence of the irrationality and otherness of the native, and to be of no use to the colonial state, they treated rainmaking by Europeans differently. Despite a lack of incontrovertible scientific evidence to support rainmaking practices that seeded clouds with silver iodide, and fired silver iodide rockets into clouds, state officials were compelled to investigate and experiment with these methods. Despite similar success rates to indigenous rainmaking practices, state technocrats convinced themselves that these rainmaking practices were indeed scientific, but had just not yet acquired that fully scientific status. As such, they were considered potentially useful to the state and became a concern of the Department of Works and later the Department of Water Affairs. In this ambiguous epistemological status as both belonging and not yet belonging to science, these rainmaking practices were eventually rejected by state officials, but not without hesitation or reservation. The contradictory reasoning offered in their official correspondence is indicative of the state's efforts to maintain a semblance of rationality, coherence and totality, when the opposite was simultaneously the case. The communications between officials conveyed a sense of ambiguity, frustration and embarrassment, as if denying and repressing something – a belief, or a yearning maybe, for some magic.

In this thesis, I have traced a broad shift in the way the colonial state approached water in Ovamboland. In the earlier stages there was a clear and prevalent integration of indigenous practices and knowledge by state officials in their efforts to produce water infrastructure. After the establishment of the Water Affairs department in 1954, however, state officials adopted a more centralised approach with more pretence of distance and more confidence in a top-down process in the production of water infrastructure. But such a straightforward telling of history according to policies and intentions is

fanciful and does not tell a very useful or accurate story, as it misses the manifold causalities at play in the layered materialities and infrastructures of water. By foregrounding multiple connections to older infrastructural concerns, techniques and knowledge, I have attempted to show how this later approach was not actually as separate, distinct or new as portrayed by officials. In order for this more centralised infrastructure to be operational, it necessarily relied on and adapted to earlier approaches, which simultaneously continued beside and within it. The state's renewed interest in rainmaking enacts a similar sort of *déjà-vu* moment as those multiple messy connections that draw the new back into the old. In order to make the infrastructure most effective, these officials unknowingly returned to older 'irrational' knowledges and practices. In the very moment when they thought they were doing something new, they re-enacted a practice of rainmaking that they thought had already been successfully surpassed. Here, again, the traces of the old layers continued to mark the new in order for the new to operate. This return to the previously excluded undermines the performance of a distinct new Apartheid developmental state and haunts it by revealing its own epistemological incoherency, multiplicity and otherness.

Most histories have represented water infrastructure in Ovamboland as a product of the colonial states intentions and as a reflection of its policies. This thesis showed that the material infrastructure was not simply realised from a priori knowledge and policy, but instead was developed at multiple levels engaging the expertise and knowledge of people on the ground and in between. Beyond the human, this thesis aimed to show how the conceptualisation and realisation of infrastructure was also conditioned by certain materialities of water and sand, and particular networks of social, economic and political practices already at play. In an effort to complicate the relationship between, and separation of, knowledge and practice, and the

imagined and the real – I showed some ways that infrastructure in turn shaped governmental policies and plans. By looking carefully at how water was stored in the dry pages of the colonial archive, I tried to show that the act of recording water in particular ways was related to the seasonality of water, and how the production of dam and well infrastructure from 1929 in turn shaped how water was recorded and reported on. I showed how the form of monthly colonial reports compiled by the Native Commissioner from 1927 collated sections on labour, water, cattle, crops and rainfall in a way that allowed officials to think of them as causally linked. I proposed that the connections between the recorded changes in these categories then produced the imaginary object of ‘seasonality’, in relation to which wells, dams and the Trust Fund System infrastructure were employed to manage and control. I showed that the construction of the major canals from 1959 then produced a change in the reported conceptualisation of water as ‘permanent water’, which allowed for the imaginary object of a planned totalised economy.

This thesis has been limited to water infrastructure in which colonial officials were in some way or another involved. Most water infrastructure used by people in Ovamboland lies outside its scope, as that infrastructure consists of small localised wells and waterholes which continued to provide most people with water for themselves and their livestock. This limitation of the work has also however provided an opportunity. By focusing on a single archive, I have been forced to show how ‘one side’ contains both, how the colonial and native were inextricably entangled. An infrastructural approach to this history presented a chronology defined by the infrastructural regimes themselves, which does not neatly accord with political timeframes and places in question their autocratic dominance.

The first chapter showed how from 1920 borehole technology was employed to lubricate the flow of male labourers south to the colonial economy. Borehole technology however proved too cumbersome and expensive to operate in the soft salty sand in the absence of sufficient supplies of surface water. With the failure of boreholes, well infrastructure was extended eastwards by colonial officials, headmen and local well-diggers from 1927 by engaging older political, social and economic assemblages. This well infrastructure allowed for the settlement of many more people and cattle in the east, and with the introduction of the Tribal Trust Fund system in 1929, it became nested in the grain and cash economies. The grain and cash taxes collected from households were used to pay for the construction of these wells, the production of which reorganised the connections between agricultural and migrant labour in relation to new political institutions.

The second chapter explored a layer of dam infrastructure produced as a form of famine-relief work starting in 1929. As a form of famine relief where 'able-bodied' men were excluded, the production of this dam infrastructure established new relations between money, grain and labour, and the social and political identities those relations defined. The chapter then looked at the Trust Fund system as a financial infrastructure that connected well and dam infrastructure and embedded them in the material practices of agriculture and migrant labour. It proposed that this financial infrastructure outlined and connected a colonial and a 'tribal' economy, defining them in relation to cash and grain respectively. According to the logic of this system, wells and dams were employed to flatten the seasonal fluctuations that interfered with agricultural production and consequently disrupted migrant labour.

The third chapter described how a new more centralised layer of water infrastructure was being planned and constructed from 1947, but was still

conditioned by and embedded in the older layers of infrastructure. This infrastructure was funded by central government funds rather than the Tribal Trust Funds, and became intimately tied to a performance of development. The older layers of well and dam infrastructure however continued with and beside it. The chapter argues that the major canal and hydro-electric power infrastructure led to a more intense developmentalist approach by the state, which allowed for an excited totalised planning of the economy. In this infrastructure water, electricity and human labour were considered as different forms of energy in the employ of the national economy, and the planned infrastructure for Ovamboland reflected this. Like the earlier wells and dams, this infrastructure was employed to separate and attend to different spheres of economic life: boreholes and small excavation dams in rural areas were to support cattle, large dams connected to the major canals were to allow for large scale crop irrigation, to facilitate the operation of industrial production at urban centres, and provide large urban populations, hospitals and schools with sufficient supplies of clean drinking water.

In all three chapters I have traced out how the colonial state approached different forms of water infrastructure, how it tried to affect the world in particular ways through the production of boreholes, wells, waterholes, dams, canals, roads, pumps and hydro-electric generators. By demonstrating the embeddedness and multiplicity of causes, effects and connections that manifested in the production and use of these infrastructures, I attempted to convey a sense of messiness at odds with any simple explanation based on policy intentions. I put forward the idea that the water infrastructure of Ovamboland is made up of multiple layers which overlap in a palimpsest, where each layer necessarily affects and is affected by the other layers. Through the entangled connections that joined each of these forms of water infrastructure to various social, political, economic, agricultural and cultural

spheres I showed that each layer is made up of complex assemblages of human and non-human networks, where no single element is ever in control. In particular, I have emphasized how infrastructure that has been introduced as new, is necessarily conditioned and directed by the existing infrastructure. In order to operate it is forced to 'fit' in the ways that the older layers of infrastructures allow.

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