

**Circulation and Appropriation of Urban Technologies:  
Drainage and Traffic Infrastructures in Dar es Salaam,  
1913 – 1999**

**at the Department of History and Social Sciences of the  
Technischen Universität Darmstadt**

submitted in fulfilment of the requirements for the degree of Doktor philosophiae  
(Dr. phil.)

**Doctoral thesis  
by Frank Florah Edward**

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ZIRKULATION UND ANEIGNUNG URBANER  
TECHNOLOGIEN. ENTWÄSSERUNGS- UND  
VERKEHRSINFRASTRUKTUREN IN DAR ES SALAAM 1913 –  
1999.

Frank Florah Edward

In der Technischen Universität Darmstadt,  
Darmstadt 2022

### **Erklärung zur Dissertation**

Hiermit versichere ich an Eides statt, dass ich die vorliegende Arbeit selbstständig und nur unter Verwendung der angegebenen Quellen angefertigt habe. Alle wörtlichen und sinngemäßen Entlehnungen sind unter Angabe der Quelle kenntlich gemacht. Die Arbeit wurde bisher weder im In- noch im Ausland in gleicher oder ähnlicher Form einer anderen Prüfungsbehörde vorgelegt.

Darmstadt, den 28.10.2022

Frank Florah Edward

## Abstract

The infrastructure in African cities has been discussed in the media and political discourses for several decades. The main narrative has been about their failures and unreliability. Electricity blackouts, the failure of water supply systems, traffic congestion and poor sanitation systems have been at the centre of the heated discussions about infrastructure. As a result, urban scholars have paid considerable attention to these systems at the expense of others. Problems relating to drainage infrastructure, especially infrastructure malfunctioning and flooding, often go unnoticed and are understudied, although they occur every year. Drainage failures frequently affect traffic infrastructure by damaging roads, causing traffic congestion and, at times, destroying urban transit systems. Weaving research approaches from urban, science and technology studies, this study examines the most historically-urbanised city of Dar es Salaam in Tanzania to understand and explain the drainage problem and its connection to traffic infrastructure. Emphasising the technical and spatial entanglement, the study argues that the contemporary and past drainage and traffic problems are the result of colonial and post-colonial engineering and planning processes and decision-making. This study uses the splintering-urbanism thesis to posit that it was not merely the racial policy that led to the building of separate urban systems, as argued by social and historical studies of urbanisation. The retrieved archival and documentary sources show that medical and class forces as well as the continuity of colonial and early post-colonial infrastructure regimes were also at play in the unfolding of the drainage problem in Dar es Salaam. As such, the study does not only create knowledge on the drainage problem that occurred invariably but also controverts recent accounts which contends that the drainage problem — a problem that manifests through urban floods — is largely a consequence of climate-related changes and the rise of the sea level.

The study demonstrates that, during the colonial and post-colonial periods, the design and distribution of drainage and traffic infrastructure were influenced by local and imperial urban infrastructure circulation and appropriation processes. In particular, the archival and documentary sources reveal that the colonial drainage and traffic systems were an outcome of the colonial technological circulation of certain forms of knowledge, materiality and practices, with limited local appropriation. The study submits that most of the studies on urban infrastructure done in the Global South do not articulate and discuss the context of the infrastructure beginnings in the Global North. With respect to the post-colonial era, the retrieved material indicates that the ill-conceived policy of science and technology, such as the desire to undertake urbanisation through industrialisation without having a critical mass of well-educated people and the appropriation of colonial technical pedagogical structures, led to the failure of the drainage and traffic infrastructure. Along with other socio-economic forces such as the long-term economic crisis that began in the

late 1970s and continued until the 1990s, the non-articulated and disconnected infrastructure regimes and the sheer technical and financial dependence on aid the vulnerability and implications of the drainage and traffic infrastructure were exacerbated by uncontrolled and ever-growing urban sprawl. The study concludes that the past and present drainage and traffic problems in Dar es Salaam are an outcome of historical processes that contemporary technocrats and scholars need to understand so that they can develop comprehensive and tangibly lasting solutions. The processes are technological, cultural, environmental and political – the socio-technical processes that could be understood well if they were studied within their unique temporal-spatial landscape. Such an understanding would help to change the local and international agencies' interventions into, and perspective on, floods, not only in Dar es Salaam but also in other Global South cities.

## Zusammenfassung

Seit vielen Jahrzehnten sind Infrastrukturen afrikanischer Städte Thema medialer und politischer Diskurse, wobei es in erster Linie immer wieder um ihr Versagen und ihre Unzuverlässigkeit geht. Insbesondere Stromausfälle, Engpässe der Wasserversorgungssysteme, Verkehrsstaus und dürftige Sanitärsysteme stehen in den hitzigen Diskussionen zu Infrastruktur an erster Stelle. Dies hat dazu geführt, dass StadtforscherInnen diesen Systemen besondere Beachtung beigemessen haben. Die Probleme der Entwässerungsinfrastruktur wie etwa ihr Überfluten sind hingegen trotz ihrer Häufigkeit weitestgehend unbeachtet geblieben und werden in der Forschung selten berücksichtigt. Das Versagen von Entwässerungssystemen beeinträchtigt aber häufig die Verkehrsinfrastruktur, weil es dadurch zu Verkehrsstörungen kommt, Straßen beschädigt werden und mitunter das städtische Nahverkehrssystem eingeschränkt wird.

Die vorliegende Studie untersucht in diesem Kontext die geschichtsträchtigste Stadt Tansanias, Dar es Salaam, und verbindet Ansätze aus Stadt-, Wissenschafts- und Technikforschung, um das Problem der Entwässerungssysteme und ihre Verflechtung mit der Verkehrsinfrastruktur zu erklären. Unter Hervorhebung ihrer technischen und räumlichen Verflechtung argumentiert diese Arbeit, dass die heutigen und die historischen Entwässerungs- und Verkehrsprobleme eine Folge der kolonialen und postkolonialen Konstruktions-, Planungs- und Entscheidungsprozesse sind. Um dieses Argument zu erläutern, stützt sich die Studie auf die These der „Zersplitterung des Stadtraums“ („splintering urbanism thesis“). Damit soll belegt werden, dass die segregierten urbanen Systeme und Räume nicht lediglich eine Folge der Rassenpolitik sind, wie es soziale und historische Studien zur Urbanisierung nahelegen. Die archivaren und dokumentarischen Quellen zeigen vielmehr, dass medizinische und klassenbezogene Aspekte sowie der Fortbestand (post)kolonialer Infrastrukturordnungen für die Entstehung und Zunahme von Entwässerungsproblemen in Dar es Salaam ausschlaggebend waren. Insofern trägt die Arbeit nicht nur zum Erkenntnisstand über dieses Problem bei, sondern widerlegt auch jüngste Berichte, wonach das Abwasserproblem eine Folge des Klimawandels und des steigenden Meeresspiegels sei.

Die Studie legt dar, dass die Verbreitung und die Gestaltung der Entwässerungs- und Verkehrsinfrastruktur in der kolonialen und postkolonialen Zeit durch Zirkulations- und Aneignungsprozesse beeinflusst wurden. Insbesondere Archiv- und Dokumentarquellen belegen, dass die Entwässerungs- und Verkehrssysteme das Ergebnis der kolonialen Zirkulation von Technik sind, die mit bestimmten Formen des Wissens, der Materialität und der Praktiken einherging und nur eine begrenzte lokale Aneignung und Anpassung erfahren haben. Die Studie zeigt zudem auf, dass die meisten Infrastrukturstudien im Globalen Süden den Kontext der

Vorgängersysteme im Globalen Norden nicht angemessen berücksichtigen und diskutieren. Das Archivmaterial der postkolonialen Phase hebt hervor, dass eine schlecht umgesetzte Wissenschafts- und Technikpolitik unvermeidlich zum Versagen der Entwässerungs- und Verkehrsinfrastruktur führte. Diese schlecht umgesetzte Politik beinhaltete unter anderem den Wunsch nach Urbanisierung durch Industrialisierung ohne eine kritische Masse an gut ausgebildeten Arbeitskräften, sowie die Aneignung kolonialer technisch-pädagogischer Strukturen. Durch andere sozioökonomische Faktoren wie z. B. die lange Wirtschaftskrise der späten 1970er bis in die 1990er-Jahre, die fragmentierte Infrastrukturplanung sowie die technische und finanzielle Abhängigkeit von ausländischer Hilfe, wurden sowohl die Entwässerungs- als auch die Verkehrsinfrastruktur zunehmend ineffizienter und ihre Auswirkungen haben sich durch die unkontrollierte Expansion und Zersiedelung Dar es Salaams ausgeweitet. Die Untersuchung kommt zu dem Schluss, dass die Entwässerungs- und Verkehrsprobleme in Dar es Salaam das Ergebnis historischer Prozesse sind, die Akteure und WissenschaftlerInnen berücksichtigen müssten, um umfassende und nachhaltige Lösungen entwickeln zu können. Diese Prozesse sind technologischer, kultureller, ökologischer und politischer Natur. Solche sozio-technischen Prozesse können am besten innerhalb ihrer einzigartigen zeitlich-räumlichen Landschaft verstanden werden. Ein solches Verständnis kann dazu beitragen, die Perspektive und die Interventionen lokaler und internationaler Akteure zielführend zu verändern, und zwar nicht nur in Dar es Salaam, sondern auch in anderen Städten des Globalen Südens.



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## Orthography

This thesis is written in the English language, although it has been submitted to a German academic institution. Specifically, the thesis is written in British English, except for the quotes that are written in other varieties of the language. The word storm water is spelled storm-water in British English and storm water in American English. The alternatives were maintained in the quotes from both primary and secondary sources. However, there are a few words in the thesis from two other languages: Kiswahili and German. The use of such words is limited to the relevant sections in keeping with the institutional backgrounds and the sources consulted, and in an effort to preserve the original meanings of the words because of their importance. Apart from original document and subtitle italicisation, most other italicised words are from German and Kiswahili. Whenever used for the first time, non-English words are preceded or followed by their English translations. The use of English, Kiswahili and German words is also influenced by the history of Dar es Salaam City, the subject of the study reported in this thesis. The residents of Dar es Salaam use Kiswahili as their formal language in all social circles, politics, elementary levels of education and the media. During the German colonial era (1890-1918), the residents of Dar es Salaam used Kiswahili in social communication and at the lower levels of education for Africans. German was the language of government, education, politics and diplomacy. During the British colonial era (1919-1961), English replaced German as the language of government, secondary and technical education, and diplomacy. Kiswahili was the language of native government, everyday communication and lower levels of native education. Such a diverse and dynamic linguistic history forces researchers to use some words or phrases in their original form to prevent the semantic alteration that might occur in translation.

## **Acronyms**

BL – British Library, United Kingdom

BNA – British National Archive, United Kingdom

CBD – Central Business District

CO – Colonial Office

CZNA – Central Zone National Archives, Dodoma, Tanzania

DMDP – Dar es Salaam Metropolitan Development Project

DMT – Dar es Salaam Motor Transport

DOAG - Deutsch Ostafrikanische Gesellschaft

ERB – Engineers’ Registration Board, Tanzania

ICE – The Institution of Civil Engineers, United Kingdom

IE – Tanzania Institution of Engineers

IME – The Institution of Mechanical Engineers, United Kingdom

ISI – Import Substitution Industries

JMT – Jamhuri ya Muungano wa Tanzania

LEGICO – Legislative Council of Tanganyika

MECCO – Mwananchi Engineering and Construction Corporation

MSSD – Medical and Sanitary Services Department, Tanganyika

NDC – National Development Corporation

PWD – Public Works Department, Tanganyika

SCP – Sustainable Cities Programme

SDP – Sustainable Dar es Salaam Project

SIDO – Small-scale Industrial Development Organisation

SUDP – Sustainable Urban Development Programme

TANU – Tanganyika African National Union

TIPER – Tanzania and Italian Petroleum Refining Company

TNA – Tanzania National Archives

UDA – Usafiri Dar es Salaam

UNDP – United Nations Development Programme

UNEP – United Nations Environmental Programme

UNESCO – United Nations Educational, Scientific and Cultural Organisation

URT – United Republic of Tanzania

WWI – First World War

WWII – Second World War

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The idea that culminated in the research project reported in this thesis was conceived in February 2014 when I was working as an Assistant Lecturer in History at the University of Dar es Salaam. I wanted to develop a local perspective on the transition of East African cities using the lenses of infrastructure. The intention was to add a theoretical value to an interdisciplinary research project, which had begun in October 2014 at the Graduate School of Urban Studies (UrbanGrad) of Darmstadt University of Technology in collaboration with the Goethe Universität, both of which are in Germany. The project was interdisciplinary, and it concentrated on two East African cities, namely Dar es Salaam in Tanzania and Nairobi in Kenya. Credit should go to Professor Dr Jochen Monstadt for his leadership in the initial stages of the project and to his predecessor Professor Dr Mikael Hård. After I joined the project in January-February 2015, Professor Annette Rudolf-Cleff offered me office space at the School of Architecture at TU Darmstadt. I am proud to say that my intellectual development at this level is a product of their efforts, guidance and mentorship.

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Although I was based at the School of Architecture, I was officially enrolled on the Department of History at Darmstadt University of Technology. The Department invited me to attend many seminars and training it organised. I presented my project proposal and shared my progress in the Department through its senior seminar programmes. Through the Department, I attended training in GIS in historical research coordinated by Professor Dr Dieter Schott. This training was very useful as it gave me rudimentary skills needed to use geographical information in historical research that I did not have (especially how to use hidden geographical information and how to make simple maps for illustration purposes). The Department enabled me to grow as a researcher and an academic. I also co-taught an undergraduate course titled “Sources of African History” with Professor Dr Mikael Hård. The Department’s role in teaching mentorship is highly appreciated.

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Frank Edward



*To my aunt Yollanda Mgessi and my uncle Selijo Mgessi;  
And the Banimutwa Lumato lineage of Rungemba.*

# CHAPTER I

## INTRODUCTION

### 1.1 Background of the Problem

On 24<sup>th</sup> March 1930, the privately-owned and middle-class newspaper, *Tanganyika Standard*, carried the following story about Dar es Salaam, the capital of Tanganyika (now Mainland Tanzania):

The showers of the past week left one quarter of the town bright and fresh and gladdened by the beauty of the rain. Just about a mile away, along the sea-front, in the vicinity of the General Post Office and in what is regarded as the commercial area, the waters lay dark and deep. Pedestrians had to paddle through the mud to reach the heart of commercial activity – the Post Office. Motor cars ploughed through mud and water, into pot-holes, and sprayed the dirty water over those who had to walk. In any other town of the size of Dar es Salaam, the Municipal Council would have been called into question long ago regarding efficiency of their administration.<sup>1</sup>

Fifty years later, on 6<sup>th</sup> May 1979, the weekly state newspaper – *Sunday News* – had a headline that read “Downpour Throws Dar into Chaos.” The rains had caused flooding in the city streets, both planned and unplanned streets. It put all aspects of urban life in Dar es Salaam to a halt. In the unplanned settlements of Tandika, Kigogo and Manzese mud houses collapsed, leaving several families homeless. The middle-class planned areas of Mikocheni, Ada and Regent estates were inaccessible by car so that car owners parked their cars elsewhere and walked through flooded roads to their houses. The CBD was isolated from the Magomeni area by the overflowing of the Msimbazi River, which made a section of Morogoro Road impassable. The popular playing fields of Jangwani were completely inundated with water. The industrial estates along Pugu Road were also waterlogged. In the CBD, the streets were flooded with traffic, which was moving very slowly.

Flooding events of this magnitude did not happen for the first time in 1979, nor did they occur occasionally. They occurred on a regular basis, during every rainy season, since the colonial days. The regular frequency was revealed by headings, pictures, editorial features and letters to the editors that appeared in newspapers every year from the 1930s to the recent past. While the damage of houses and other property was occasional, depending on the magnitude of rainfall, the damage of roads, characterised by potholes, traffic jams, accidents and by obstruction of vehicular mobility, assumed a non-sporadic pattern. And as shown in the *Sunday News* and the *Tanganyika Standard* above, the regular floods did not spare the historically most planned and the technologically most favoured area – the CBD. The repeated flooding of traffic infrastructure signalled a technological problem that needed an intervention. The problem was rooted in the storm-water drainage, which was lacking, poor or inappropriate. As the *Tanganyika Standard* above reveals, it was a technological

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<sup>1</sup> “Dar es Salaam Township” in *Tanganyika Standard*, 24.03.1930.

problem whose solution needed to be initiated by the municipal government before being implemented by the spatial planners and civil engineers.

Against the discursive background presented above, this thesis examines the technically and spatially interdependent urban technologies of traffic and storm-water drainage infrastructure in Dar es Salaam using a historical perspective. It seeks to answer the question why flooding events have been persistent and destructive for over a century despite the changing regimes of governance – colonial and post-colonial. Dar es Salaam is a historically loaded city in all aspects of life in Tanzania: it served as a national capital between 1891 and 1973, it harbours the state house and embassies of many nations – or the centre of national politics and diplomacy, it is the commercial and transport capital, and above all, it is the most populous city in Tanzania with about 10% of the country's total population.<sup>2</sup> With this importance and criticality of the city, the traffic infrastructural network was central to the everyday urban life. However, it was prone to flooding. As such, it became the leading urban technology that featured frequently in the media discourse in association with another technology – the drainage infrastructure. The vulnerability of traffic infrastructure has affected both people and the government in different ways. The state is obviously affected financially and policy-wise, especially when restoring (and rehabilitating for) optimal performance of infrastructure.

In African cities, infrastructure has been one of the critical subjects of media and political discourses over time. Invariably, the inherent force behind the heated debate in different arenas has been the unreliability and failures relating to infrastructure. Thus, the stories about infrastructure are predominantly about sordid realities. The most remarkable stories include electricity blackouts, water shortages, traffic congestions, storm-water floods, sanitation-network failures and poor telecommunications connectivity. Unlike in Dar es Salaam, the flooding events on traffic infrastructure are not regular or systemic. They occur only as occasional events of excessive and irregular rainfall. Hence, urban technology experiences related to flooding in Dar es Salaam are historically different from those in other African cities.

Furthermore, the systemic failure of urban traffic infrastructure relating to storm-water drainage in Dar es Salaam, as in many other African cities, has until recently received a very limited and narrow attention from scholars, despite posing serious challenges to the state, users, designers, planners and other local and international actors.<sup>3</sup> Even in the Global North, there are very few works on these issues. The reason is that flooding events that have huge devastating effects are few. The standout work in the Global North is historical research which was not meant to be used

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<sup>2</sup> See the population figures for Dar es Salaam at <https://nbs.go.tz>, accessed on 28.04.2018.

<sup>3</sup> See, for instance, John Abbott, *Green Infrastructures for Sustainable Urban Development in Africa* (London & New York: Earthscan, 2012), 1-7.

as a manual to municipal engineers or spatial planners as most other works that have been published. The work is Andrew Karvonen's *Politics of Urban Runoff*, a work which historicises storm-water drainage in the two US cities of Austin, Texas and Seattle, Washington.<sup>4</sup> Secondly, as the recent trope goes, most of the works on urban drainage and flooding are associated with the impact of climate change.<sup>5</sup> Consequently, the historicity of flood-related traffic failures is conspicuously missing and this makes scholars and policy makers decide to present narratives of climate change. This thesis addresses that lacuna by first discussing the century-long occurrence of flooding in Dar es Salaam. It uses the hypothesis that the century-long flooding events and resultant destruction of traffic infrastructure are partly the upshot of processes associated with spatial planning and civil engineering from the colonial period to the recent past. It examines the role of spatial planning and engineering practices and cultures in the making and development of the flooding problem over time. It also attempts to argue that the technical and spatial interconnectedness between traffic and drainage infrastructure was either missing or circumstantially underplayed in the making of the city master plans and in the building of the traffic infrastructure.

The second hypothesis is that the changing municipal governance regimes played a big role in sustaining flooding in Dar es Salaam in the 20<sup>th</sup> century. Through this hypothesis, the thesis examines the political influence on matters pertaining to traffic and drainage infrastructure. In particular, it identifies and discusses the narratives that influenced political decisions over urban technological matters. Taking inspiration from Judith Lee Powers whose work "The Absence of Conspiracy" examined the role of politics in the provision of water in Los Angeles between 1830 and 1930<sup>6</sup>, this thesis argues that there were changing political narratives on controlling floods, which made floods continue during the colonial to post-colonial urban governance regimes. In so doing, it fills the gap in the present research that presents flooding as a present problem without any connections to the past. Ultimately, this thesis pioneers discussion on the problem of traffic and drainage urban technologies from a historical perspective, not only on Dar es Salaam City but on the whole African continent.

## 1.2 Scope of the Study

This work weaves together histories of technology and urbanisation in an African city context. It uses the case of Dar es Salaam, the most populous city in Tanzania and the second most populous

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<sup>4</sup> Andrew Karvonen, *Politics of Urban Runoff: Nature, Technology and the Sustainable City* (Cambridge and London: The MIT Press, 2011).

<sup>5</sup> See, for instance, Stephan Pauliet et al. eds., *Urban Vulnerability and Climate Change in Africa: A Multidisciplinary Approach* (Heidelberg: Springer, 2015).

<sup>6</sup> Judith Lee Powers, "The Absence of Conspiracy: The Effects of Urban Technology on Public Policy in Los Angeles, 1850-1930" (PhD diss., University of California, 1981).

city after Kinshasa in Eastern, Central and Southern Africa. A detailed overview of the geography, social and political history of Dar es Salaam is given in Chapter II. Conceptually, this work employs concepts that are used in African histories of urbanisation as well as in the history of technology. 'Race', for instance, is common in urban histories of Africa owing to the colonial episode in which relations between the colonial rulers and subjects revolved around issues of ethnicity. In Tanzania, 'race' was a common word in the colonial correspondences, which put all the country's facets into three races: Europeans, Asians and Africans. As such, it is important that the concept of 'race' is not construed by readers as being purposely used to discriminate against any contemporary social group or individuals. Rather, it is used as a descriptive concept within a historical and colonial context. Another rarely used concept is urban technology. This concept is borrowed from Judith Lee Powers' work mentioned earlier. It refers to all the large technical systems in urban areas, particularly roads, gas, the Internet, power, water and drainage.

Chronologically, the work examines flooding events through evolution of drainage and traffic technologies in the period from 1913 when the Germans formally recognised the problem of flooding in Dar es Salaam to the year 1999 when the implementation of the 1979 Master Plan that recognised the problem of flooding ended. This is a period of three different but superimposed regimes: the German, British and post-colonial state. Other periods are included slightly to make what is examined more intelligible and to prove the usefulness of history in understanding the present, just as the historians Mikael Hård and Andrew Jamison contend in their book, *Hubris and Hybrids: A Cultural History of Technology and Science*.<sup>7</sup> As Carroll Pursell further suggests, we have to consider infrastructure as being "part of our material condition" which is "socially constructed for certain purposes." Therefore, when we discuss past issues we have to take into account the existing conditions.<sup>8</sup> In other words, one should not write history that lacks social relevance and context.

### **1.3 State of the Art**

#### *1.3.1 The Large Technical System in Historiography*

Globally, the historiography of urban infrastructure and large technical systems is relatively a recent phenomenon, having begun in the early 1980s. Yet what has been written about infrastructure within that duration speaks volumes. Studying infrastructure using a temporal perspective, regardless of being urban or rural infrastructure, is a vocation of historians of technology. Infrastructure forms a system or network whose development embodies an ensemble of factors

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<sup>7</sup> Mikael Hård and Andrew Jamison, *Hubris and Hybrids: A Cultural History of Technology and Science* (New York and London: Routledge, 2005), 293-4; Cf. R.F. Atkinson, *Knowledge and Explanation in History* (London and Basingstoke: Macmillan, 1978) on subject matter of history.

<sup>8</sup> Carroll Pursell, *The Machine in America* (Baltimore: John Hopkins University Press, 2007), xii, 1.

and actors like technology, a spatial dimension, science, politics, economy and society. However, in the earlier accounts on the history of technology, such an understanding was downplayed. The accounts focused on inventions and discoveries, and paid enormous attention to machines and the great men associated with the discoveries and innovations.<sup>9</sup> Historians of technology seldom avoid acknowledging the influence of Thomas P Hughes' *Networks of Power* in encouraging them to look beyond traditional issues in the history of technology such as inventions and discoveries.<sup>10</sup> Inspired by Hughes, historians and social scientists started looking at social, organisational and cultural issues in connection to large technical systems with new vigour and determination.<sup>11</sup>

The large technical systems include systems of electricity, water supply, transit, railways, ports, storm-water drainage, sanitation, telephones, the Internet, surveillance, telegrams, gas and airports. Publications on the technical systems are plenty. The authors focus on their rise and development, circulation and appropriation, production and distribution, use and tinkering, repair and maintenance, their connection to major events like wars and hazards, their impact on societies, economies and politics as well as their criticalities and vulnerabilities. Surely, certain themes have dominated research in certain historical moments because of certain contemporaneous events. In the recent research on infrastructure, for instance, most works discuss themes of vulnerability, criticality and preparedness against security challenges, terrorism and natural hazards such as earthquakes, floods and climate change.<sup>12</sup>

Region-wise, a survey of the existing literature indicates that scholars have predominantly been preoccupied with the modern large technical systems found in the Global North (North America and Europe)<sup>13</sup> and occasionally with those found in the newly industrialising countries like India and Argentina.<sup>14</sup> Locations in the Global South receive little scholarly attention: they are understudied. This can partly be associated with the fact that modern technology is enmeshed within the hegemonic global capitalist system whose centre is in the Global North. To the

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<sup>9</sup> Timo Myllyntaus, "The History of Technology in Finland", *SHOT Newsletter* 70 (Jan. 1996).

<sup>10</sup> Thomas P. Hughes, *Networks of Power: Electrification of Western Society 1880-1930* (Baltimore: John Hopkins University Press, 1983).

<sup>11</sup> Olivier Coutard and Simon Guy, "STS and the City Politics and Practices of Hope," *Science, Technology and Human Values* 32, no. 6 (2007), 713-734; Renate Mayntz and Thomas P. Hughes eds., *The Development of Large Technical Systems* (Colorado: Westview Press, 1988).

<sup>12</sup> See Per Högselius et al. eds., *The Making of Europe's Critical Infrastructure: Common Connections and Shared Vulnerabilities* (New York and Basingstoke: Palgrave Macmillan, 2013); Anique Hommels et al. eds., *Vulnerability in Technological Cultures* (Cambridge, MA & London: The MIT Press, 2014); Jens Ivo Engels ed., *Key Concepts for Critical Infrastructure Research* (Wiesbaden: Springer VS, 2018); Stephen J. Collier and Andrew Lakoff, *The Government of Emergency: Vital Systems, Expertise and the Politics of Security* (Princeton: Princeton University Press, 2022).

<sup>13</sup> See, for instance, Mikael Hård and Thomas Misa eds., *Urban Machinery: Inside Modern European Cities* (Cambridge and London: The MIT Press, 2008); Carroll Pursell ed., *A Companion to American Technology* (Oxford and Malden: Blackwell Publishing, 2008).

<sup>14</sup> Olivier Coutard, Richard E. Hanley and Rae Zimmerman eds., *Sustaining Urban Networks: The Social Diffusion of Large Technical Systems* (London: Routledge, 2005).

exception in the above trend is a treatise on water infrastructure that takes a global and interdisciplinary perspective. This is the work edited by José Esteban Castro and Léo Heller under the title *Water and Sanitation Services*.<sup>15</sup> With 21 chapters, it covers American, European, Asian, African and Latin American experiences, policy interventions and developments in water infrastructure and associated technologies. This implies that there is virtually no other infrastructure that has reduced the ‘Eurocentric’ focus in terms of theme and theory. Additionally, there is no historical work that takes a global approach to the analysis of infrastructure.

Additionally, most modern technologies were developed or invented and innovated in the Global North before they circulated to other parts of the world. As part of the expanding hegemonic capitalism, the large technical systems were spread to the Global South by colonial missionaries, merchants, planters and administrators. Trade, religion and colonialism were important agencies in the circulation of large technological systems to the Global South. Had foreign religions and colonialism not penetrated Africa, perhaps the Japanese model of technological modernisation would have been used in some parts of, or across, the continent. Japan modernised her socio-technical systems by borrowing from the West. Or the continent would have developed its own large technological systems like those which existed in ancient Egypt.<sup>16</sup> Arguments of this nature, as Richard Evans puts it, are counterfactuals. Counterfactuals help test past realities and truths by offering alternative explanations of what could have happened under certain hypothetical conditions.<sup>17</sup> The borrowing of technology took place in the post-colonial era when many African states sought to develop and mechanise their agricultural and industrial production systems. In Africa, most of this borrowing failed greatly in the early decades of independence.<sup>18</sup> With technology almost exclusively moving from the Global North to the Global South, especially in the post-colonial era, the conventional accounts of technology have been preoccupied with what David Edgerton calls “the standard ‘western’ account of technology.”<sup>19</sup> In the last decade, this preoccupation has been challenged owing to its theoretical emphasis on the ‘diffusion’ narrative of technology. The diffusion narrative has been critiqued for its delineation of certain societies as lacking agency in shaping technological trends. Since the 19<sup>th</sup> century, Global

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<sup>15</sup> José Esteban Castro and Léo Heller eds., *Water and Sanitation Services* (London: Earthscan, 2009).

<sup>16</sup> See technological borrowing in Walter Rodney, *How Europe Underdeveloped Africa* (London: Bogle-L’Ouverture, 1972); cf. Olufemi Taiwo, *Africa Must Be Modern: A Manifesto* (Ibadan: Bookcraft Books, 2012).

<sup>17</sup> Richard J. Evans, *Altered Pasts: Counterfactuals in History* (London: Abacus, 2016).

<sup>18</sup> A.A. Mazrui, “Toward the Year 2000” in *General History of Africa: Africa since 1935*. Vol. VIII edited by A.A. Mazrui (California: Heinemann, 1993).

<sup>19</sup> David Edgerton, “Creole Technologies and Global Histories”, *HoST* 1 (2007), 92.

South societies have been prone to this narrative as they are considered passive technological actors.<sup>20</sup>

Current works are exploring how the Global South also influenced the technological development in the Global North as well as South-South influences using the less negative conceptual lenses of circulation and appropriation.<sup>21</sup> Jethron Akala asks the large technical system studies in the Global South to consider them as sites of theorisation, instead of treating the Global South as a source of research data.<sup>22</sup> Being cognisant of this lacuna, this study uses the case of drainage and traffic infrastructure in Dar es Salaam to show how we can theorise the history of technology from the Global South. This study supports all the efforts to develop and employ concepts that capture well realities in the Global South.

Still one cannot ignore the power of path dependence, especially in ‘Eurocentric’ analysis of African history, an analysis that has been deepened by colonisation and neo-colonisation of the continent since the late 19<sup>th</sup> century. A small body of literature exists on the large technical systems in Africa. The literature tends to follow either colonial or Africanist lines. The former line embraces the ‘diffusionist’ perspective hinted at above; under this perspective all African indigenous socio-economic and technological developments are rendered ‘primitive’, ‘outmoded’ and ‘uncivilized’.<sup>23</sup> This is the denial of African history which for a long time was erroneously justified because of the alleged “lack of sources.” In the colonial accounts, it was concluded that all histories about the continent were histories of white men’s activities in Africa.<sup>24</sup> On the other hand, African nationalist historical writing has countered vehemently the argument that follow colonial lines. The nationalist front has not been monolithic, so argues the historian Isaria Kimambo. In the 1960s, it was associated with a total denial of ‘diffusionist’ premises. In the 1970s and 1980s, the nationalist historical writing was heavily influenced by the Marxian perspective. The Marxian perspective made African history and social theory to change its focus from emphasising a stable political history prior to colonisation of the continent into looking at the origins of underdevelopment and suggesting potential solutions. Many scholars emphasised the centre-periphery relations within the international capitalist system and class relations within African societies as the main reasons for

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<sup>20</sup> Cf. J.M. Blaut, “Diffusionism: A Uniformitarian Critique,” *Annals of the Association of American Geographers* 77, no. 1 (1987), 30-47.

<sup>21</sup> *Ibid.*; see also in David Arnold, “Europe, Technology, and Colonialism in the 20<sup>th</sup> Century”, *History and Technology* 21, no. 1 (2005), 85-106.

<sup>22</sup> Jethron Ayumba Akala, “In the Technological Footprint of Urbanity: A Socio-political History of Water and Sanitation in Nairobi, 1899-2015” (PhD diss., Technische Universität Darmstadt, 2019).

<sup>23</sup> See Jean-François Bayart, “Africa in the World: A History of Extraversion”, *African Affairs* 99 (2000), 217-267.

<sup>24</sup> For an anecdotal exposition of this historiography see E.S. Atieno-Odhiambo, “From African Historiographies to an African Philosophy of History” in *Africanizing Knowledge* edited by Toyin Falola and Christian Jennings (New Brunswick and London: Transaction Publishers, 2002), 13-64, here at 16.



African countries failure to address their development challenges,<sup>25</sup> including the challenges associated with large technical systems.

### *1.3.2 Urban Infrastructure and Spatial Planning in African and Tanzanian Histories*

Daniel R Headrick wrote in 1981 that “the real triumph of European” imperialism on Africa and Asia in the 19<sup>th</sup> century “has been a triumph of technology, not ideology.” He added that “the connection between technology and imperialism must be approached from both sides: from the history of technology as well as from that of imperialism.”<sup>26</sup> These were critical statements that elaborated his famous ‘tools of the empire’ thesis. It is a thesis that is partly used to disentangle the 19<sup>th</sup> and 20<sup>th</sup> century European imperialism from the previous forms of imperialism because of its sheer reliance on technology. Technology was decisive during the conquest as well as the maintenance of the colonial grip over the Global South. Had it been not technology like guns, rails, ships, vaccines and electricity, the success of imperialism would have been minimal. Under this thesis, the infrastructure that circulated with imperial extensions from the Global North was not for modernising the continent but for sustaining imperial control on the Global South – the instrumental function of technology.

Headrick has ever since attracted a huge followership on his ‘tools of the empire’ thesis because of its obvious, simple and powerful truth.<sup>27</sup> The historian Doug Feremenga subscribed to the ‘tools of the empire’ thesis when he opined that there is a consensus among African historians that in urban areas “infrastructure was barely available and where it existed, it aimed at exploiting and controlling natural and human resources for the benefit of the imperial masters, rather than developing the colony.”<sup>28</sup> This work demonstrates the validity of this thesis in relation to colonial Dar es Salaam by showing how infrastructure was introduced and used to achieve different colonial objectives. The roads, railways and ports were built to transport resources from upcountry to the coast for shipping abroad. The roads within the city served to provide mobility and control through space. Through roads, too, other technologies of power, water and drainage attained a space for extensions to different households – streets became technological junctions. On the one hand, they finally became the technologies of modernising African landscapes, and tools of technological

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<sup>25</sup> Isaria N. Kimambo, *Three Decades of Production of Historical Knowledge at Dar es Salaam* (Dar es Salaam: DUP, 1993); see also Abbott, *Green Infrastructures*, 1-5.

<sup>26</sup> Daniel R. Headrick, *The Tools of Empire: Technology and European Imperialism in the Nineteenth Century* (New York and Oxford: Oxford University Press, 1981), 4.

<sup>27</sup> See, for instance, Massimo Moraglio, “Peripheral Mobilities: Looking at Dormant, Delegitimized and Forgotten Transport Regimes”, *Tempo Social* 30, no. 2 (2018), 73-85, here at 73-4.

<sup>28</sup> Doug Feremenga, “Urban Development and Planning in Zimbabwe: A Historical Perspective,” in Salm and Falola eds., *African Urban Spaces*, 341.

representation in order to enable European administrators to live a life comparable to what they had left at home in Europe on the other. Still, a development researcher, John Abbott, argues that the “imposed” infrastructures “were inferior to the services provided in their own countries,” a plot which was “morally indefensible.”<sup>29</sup> Because of the circulation of infrastructure in the context of imperialism, Africa was dispossessed of its internal force to provide viable infrastructural services that matched her local environment. But there was more to that.

The new infrastructure was not the best quality and did not adequately meet all the needs of the people in Africa. This had far-reaching consequences. This thesis identifies lack of maintenance and repair as one of the vivid and quintessential features of the circulated technologies. Socio-politically, Abbott says that it represented Africans as “second-class global citizens and in doing so create a developmental framework that induces a fundamentally unstable political condition across all urban areas – a recipe for ongoing strife.”<sup>30</sup> This work, while not denying Abbott’s assertion, does not intend to discuss the relationship between political instability and the provision of infrastructure in Dar es Salaam. Rather, it demonstrates how the provision of infrastructure appropriated alienation tendencies through class, medical and racial factors. This shows why it is important to put Abbott’s argument into perspective using Stephen Graham and Simon Marvin’s ‘splintering urbanism’ thesis.<sup>31</sup> To be precise, Abbott did not find space for citing Graham and Marvin. One can associate such omission with the fact that the splintering thesis was originally developed for the contemporary rather than historical conditions, and for the Global North rather than Abbott’s African context.

The architects of splintering urbanism, which is considered by scholars of urban technologies as a typical modernist theory, contend that the modern ideal of networked infrastructure is falling apart as cities and their dwellers are divided in the way utilities and services are offered.<sup>32</sup> This theory was conceived to provide an explanation about the crisis in the universal provision and access to infrastructural services, citing examples from the unequal access to information through ICT infrastructure. It also sought to explain how issues of class have been instrumental in breaking up the utility services ideal of universality and ubiquity – an ideal which, according to Theodor Adorno and Max Horkheimer, has been a rule of thumb in modern cities in the world since the enlightenment era.<sup>33</sup> This is not different from stating that splintering urbanism

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<sup>29</sup> John Abbott, *Green Infrastructure*, 61-2.

<sup>30</sup> *Ibid.*, 62.

<sup>31</sup> Stephen Graham and Simon Marvin, *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition* (London: Routledge, 2001).

<sup>32</sup> Olivier Coutard et al. eds., *Sustaining Urban Networks: The Social Diffusion of Large Technical Systems* (London: Routledge, 2005), 2-4.

<sup>33</sup> Max Horkheimer and Theodor Adorno, *Dialectics of Enlightenment: Philosophical Fragments* translated by Edmund Jephcott (Stanford: Stanford University Press, 2002).

addresses ethical issues by inserting questions of normative values into the analysis and discussion of urban infrastructure. Developed by urban geographers, the theory has been criticised by its overemphasis on unbundling infrastructural services and access. However, one cannot deny that splintering urbanism is powerful, despite its background and focus. It can be used to illustrate truths beyond its borders, as we do in this thesis in relation to Dar es Salaam as well as in Jakarta City, as done by Michelle Kooy and Karen Bakker in 2008. Thus, we seek to emphasise that studies on infrastructure in history and the social sciences have much in common and cannot be understood if they are taken out of their urban contexts.

The historical research on urban infrastructure in Africa was for a long time examined as part of the general regional histories that discussed conventional subject matters such as pre-colonial, colonial and post-colonial political, economic and social development.<sup>34</sup> The emphasis was on demonstrating the ‘tools of the empire’ thesis. As such, some basic details of purely technological aspects were missed in the process. For instance, in urban South Africa one could learn about urban infrastructure when reading the history of mining and subsequent racial segregation. The study of infrastructure as a historical phenomenon in its own right began in the 1980s. The few studies done examined infrastructure as part of national or regional economic integration and development. In the process, urban infrastructure was invisible or understudied. This was not accidental. The context of the first four decades of African independence was influenced by the policy of backtracking colonial underdevelopment by linking different parts of the nations. There was more to that: most African development policies favoured rural development at the expense of urban development because more than two thirds of their populations were agrarian and rural.<sup>35</sup> In Tanzania, one could study urban infrastructure as part of the national agenda, and not as a local agenda. Frank M Chiteji, for instance, wrote a history of the transport infrastructure of Tanzania in 1980 which barely assessed the urban traffic infrastructure.<sup>36</sup> Barbara Ntombi Ngwenya employed the same territorial approach as Chiteji in 1984 when she examined the development of transport infrastructure in modern-day Botswana.<sup>37</sup> A decade ago, Jamie Monson studied the role of the TAZARA railway in linking Zambia to the Indian Ocean port in Tanzania for the import and export of goods and services.<sup>38</sup> And Julia Tischler examined,

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<sup>34</sup> Akin L. Mabogunje, “Urbanization in Nigeria: A Constraint on Economic Development”, *Economic Development and Cultural Change* 13, no. 4 (1965), 413-438.

<sup>35</sup> David J. Parkin, “Along the Line of Road: Expanding Rural Centres in Kenya’s Coast Province”, *Africa* 49, no. 3 (1979).

<sup>36</sup> Frank M. Chiteji, *The Development and Socio-Economic Impact of Transportation in Tanzania, 1884 – Present* (Washington, D.C.: University of America Press, 1980).

<sup>37</sup> Barbara Ntombi Ngwenya, “The Development of Transport Infrastructure in the Bechuanaland Protectorate 1885-1966” in *Botswana Notes and Records* 16 (1984), 73-84.

<sup>38</sup> Jamie Monson, *Africa’s Freedom Railway* (Indianapolis: Indiana University Press, 2009).

among other things, the place of the Kariba dam power project in the development narratives of modern-day Zambia.<sup>39</sup> All these works employed a functionalist approach, which is analytically insufficient as it hinders us from gaining a nuanced understanding of African history of technology. Specifically, the works emphasise grand narratives at the expense of local narratives from towns and cities.

The emphasis on rural development and national histories also contributed to holding back the development of urban studies. This shows why most urban studies emerged in the last three decades (1990-2020). This is revealed in historical works on urban Africa such as Bill Freund's *The African City*,<sup>40</sup> Francesca Locatelli and Paul Nugent's *African Cities*<sup>41</sup> or Steven J Salm and Toyin Falola's *African Urban Spaces in Historical Perspectives*.<sup>42</sup> Despite late development in urban studies in both social and historical sciences, the impression that one gets from the works is that urban infrastructure do not matter much or they are not an important subject-matter. This impression was dominant up to 2010. However, since the onset of the 21<sup>st</sup> century, there have been some significant repairs to the old adage. The works in this direction include John Abbott's *Green Infrastructures for Sustainable Urban Development in Africa*,<sup>43</sup> Ahmad Sikainga's *The City of Steel and Fire*<sup>44</sup> and Tom McCaskie's "Water Wars' in Kumasi Ghana."<sup>45</sup> These scanty studies on technology are important in that they give us some inspirations, conceptual frameworks and time-perspective approaches to understanding technical systems in African contexts. However novel their approaches are, much is yet to be appreciated in understanding the historical relationship between urbanisation and technology. A lot of invaluable knowledge such as the circulation, appropriation and vulnerability of urban infrastructure remain unappreciated.

The general context of urban infrastructure studies in Africa bears many similarities to the project area of this research. Examining Dar es Salaam, one notices that the city has a rich literature on urbanisation. Unfortunately, the literature is an outcome of recent research and is lacking rich discussion on large technical systems. There has been a significant omission and under-conceptualisation of urban technical systems. This is not uncommon in other African cities. Urban studies on Dar es Salaam only mentioned infrastructure and technology in passing. To the few

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<sup>39</sup> Julia Tischler, *Light and Power for a Multiracial Nation: The Kariba Dam Scheme in the Central African Federation* (Basingstoke and New York: Palgrave Macmillan, 2013).

<sup>40</sup> Freund, *African City*.

<sup>41</sup> Locatelli and Nugent, *African Cities*.

<sup>42</sup> S.J. Salm and Toyin Falola eds., *African Urban Spaces in Historical Perspectives* (New York: University of Rochester Press, 2005).

<sup>43</sup> Abbott, *Green Infrastructures*.

<sup>44</sup> Ahmad A. Sikainga, "City of Steel and Fire": *A Social History of Atbara, Sudan's Railway Town, 1906-1984* (Oxford: James Currey, 2002).

<sup>45</sup> Tom C. McCaskie, "Water Wars' in Kumasi Ghana", in Locatelli and Nugent, *African Cities*.

exceptions belong a discussion of the early colonial urban roads by the historian John Iliffe<sup>46</sup> and an investigation of the early German attempts to create a centralised water supply system (finally introduced in the 1950s) by the geographer Marianne Kjellén.<sup>47</sup> Between 2010 and 2021, there has been an increase in the number of works that explore infrastructure in Dar es Salaam. However, with the exception of the work by Frank Edward and Mikael Hård,<sup>48</sup> the other works have been undertaken by social scientists who emphasise the recent infrastructure development and ethnographic analysis. The works include Malve Jacobsen's *Assembling Bus Rapid Transit in the Global South* (2021), Sarah L. Smiley's "Heterogeneous Water Provision in Dar es Salaam: The Role of Networked Infrastructures and Alternative Systems in Informal Areas" (2020) and Jochen Monstadt and Sophie Schramm's "Toward the Networked City? Translating Technological Ideals and Planning Models in Water and Sanitation Systems in Dar es Salaam" (2017). Still, not all kinds of infrastructure have received attention. Most researchers prefer water and sanitation infrastructures to roads, power and drainage. This work attempts to plug this gap by, first, drawing inspiration from history, and secondly, paying attention to the understudied traffic and drainage infrastructure.

It is important to give credit to social science and historical studies which explore colonial and post-colonial spatial planning in urban Africa. The first reason is that they draw some inspiration from history in explaining infrastructural configurations. They account for what makes the distribution of infrastructure to assume certain shapes and ideals. They describe how infrastructure circulated and splintered in the past and why it continues to be splintered. In other words, urban planning studies have been critical avenues for studying urban infrastructure. Some of the works in this line include J M Lussuga Kironde's "The Evolution of the Land Structure of Dar es Salaam 1890-1990" (1995), Ambe J Njoh's *Planning Power: Town Planning and Social Control in Colonial Africa* (2007), William C Bissell's *Urban Design, Chaos, and Colonial Power in Zanzibar*, Robert Home's *Of Planting and Planning: The Making of British Colonial Cities* (1997) and Allen Armstrong's "Colonial and Neocolonial Urban Planning: Three Generations of Master Plans for Dar es Salaam, Tanzania" (1986). These studies present spatial plans as modernist tools which were used in controlling population interactions and as cultural symbols of power in African colonial. In principle, the utility of plans was tripartite: modernisation, demonstration of politico-cultural power and economical categorisation, especially through the adoption of zoning systems. The plans were used to translate the infrastructure in urban settings because they provided an infrastructure layout

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<sup>46</sup> Iliffe, *Modern History*.

<sup>47</sup> Marianne Kjellén, "Complimentary Water Systems in Dar es Salaam, Tanzania: The Case of Water Vending", *Water Resources Development* 16, no. 1 (2000): 143-154.

<sup>48</sup> Frank Edward and Mikael Hård, "Maintaining the Local Empire: The Public Works Department in Dar es Salaam, 1920-1960", *Transport History* 41, no. 1 (2020): 27-46.

and defined urban land use. As it turned out, the infrastructure was splintered as it was built along racial and class lines.

Instead of using the concept ‘splintering’, the previous studies invariably employed the concept of segregation to show how the provision of infrastructure was not inclusive. Since splintering is specifically used in infrastructure studies, this study drops or suggests reducing the use of the concept segregation because the latter concept is broad, cross-cutting and very general. To be precise, segregation covers social, political, economic and cultural matters in apartheid South Africa, ante-bellum South, colonial worlds and in places where marginalisation was rife in the past. This leaves out the post-colonial and post-antebellum unequal provision of infrastructure when colonialism and oppression are replaced by class, ethnic and economic forms of exclusion. Segregation is a concept that goes beyond the infrastructure research and this poses a danger of blurring analysis. Unlike the intentions of architects of the theory, this work extends splintering urbanism in the Global South by analysing the continuity of infrastructure exclusion at present. It veers from the political narrative that portrays segregation discontinuity through change in the governance and provision of infrastructure.

Spatial planning studies help us to understand the circulation and appropriation of urban technologies far better than conventional histories. But they also help us to discern the dynamics of appropriation. In this study, for instance, they are used to juxtapose the generalised concept of segregation with the provision of infrastructure in Dar es Salaam during the German and British colonial periods – periods which have erroneously been treated as having the same and unchanging splintered urban technologies. This juxtaposition is critically discussed in Chapter III of this thesis.

### *1.3.3 Urbanisation and Climate Change in Africa and Tanzania*

In 2009, Khady Diagne and Abdoulaye Ndiaye – a Senegalese geographer and a legal expert, respectively – conceded that Africa and its cities “are prone to many hazards. In addition, the consequences of global warming, climate change and a rise in sea level, combined with uncontrolled urbanization, are among the causes of increasingly frequent floods.”<sup>49</sup> The two scholars underscored the fact that floods have become frequent in the Senegalese city of St Louis because people have immigrated into previously uninhabited lowlands and banks of the Senegal River “thereby preventing proper gravity-based water runoff.” Population grew fast, thus creating a planning challenge to the city. However, not all of the population in St Louis has been prone to floods: it is only the population found in the hazardous areas that has been prone to floods. A

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<sup>49</sup> KhadyDiagne and Abdoulaye Ndiaye, “History, Governance and the Millennium Development Goals: Flood Risk Reduction in Saint-Louis, Senegal” in *Disaster Risk Reduction: Cases from Urban Africa* edited by Mark Pelling and Ben Wisner (London: Earthscan, 2009), 147.

similar population growth-related flooding has been noted in Dar es Salaam by Robert Kiunsi et al in the lowlands of Msasani Bonde la Mpunga and Vingunguti. Kiunsi et al note that population growth has increased the quantity of built structures in the formerly recognised hazardous areas, thus leading to the “blocking of river courses that drain storm water to the Indian Ocean.”<sup>50</sup> This implies that there is a consensus among African scholars that the recent past and present floods are not caused solely by climate change. Rather, they are caused by human activities – settlement and farming – in the obvious hazardous lands.

Examining critically the floods on African cities of St Louis, Dar es Salaam, Addis Ababa and Ouagadougou discussed in other studies on urbanisation and climate change,<sup>51</sup> one notes that they lack verifiable data and statistics on flood levels over long durations. Much of their findings present recent impressions. Accounts from other continents on urban flooding can clearly be distinguished between those associated with tropical cyclones, sea level rises and tsunamis, and those associated with climate change. It is not the case with Africa, save the areas found in Mozambique, Madagascar, Mauritius and Reunion. Recently, a historian of technology, Daniel R Headrick, published an article that highlights the past and contemporary debates on climate change across the world. It identifies a consumerism culture and developmentalism as two powerful forces that greatly obliterate the world’s futures by producing emissions that destroy the ozone layer and global climates. Headrick demonstrates how climate change and its impact are real by drawing on long-term rainfall and temperature figures. He looks at the impact of climate change that has faced the Global North and some Asian countries, but not Africa.<sup>52</sup> The studies on urban vulnerabilities caused by climate change in Africa as in those cited above include neither statistics for rainfall nor temperature figures to prove their arguments. This study builds on inspirations from Headrick’s historical evidence use to address association of flooding solely with climate change in Dar es Salaam. It seeks to broaden our understanding of floods by avoiding blaming climate change alone. However, this should not be interpreted as denying any possible influence of climate change on the present and future flooding events. Instead, social scientists and environmental scholars are advised to collaborate with historians in investigating the nexus between flooding and climate change in order to develop a more truthful relationships, rather than making statements that are not supported with data.

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<sup>50</sup> Robert Kiunsi et al., “Building Disaster-Resilient Communities: Dar es Salaam, Tanzania” in *Disaster Risk Reduction: Cases from Urban Africa* edited by Mark Pelling and Ben Wisner (London: Earthscan, 2009), 138.

<sup>51</sup> See Stephan Pauleit et al. eds., *Urban Vulnerability and Climate Change in Africa: A Multidisciplinary Approach* (Heidelberg: Springer, 2015). This volume is produced by scholars from the both Global North and South countries. However, it seems the agenda came from the Global North scholars because they were the ones interested in building a network of scholars working on climate change impacts in urban Africa with funding from the European Union.

<sup>52</sup> Daniel R. Headrick, “Climate Change: Debate and Reality,” *International Review of Environmental History* 5, no. 1 (2019).

### 1.3.4 Urban Storm-Water Drainage and the Traffic Infrastructure in Africa and Tanzania

Unlike in the Global North, the existing urbanisation literature on the Global South set little space for discussing the interdependent relationship between traffic and drainage as urban technologies. Additionally, the literature does not discuss the engineering side of public works. With much of them written historians with no orientation to historical studies of technology and society, they present to us little knowledge about the circulation, adaptation, criticality and vulnerability of urban technologies. However, there are works that examine drainage and traffic infrastructure separately. In the social sciences, most urban studies that pay some attention to the problem of flooding contend that urban areas lack or have inadequate storm-water drainage. This means that they provide accounts that consolidate the deficiency narrative, a narrative that is very popular in most African urban research.<sup>53</sup> There are also a few works from the environmental and civil engineering fields that have paid attention to the problems relating to urban drainage in Africa. In particular, they focus on design issues and what makes drainage not to work. They go beyond subscribing to the deficiency narrative by describing some basic technical issues of drainage. For instance, they show that open surface drains exist in most African cities lacking maintenance, and are thus blocked by sand, silt and waste. One good example is Brian Reeds' "Storm-water Management in Low-income Countries," a work which makes a survey of urban drainage studies on Kampala, Lagos and Abuja.<sup>54</sup>

Unlike drainage, the traffic infrastructure has attracted a significant attention of social scientists, especially from cultural anthropologists. This came after a long time of taking for granted the materiality of such infrastructure owing to its daily use. The cultural anthropologists Kurt Beck, Gabriel Klaeger and Michael Stasik contend that the traffic infrastructure has a "solid ontological background status," which makes it invisible to users until it is either obstructed or under construction. The realisation of an obstruction or a construction project is thus 'an epistemic moment', an avenue for understanding African road user experiences, experiences which their edited volume on African roads sought to tap into and explain. Unfortunately, there is no essay in the volume devoted to urban roads. The volume "addresses the motor road in Africa, in particular the long-distance road."<sup>55</sup> Previously, Libbie Freed had written about roads in French Central Africa. While he used the historical perspective, Freed was also not interested in urban roads nor

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<sup>53</sup> See, for instance, Tumpale Sakijege et al., "Government and Community Involvement in Environmental Protection and Flood Risk Management: Lessons from Keko Machungwa, Dar es Salaam, Tanzania," *Journal of Environmental Protection* 5 (2014), 760-771.

<sup>54</sup> Brian Reed, "Storm-water Management in Low-income Countries," *Municipal Engineer* 166, no. ME2 (2012), 111-120. In Reed's work a number of researches from African cities are cited.

<sup>55</sup> Kurt Beck, Gabriel Klaeger and Michael Stasik, "An Introduction to the African Road" in *The Making of the African Road* edited by Kurt Beck, Gabriel Klaeger and Michael Stasik (Leiden and Boston: Brill, 2017), 1.



in their association with urban drainage. His interest was in how roads became the contested terrain between the locals and colonisers.<sup>56</sup> In other three ethnographic publications, urban roads are given significant attention. The publications are Timo Basteck's et al's *Trunk Infrastructure and Urban Growth: Managing Rapid Urbanisation in Poverty Dar es Salaam* (2008), Caroline Melly's *Bottleneck: Moving, Building, and Belonging in an African City* (2017) and Daniel Mains' *Under Construction: Technologies of Development in Urban Ethiopia* (2019). The three volumes examine the building of traffic infrastructure as part of the contemporary urban modernisation and state developmentalism, and as an avenue for creating new forms of alienation and inequality.

Like the other works on roads, these three works also evade the question of urban drainage and focus, instead, on contemporary development as a result of using an ethnographic methodology. Even when the obstruction of traffic is mentioned, the storm-water factor is not included in it. Therefore, this study attempts to plug these gaps in order to enrich our understanding of Dar es Salaam infrastructure and its interconnectedness. Inspired by the works on roads, this thesis extends the discussion of traffic infrastructure in relation to drainage over longer duration. Using a historical perspective, the thesis also goes beyond the traffic obstructions caused by building or repair to those caused by storm water, which implies the presence of poor, or lack of, drainage infrastructure.

#### **1.4 Sources and the Approach**

This study analysed written and visual sources to reconstruct the dynamics in the interdependence between the traffic and drainage infrastructure in Dar es Salaam City, Tanzania. The objective was to demonstrate how flooding was a by-product of spatial planning, engineering cultures and infrastructural policies for almost a century. The sources were drawn from the archives of three countries: Tanzania, the United Kingdom and Germany. The materials from the three countries have provided information that incrementally facilitated the making of a coherent account and argument. Like many other works on African history, this study demonstrates the 'hodgepodge' nature of the sources and the way they are scattered.<sup>57</sup> In Tanzania, much of the information on the colonial period was drawn from the Headquarters of the National Archives of Tanzania (TNA) in Dar es Salaam. With respect to the post-colonial period, the archival materials were collected from the Central Zone National Archives (CZNA) in Dodoma. The materials found at CZNA had come from the Prime Minister's Office and mainly covered the post-colonial era. Such materials

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<sup>56</sup> Libbie Freed, "Networks of (colonial) power: roads in French Central Africa after World War I", *History and Technology* 26, no. 3 (2010), 203-223.

<sup>57</sup> Luise White, "Hodgepodge Historiography: Documents, Itineraries, and the Absence of Archives," *History in Africa* 42 (2015), 309-318.

were not available the TNA headquarters in Dar es Salaam. The materials indicated that, for a long time during the post-colonial era, urban and local governance issues in Tanzania were dealt with by the Prime Minister's Office. In this work, the materials from TNA have been used in writing of Chapters II, III and IV, whereas those from CZNA have been used in writing of Chapters II, V and VI.

Other important primary and secondary sources of data in Tanzania were the National Library of Tanzania in Dar es Salaam, the library of the University of Dar es Salaam, the library of the Ministry of Lands, Human Settlement and Development and the Information and Press Department of the Ministry of Information, Culture and Sports. Most of the visits to the archives were made in the period between 2015 and 2017 when the political climate was not friendly to the freedom of academia and associated research. In particular, this research had to rely mainly on written sources to avoid putting political pressure on the potential respondents since matters of drainage and traffic were likely to attract questions over the construction projects associated with the then president, John Pombe Magufuli. Unfortunately, the critical Ministry for Works in Tanzania had not arranged for its materials to be accessed by historians, nor did it have its own library at the time of this research. Meeting the bureaucrats of the ministry was also difficult. The researcher met the record-keeping staff, most of whom could not identify the files needed or were unwilling to open dusty record boxes. Thus, the researcher turned to ministerial speeches retrieved from the Hansard of the Parliament of Tanzania. He also consulted old newspaper accounts, which were retrieved from other libraries. In the end, the researcher learnt that the Ministry of Works did not have any influence on local urban infrastructure. Its focus was on national infrastructure and construction issues. Urban infrastructure was, thus, left to the Ministry of Lands and the Prime Minister's Office. This explains why most accounts of traffic and drainage issues relating to Dar es Salaam came from the two ministries. At the Ministry of Lands, the experience was impressive. The researcher was given audience to the Survey Department Director, Dr Lyamuya who gave him, among other things, gave access to the library of the Ministry, introduced him to the Deputy Director for Regional Planning, Mr Mahenge, advised him to visit the Photographic Unit, where he met Mr Kinawiro and retrieved aerial photographs of certain parts of Dar es Salaam City taken the 1970s and 1980s. These photographs are important in showing the spatial dynamics of the city. At the Ministry of Lands library, he got some ministerial speeches and the 1979 master plan, which was missing from the library of the University of Dar es Salaam.

In the United Kingdom, the archival and documentary sources at the National Archives (BNA), the British Library (BL), the Weston Bodleian Library at Oxford University, the library of the Institution of Civil Engineers (ICE) and the library of the School of Oriental and African

Studies (SOAS) were consulted. The visits to British archives and libraries took place in a period from February to April in 2016, and, again, in June 2018. The documents retrieved were colonial reports from the public works, medical and sanitary services departments of Tanganyika; colonial correspondences between colonial officials in Tanganyika and those in Foreign Affairs and Colonial offices; memoirs of former technocrats who had worked in Tanganyika; and general colonial records and reports pertaining to civil engineering and infrastructure. The records retrieved from these locations were largely not available in Tanzania. They were very good primary materials, especially with respect to the colonial period. They varied from colonial reports to London, proceedings of ICE meetings over colonial engineering projects to correspondences with officials and personal perspectives over colonial peoples, infrastructure and development as well as rare maps of Dar es Salaam in the German and early British colonial period. From Weston Bodleian Library, formerly known as the Rhodes House, the researcher retrieved maps of the German colonial period and the microfilms of the Dar es Salaam annual district reports, which are not available in Tanzania. These materials that have been used in the historical reconstructions and analyses done in Chapters II, III, IV and VI.

The newspapers provided the researcher with different truth dimensions, depending on the nature of a given excerpt. From the letter-to-the-editor sections, with the researcher obtain a public perspective on the state of infrastructure and what the public wanted to done. The headlines provided him with either a paper's or the state's position state of infrastructure. The pictures and cartoons mainly projected the position of a paper to the public so that the state could intervene on the bad conditions of infrastructure. The pictures and cartoons are used in this thesis for illustration purposes and for the purpose of maintaining the photographers' and cartoonists' messages. Apparently, most government officials, as some of the correspondences indicate, showed displeasure to the images and accounts because they portrayed the perspectives of either the paper or public on the incumbent administrations. Therefore, it is correct to argue that some of the solutions to drainage problems were not proactive, but rather reactionary to the media and public outcry.

### **1.5 Organisation of the Thesis**

This study is about Dar es Salaam drainage and traffic infrastructure. The thesis is organised into seven chapters. Each chapter focuses on one major theme. Chapter I provides introductory remarks about the whole thesis. Chapter II presents the socio-economic and political dynamics and a description of the study area so that the changing traffic and drainage issues can be understood. Chapters III, IV and V are largely about Dar es Salaam and the technical infrastructure found there

in the colonial and post-colonial periods. Chapter VI examines the development of technical education in Tanzania. Chapter VI shares with the other chapters the uniqueness of doing a historical analysis of drainage and traffic infrastructure. It is more unique in that it is the first historical account that provides an analysis of the nature and development of technical education, urban planning and the engineering profession in Tanzania. The evolution of technical education is discussed in tandem with the colonial-post-colonial continuity of flooding on the street roads in Dar es Salaam. Chapter VII provides a conclusion based mainly on the theoretical issues that were key to the analysis done in the preceding chapters. Finally, there is a postscript which presents the continuity of the flood problem in Dar es Salaam in the 21<sup>st</sup> century. The Postscript shows how a new environmental understanding has led recent urban studies to associate flooding with climate change and land submergence at the expense of historical facts. It also discusses the recent anti-flood measures which have been taken by local and international agencies and which have made the city more resilient to flooding.

## CHAPTER II

### A SURVEY OF THE SOCIAL AND POLITICAL HISTORY OF DAR ES SALAAM

Over the last two centuries, the history of Dar es Salaam has been a story of the city's transformation from a predominantly wild, trifling and less colonised rural area into an exuberantly vibrant, highly politicised, densely inhabited and economically significant city. As the most dynamic and transient urban space, Dar es Salaam has become a representation of Tanzania's urban mutations and history. Politically, the city has been the centre of modern nation-state formation and politics. German East Africa, British Tanganyika and independent Tanzania all used Dar es Salaam as their state capital. All government departments and agencies had their headquarters in the city. Demographically, Dar es Salaam did not have a large population during the 19<sup>th</sup> century. Its population started rising fast in the post-World War II era because of immigration and improvement in social welfare. The majority of natives have been pushed on to the margins of the city and neighbouring spatial locations by the incoming upcountry and international communities, thereby making the city the most cosmopolitan place in Tanzania. Currently, Dar es Salaam is the second most populated city in Eastern and Central Africa after Kinshasa, the capital of the Democratic Republic of the Congo. It has about 5.8 million people despite its small land size.<sup>1</sup> The city commands the vibrant commercial and trading activities. It has the biggest port and airport in Tanzania, the biggest consumer market as well as the biggest financial institutions. The political, commercial and population factors have had a significant influence on infrastructural development. While offering a succinct survey of the city's history, this chapter argues that understanding urban and infrastructural transitions, particularly drainage and traffic infrastructure would also require discerning other forces at work that impact on urban technologies and associated policies. Such forces include geography, politics, trade and commerce, and demography.

#### 2.1 The Geography of Dar es Salaam

Dar es Salaam is located on the coast of the Indian Ocean in central-east Tanzania. With a landmass of about 1,121.3 square kilometres, the city is specifically located between latitudes 6.4° and 6.9° south of the Equator, and between longitudes 39.0° and 39.5° east of Greenwich. As a coastal area in the tropics, Dar es Salaam receives an annual temperature average of 26° Celsius.

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<sup>1</sup> Retrieved from <http://www.nbs.go.tz> on 12.12.2017.

The hottest months are January, February and March when the average temperatures can be as high as 33° Celsius, whereas the coolest months are June, July and August with the temperature averages falling to about 23° Celsius. There is virtually no month in which rain does not fall in the city. The hottest months are usually wetter due to heavy rainfall. The average rainfall in the wet months can be between 150mm and 240mm from February to May. In the cooler months, the rainfall averages can be as low as 20mm in September and as high as 40mm in June. But during the rainy months, rainfall levels of single days were frequently higher than average. In the 1930s report produced by R Mackay, the Malarial Research Officer for Dar es Salaam, the township recorded the amount of about 503mm in one day in 1920. In 1936, it recorded about 1348mm for one day.<sup>2</sup> As such, Dar es Salaam has the highest rainfall levels, which is one of the factors for frequent flooding.<sup>3</sup> Given the city's relative wetness and dryness, the weather seasons are put into two categories: the wet and dry season. The period from December to May is wet, and the period from June to November is dry.<sup>4</sup> This seasonal categorisation of weather is also true for many other parts of Tanzania.

Topographically, Dar es Salaam rises gently from 0 to 100 metres above sea level. There are hills, creeks, coastal plains, swamps and coastal plateaus in the city. Graham Sumner, in his intensive and wonderful study on rainfall storms in Dar es Salaam in 1979, indicated how prone the site of city is to flooding because of its low relief. The area where the Germans planned to build the first city, the proto-city, is relief-wise lower than its surrounding areas with less than 10 metres above sea level.<sup>5</sup> The proto-city was founded in a coastal plain between the Msimbazi and Gerezani creeks. If storm water does not flow to the two creeks, then it flows to the proto-city, an area which hosts the critical government offices and institutions such as the state house and ministries as well as five-star hotels, embassies of various countries and headquarters of international agencies such as UNESCO. Apart from the relief cross-section, sand can also be associated with the poor natural drainage. The urban geographer Adolfo Mascarenhas contended in the mid-1960s that most of the city soils are sandy and therefore “advantageous in the former African residential areas, where there was a poor storm drainage,”<sup>6</sup> contrary to what archival materials portray. Additionally, the geomorphologist Paul Temple found out in 1970 that most of the soils are generally sandy with huge variations between sandy clays, clay-bound sands and sandy clay-loams. The coastal plains are

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<sup>2</sup> Tanganyika Territory, *Second (Final) Report of the Malaria Unit, Dar es Salaam, for the period November 1934 to December 1936* (Dar es Salaam: The Government Printer, 1938), 24.

<sup>3</sup> Graham Neil Sumner, “Storm Occurrence over Dar es Salaam, Tanzania” (King’s College London, PhD Thes., 1979).

<sup>4</sup> Adolfo C. Mascarenhas, “Urban Development in Dar es Salaam” (University of California, M.A. Thes., 1966), 31; D.J. Bargman, “The Climate of Dar es Salaam”, *Tanzania Notes and Records* 71 (1970), 55-68.

<sup>5</sup> Sumner, “Storm Occurrence over Dar es Salaam”.

<sup>6</sup> Mascarenhas, “Urban Development”, 30.

more sandy clay-loams, whereas the hills and coastal plateaus have clay-bound sands with a few plateaus having deep and red rendzinas.<sup>7</sup> As early as 1920, the British concluded that Dar es Salaam's "upper soil is extremely porous but it rests on a bed of clay."<sup>8</sup> Consequently, even what Mascarenhas presumed as drainage-friendly soils had more clay material that retained water for a long time. The presence of many shallow wells and boreholes as the source of fresh water, especially in colonial Dar es Salaam, vindicates the truthfulness of such geographical properties.

These geographical properties are important in understanding why the Zaramo people used to grow coconut and the short-season crops like rice, cassava and sorghum. These crops naturally adapted to the predominantly sandy soils. The soils also show why the pre-colonial, colonial and early post-colonial African residents in Dar es Salaam built their houses using wattle poles and mud for the walls and coconut leaves for the roofs.<sup>9</sup> Soils have to contain a significant proportion of clay elements in order for it to be used to construct buildings that would withstand heavy tropical rains and winds. Dar es Salaam soils were, to a large extent, sandy clays, especially in the areas where native settlements were established. This explains how traditional building technologies were adapted to the immediate geography. In the pre-colonial era, the Africans built small round huts as residential houses. But because of German colonisation and circulated urbanisation processes, the round huts were limited to the outskirts of the city. In the city proper, the rectangular designs were enforced to every resident, including Africans. They appropriated building designs but not the building materials. Africans continued using wattle poles, mud and coconut leaves or special grass for roofing. The newly introduced materials like coral blocks and corrugated iron sheets became exclusive building materials for the commercial, European and government zones.<sup>10</sup> Another apposite trait to note here is that, during the pre-colonial era, Africans built their houses in areas that were gently elevated, thus avoiding the storm-water drainage locations. This explains why no historical record has offered any details of the occurrence of flooding in human settlements. Floods became an annual phenomenon from the German colonial period onwards. As will be elaborated in Chapter III, the flooding caused by storm-water drainage problems in colonial and post-colonial Dar es Salaam was a function of natural and anthropocentric factors and processes. In this section, we have identified the natural properties such as heavy rain and soils as key in explaining the antecedents of flooding in the colonial period.

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<sup>7</sup> Paul H. Temple, "Aspects of the Morphology of the Dar es Salaam Area", *Tanzania Notes and Records* 71 (1970), 21-53.

<sup>8</sup> Tanganyika Territory, *Annual Reports of the Principal Medical Officer and the Senior Sanitary Officer, 1918-1920* in BNA CO 736/13: Tanganyika: Executive Council Minutes.

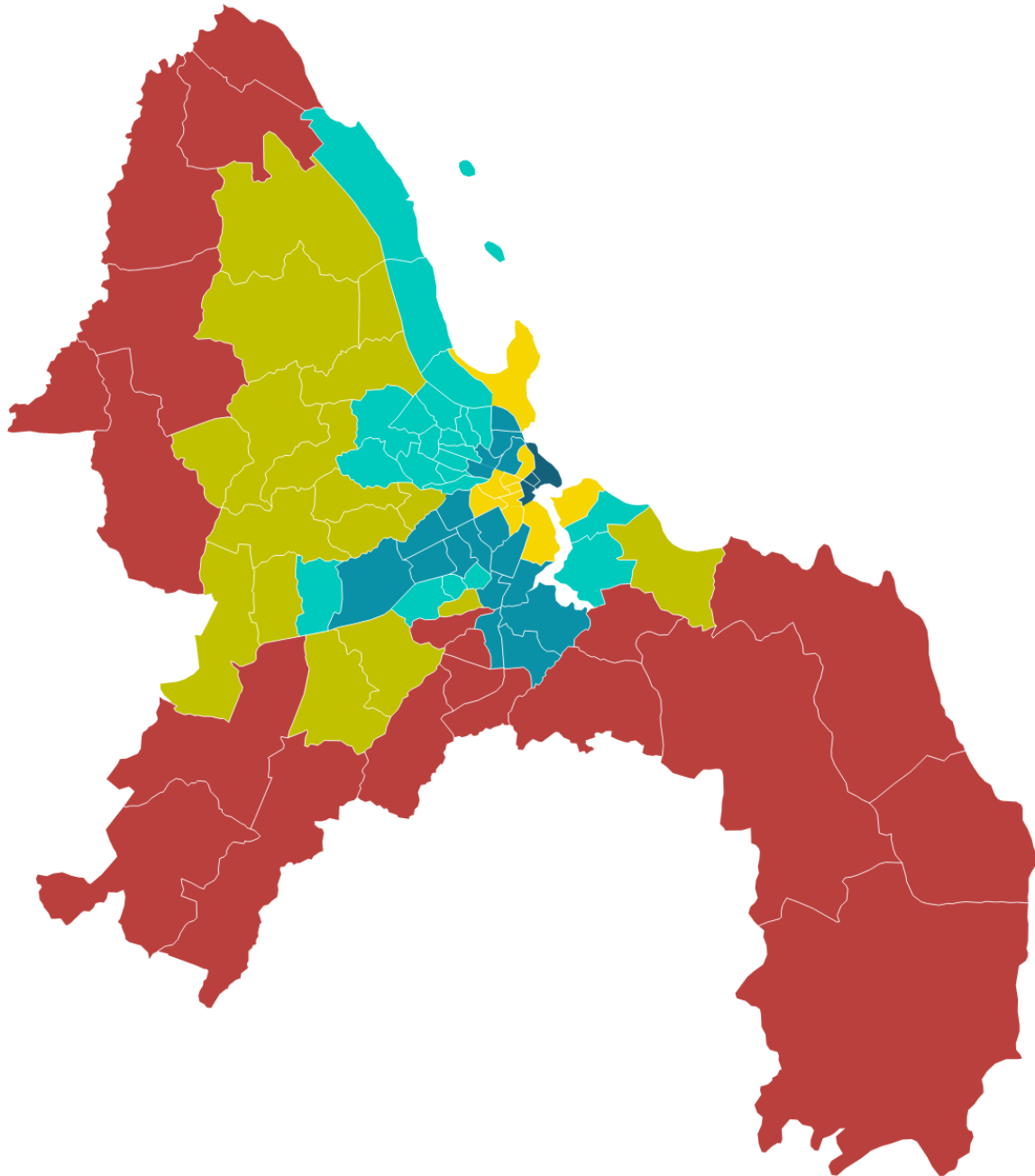
<sup>9</sup> Joelson, *The Tanganyika Territory*, 35.

<sup>10</sup> Cf. W.T. Casson, "Architectural Notes on Dar es Salaam", *Tanzania Notes and Records* 71 (1970), 181-184.

## Dar es Salaam Spatio-Political Dynamics

Expansion of Urban Dar es Salaam from 1891 to 1999

German   British - Interwar   British - Postwar   Dar to mid-1970s   Dar - 1970s-1990s  
Dar after 2000



Map: Frank Edward • Created with Datawrapper

**Figure 2.1:** A Map of Dar es Salaam after a Century of Growth  
*Source: Frank Edward, author.*



## 2.2 *Die Hauptstadt: German Dar es Salaam*

In 1983 a novelist William Boyd *An Ice Cream War*, a novel that described the proceedings and belligerence of the First World War in East Africa. One passage in the novel had the following paragraph on Dar es Salaam;

The Kaiserhof was in reality the railway hotel, built some six years before the commencement of the Dar–Lake Tanganyika central railway project. It was a stone building of some size topped with fake crenulations and it stood at the corner of Arabstrasse and Bahnhofstrasse. Behind Temple lay the harbour lagoon with its newly erected pier, Port Offices and customs sheds. Before him was the festering Indian town, made up of crumbling mud houses packed together in a maze of narrow fetid lanes. If he had walked to the east, continuing up Arabstrasse, he would have come to Unter den Akazien, the main commercial thoroughfare, where evidence of German neatness and efficiency was more apparent. Unter den Akazien's narrow, flamboyant-lined avenue led to the residential areas of Dar. Wooded, spacious roads, solid two- and three-storey stone colonial houses with red tiled roofs, and a large and beautifully laid out botanical garden.<sup>11</sup>

The quotation above provides a succinct portrayal of Dar es Salaam City during the German colonial era. It identifies some of the large technical systems such as roads, a port and railways. It identifies the German work and presence through street names, wide streets and zonal urban planning based on function – commercial and residential functions, for instance. It also identifies the socio-economic differences between the Germans and Indians through the design and materials of buildings – mud versus stone houses. It tells of a multiplicity of cultures – Arabic, Indian and German. It tells of important Dar es Salaam as an important economic city by identifying some economic activities such as trade, commerce and shipping. Last but not least, the quotation tells us that Dar es Salaam was already an important tourist destination at the beginning of the 20<sup>th</sup> century. However, the quotation does not say anything about the natives—the Africans—who were the majority in German East Africa, Germany's biggest colony. Did they live outside Dar es Salaam? Did they have streets? What were their houses built of? What was their role in the city?

The socio-economic history of German Dar es Salaam has tended to produce accounts of the Germans only, partly owing to the limitation of the sources. Most of the important sources were destroyed during the First World War (WWI) as German East Africa was the hottest battleground.<sup>12</sup> Dar es Salaam existed long before the advent of German colonialism in the 1880s.

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<sup>11</sup> William Boyd, *An Ice Cream War*. With an Introduction by Giles Foden (London: Penguin Books, 2010), 6-7; This soft-soaping of the German legacy in Dar es Salaam was presented by some British writers after the WWI. In F.S. Joelson, *The Tanganyika Territory: Characteristics and Potentialities* (London: T. Fisher Unwin Ltd., 1920), 20, for instance, the praise was lavished on the Kaiserhof Hotel as being the best hotel between Durban, South Africa and Port Said, Sudan.

<sup>12</sup> John Reader, *Africa: A Biography of the Continent* (London: Penguin Books, 1998), 599-600; Reginald E. Kirey, "Burying, Unearthing and Archiving German Colonial Records in Tanganyika, 1914-1960s", *Tanzania Zamani* 12, no. 2 (2020): 141-180.

It existed as a rural setting, an African rural area that lacked technological materiality connected to the wheel such as roads and railways, let alone most other large technical systems. Its population was small. The historian James Brennan estimates that, by the late 1880s, Dar es Salaam had about 4000 people.<sup>13</sup> David H Anthony III, a social historian of Dar es Salaam, contended that the town had about 5000 people by 1886.<sup>14</sup> The indigenous inhabitants of Dar es Salaam were the Zaramo people as well as pockets of the Shomvi people—Afro-Arab descendants—found in certain locations along the coastal areas. The Zaramo and Shomvi people were locally under the political control of Zaramo chiefs, the *Pazi*.<sup>15</sup> The *Pazi* was the title of any chief who ruled Dar es Salaam, which prior to the advent of German colonialism was known as Mzizima. The *Pazi* was assisted by a host of village headmen who were known as *Wandewa*. As the chiefs of most other coastal societies of East Africa, the Zaramo chiefs pledged allegiance to the Sultanate of Zanzibar beginning in the mid-19<sup>th</sup> century.

According to the historical anthropologist Lloyd W Swantz, the Zaramo and their Mzizima chiefdom were not popular and important until Sultan Majid of Zanzibar established a farm, a resting palace and a port in the city in the 1860s.<sup>16</sup> The archaeologist J E G Sutton asserts that it was because of the Sultan and the port that Mzizima attained the name Dar es Salaam, literally translated as the *Haven of Peace*.<sup>17</sup> It is reported that, upon building his palace and a small port, Sultan Majid called the place *Bandar-ul-Salaam*. Historians and archaeologists have translated it as the house or land of peace. Arabic sources from North and West Africa reveal that it is *Dar* which stands for ‘house’. Furthermore, the log of the current City Council and Persian sources reveal that *Bandar*, whose meaning is ‘port’, echoes the Swahili word *Bandari*, which has been borrowed from Persian.<sup>18</sup> As the port has calm waters and was used as a resting place for the Sultan of Zanzibar, Dar es Salaam became popularly known as the *Haven of Peace*. Indeed, in the first decade of independence, the post-colonial government re-installed the name Mzizima for a district of which Dar es Salaam City was a part. Following the changes in local government boundaries in Coast Region in the early 1970s, Dar es Salaam replaced Mzizima as the district’s name, and later it became the name of the entire region. The submission of the Zaramo to the powerful Sultan of Zanzibar in the 19<sup>th</sup> century

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<sup>13</sup> James R. Brennan, “Nation, Race and Urbanization in Dar es Salaam, Tanzania, 1916-1976” (PhD diss., Northwestern University, 2002), 9; Lord Hailey, *Native Administration in the British African Territories: Part I. East Africa – Uganda, Kenya, Tanganyika* (London: His Majesty’s Stationery Office, 1979[1950]), 338.

<sup>14</sup> David Henry Anthony III, “Culture and Society in a Town in Transition: A People’s History of Dar es Salaam, 1865-1939” (PhD Diss., University of Wisconsin-Madison, 1983), 75.

<sup>15</sup> See, for instance, a story of one of the Zaramo Pazis during the famous Maji Maji War in Reader, *Africa*, 591.

<sup>16</sup> Lloyd W. Swantz, “The Zaramo of Dar es Salaam: A Study of Continuity and Change”, *Tanzania Notes and Records* 71 (1970): 157-164.

<sup>17</sup> J.E.G. Sutton, “Dar es Salaam: A Sketch of a Hundred Years”, *Tanzania Notes and Records* 71 (1970): 1-19.

<sup>18</sup> Cf. D.T. Niane, ed., *General History of Africa Vol. IV: Africa from the Twelfth to the Sixteenth Century* (California: Heinemann, 1984).

meant that Mzizima could not be attacked or subdued by any social group and if it was attacked or subdued, the Sultan would send his army to defend it. Thus, when the Germans were laying colonial claims over Dar es Salaam in the late 1880s, they had to seek the consent of the Sultan and purchase the land from the Sultan. The purchase, which resembled the purchase of some states in the south and west of the United States of America, is discussed in Chapter III.

The Zaramo people were traditionally small-scale agricultural producers who supplemented their livelihoods with fishing in the Indian Ocean and hunting in the nearby hinterland wilderness. They had their traditional religion which formed the core of the “matrilineal social system”. As was the case with other coastal societies that fell under the influence of the Sultan of Zanzibar, the matrilineal social system was gradually transformed into a patrilineal social system because of the penetration of Islam.<sup>19</sup> The Zaramo undertook commercial exchanges with the Arabs and the Shomvi people. At the peak of the caravan trade in East Africa, the Zaramo are reported to have exchanged slaves and some wildlife products with the two merchant groups in return for iron and cloth material.<sup>20</sup> They conducted their business through barter exchange as there was no currency. In what J A K Leslie considers as the purchase of Dar es Salaam from the Zaramo by Sultan Majid, for instance, cloth was given to the Zaramo chiefs as money.<sup>21</sup> Like in all East and Central Africa, the major means of transporting goods and people with higher social and political status was human portage. It is no wonder then that, when the defenders of colonialism justified the colonialism, they drew insights from the technological systems that African societies like the Zaramo had and did not have prior to and during the colonial period.<sup>22</sup> The modernity studies have, thus, analytically summarised the associated colonial modernisation as *contagious*, that is, modernity through contact.<sup>23</sup> Contagionists interpreted modernity in terms of circulated Western technologies such as roads, drainage, power and railways, most of which were installed in colonial cities like Dar es Salaam.<sup>24</sup> They made comparisons through a balance sheet using two binaries, pre-colonial and colonial urban Africa. On the modernity through contact thesis, African agency was significantly downplayed in favour of the European agency, thereby cementing the colonial narratives of African history.

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<sup>19</sup> Swantz, “The Zaramo,” 157.

<sup>20</sup> *Ibid.*, 158.

<sup>21</sup> J.A.K. Leslie, *A Survey of Dar es Salaam* (London: Oxford University Press, 1963), 19.

<sup>22</sup> See the discussion on the balance sheet of pros and cons of colonialism in Africa in Walter Rodney, *How Europe Underdeveloped Africa* (London: Bogle-L'Ouverture, 1972).

<sup>23</sup> Jan-Georg Deutsch, Peter Probst and Heike Schmidt, eds, *African Modernities: Entangled Meanings in Current Debate* (Portsmouth & Oxford: Heinemann, James Currey, 2002).

<sup>24</sup> Aidan Southall, “The Impact of Imperialism upon Urban Development in Africa”, in V. Turner ed., *Colonialism in Africa 1870-1960: Profiles of Change*, Vol. 3. (Cambridge: Cambridge University Press, 1971), 243.

Following the purchase of Dar es Salaam from the Sultan of Zanzibar in 1890 and the change of German East Africa colonialism from company to state colonialism,<sup>25</sup> Dar es Salaam was selected as the site for building the capital of the territory. In the following two-and-half decades, the city functionally served as an administrative, political and economic capital for the whole territory.<sup>26</sup> But this came after the Germans broke the ties between the Sultan of Zanzibar and the Zaramo by imposing their control on the latter and by allowing the Christian missionaries to operate among the Zaramo. As a result, some Zaramos became Christians, whereas the majority remained Muslims.<sup>27</sup> Despite the penetration of Islamic and Christian religions in Uzaramo, some aspects of traditional religious cosmology persisted. The Zaramo practised religious syncretism. The German penetration and capital establishment also meant that some of the Zaramo became urbanites. In actual fact, the majority of the Zaramo continued with their rural lifestyle inhabiting the areas surrounding the newly established town. In Dar es Salaam, the city was established in an area that did not exceed 15 square kilometres.

The making of the capital was not a one-day event. Even the making of the city plans underwent several processes and took some time before they became legible and implementable. It took almost two decades for Dar es Salaam to stabilise and become a significant urban setting. Although historians and social scientists like James Brennan and Andrew Burton,<sup>28</sup> Franck Raimbault,<sup>29</sup> Lusugga Kironde<sup>30</sup> and Karl Vorlauffer<sup>31</sup> have discussed the shift of the capital from Bagamoyo—a territorial capital during the period of company colonial rule—to Dar es Salaam, none of them explained further the gradual consolidation of the new capital in comparison to the former capital. It is only the historians John Iliffe and Jürgen Becher who conduct a small comparative analysis of Dar es Salaam and Bagamoyo. Demographically, Bagamoyo had between 10,000 and 15,000 people during the 1890s, two to three times the population of Dar es Salaam. “Popularly known as Little Potsdam, the capital contained some 20,000 people at the turn of the

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<sup>25</sup> John Iliffe, *Tanganyika under German Rule, 1905-1912* (Cambridge: Cambridge University Press, 1969), 28.

<sup>26</sup> Jürgen Becher, *Dar es Salaam, Tanga und Tabora: Stadtentwicklung in Tansania unter deutscher Kolonialherrschaft* (Stuttgart: Franz Steiner, 1997), 27.

<sup>27</sup> Swantz, “The Zaramo,” 158.

<sup>28</sup> James R. Brennan and Andrew Burton, “The Emerging Metropolis: A History of Dar es Salaam, circa 1862-2000” in J.R. Brennan, A. Burton and Y. Lawi, eds., *Dar es Salaam: Histories from an Emerging African Metropolis* (Dar es Salaam: Mkuki na Nyota, 2007).

<sup>29</sup> Franck Raimbault, “The Evolution of Dar es Salaam’s Peri-Urban Space during the Period of German Colonisation (1890-1914)” in B. Calas, ed., *From Dar es Salaam to Bongoland: Urban Mutations in Tanzania* (Dar es Salaam: Mkuki na Nyota, 2007).

<sup>30</sup> Lusugga Kironde “The Evolution of the Land Use Structure of Dar es Salaam 1890-1990: A Study in the Effects of Land Policy” (PhD. Thesis, University of Nairobi, 1994)

<sup>31</sup> Karl Vorlauffer, *Koloniale und nachkoloniale Stadtplanung in Dar es Salaam* (Frankfurt: Johann Wolfgang-Goethe-Universität Frankfurt/Main, 1970).

century.”<sup>32</sup> This means that the capital’s population grew relatively fast and surpassed that of Bagamoyo within a decade. Similarly, the commercial significance of Bagamoyo continued to be great until the beginning of the 20<sup>th</sup> century because the caravan trade continued utilising its port. The port of Dar es Salaam was being used for importing and exporting government goods only. These economic and demographic developments should be interpreted in connection with the increase in the number of infrastructure projects which began in the capital and spread to the hinterland in the first decade of the 20<sup>th</sup> century. For instance, the central railway and road projects began in 1905 and required a large number of personnel – labourers and professionals – hence more population and trading activities.<sup>33</sup>

An old urban scholar, Aidan Southall, attributed the development of “Dar es Salaam’s stable urban settlement with the German occupation.”<sup>34</sup> His assertion is based on a number of strong reasons. The first inhabitants of urban Dar es Salaam were German officials and soldiers, as well as foreign and locally recruited African soldiers and labourers. Historical and social science works on urban Dar es Salaam do not explain why Africans never resisted being forced to live in planned streets and in appropriating new house designs. Since most of them were non-native, it was sociologically easy for such Africans to be settled in planned settlements as they lacked a sense of belonging. Andrew Burton says that the Germans maintained close supervision to ensure that Africans complied with the new spatial order.<sup>35</sup> The people living in planned settlements, provided under the leasehold tenure by the Germans, was an attempt by the latter to forge new beginnings and put nativity concerns to rest. Some of the Africans were mercenaries from Sudan and South Africa.<sup>36</sup> Others were migrant labourers from the hinterlands of German East Africa. It should be emphasised here that the Germans treated all urban Africans as an undifferentiated social category, unlike the British who had imbued the divisive element of tribalism so that they could rule them easily. The British were known for using the divide-and-rule policy in their colonies.

Another social category in German Dar es Salaam was the Asian group that consisted of Indians and Arabs. The Arabs were few and invariably intermingled socially with Africans in the African neighbourhoods. The Germans never had scruple over the Arabs enough to use them in the local administration as *Livalis* and in the army as *viroboto*—a nickname of Arab soldiers in the colonial era. Thus, it is not surprising that, during the German and British colonial periods, Arabs

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<sup>32</sup> John Iliffe, *A Modern History of Tanganyika* (Cambridge: Cambridge University Press, 1979), 128-129.

<sup>33</sup> *Ibid.*, 136.

<sup>34</sup> Southall, “The Impact of Imperialism,” 236.

<sup>35</sup> Andrew Burton, *African Underclass: Urbanisation, Crime & Colonial Order in Dar es Salaam* (Dar es Salaam: Mkuki na Nyota, 2005), 45.

<sup>36</sup> Cf. P.H.C. Clarke, *A Short History of Tanganyika: A Mainland of Tanzania*. 2<sup>nd</sup> Edn. (Arusha: Longmans, 1966), 96.

were socially and racially treated as Africans. Arabs were okay with such treatment for many decades. They only contested the treatment in times of adversity such as in 1943 when the wartime food rationing that caused them to buy little portions of imported and scarce foodstuffs in the ways prescribed for the African urban population.<sup>37</sup> The Arabs wanted to have the same status as the Indians and Europeans who were allowed to purchase bigger portions of food.<sup>38</sup> Beyond events of the day, the Arab reaction may also be interpreted as a manifestation of a deepening impact of the divide-and-rule policy, which had imposed and consolidated social identities. Unlike the Indians, the Arabs have continued intermingling with Africans in many ways. Unlike the Arabs, the Indians — who were notable for their social exclusivity, late immigration, commercial competitiveness against the European merchants and their connection to the British — were treated as foreigners without any citizenship rights. Most of the Indians were merchants or belonged to merchant families. Some historians have uncovered records that reveal German settlers putting much pressure on the German colonial state in Dar es Salaam so that Indians could be expelled from the colony. The Whites hated the Indians for “hoarding every cent gained” in trading and for shipping their “hoarded wealth to the land of [their] birth,” instead of investing in and benefitting the territories in which they were doing business and living.<sup>39</sup> The state, however, did not expel them, but restricted Indian rights in the territory.<sup>40</sup> In Dar es Salaam, for instance, the European commercial street was cleaned and furnished well with infrastructure, unlike the adjacent Indian streets. The provision and maintenance of infrastructure in the Indian streets was rectified, or rather, improved upon during the British colonial period. The fact that the Indians were treated as Asians, and therefore foreigners, poses a challenge to the assertion made by the historian James R Brennan in 2002. Brennan argued that Indians were classified as ‘natives’.<sup>41</sup>

The everyday administration of Dar es Salaam was under the *Bezirksamtman*, the district commissioner, as was the case with the other districts in German East Africa.<sup>42</sup> However, in Dar es Salaam and Tanga there were district urban councils, since they were the only cities in the territory. While the district council of Tanga was under the *Bezirksamtman*, that of Dar es Salaam was under the Governor. The Dar es Salaam council, or the *Stadtgemeinde*, comprised five appointees

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<sup>37</sup> British National Archives (BNA), CO691/181: Tanganyika: Petitions and Memorials – Petition by the Arab Association

<sup>38</sup> Tanzania National Archives (TNA), 61/547/13/17: Food Control and Rationing – Dar es Salaam Township.

<sup>39</sup> Joelson, *The Tanganyika Territory*, 28.

<sup>40</sup> Iliffe, *Tanganyika under German*, 93-95.

<sup>41</sup> James R. Brennan, “Nation, Race and Urbanization in Dar es Salaam, Tanzania, 1916-1976” (PhD Diss., Northwestern University, 2002), 20.

<sup>42</sup> Clarke, *A Short History*, 105.

of the Governor. All the appointees were Europeans.<sup>43</sup> The council was responsible for all the affairs of the city – health, infrastructure, spatial planning, education and taxation. Given the Governor’s keenness and the fact that it was the *die Hauptstadt* of German East Africa, Dar es Salaam’s infrastructure and other general concerns were given more paramount significance and attention than those of the other areas in the territory. In 1907, the Governor of German East Africa lamented in a letter to the Colonies Office in Germany that Dar es Salaam had progressed much more than the other districts in the territory.<sup>44</sup> With the letter, the Governor was demanding more funds from the German government for developing the other districts in territory. It appears that his predecessors as well as the Berlin government were concerned more with the progress of Dar es Salaam than of the other districts.

German Dar es Salaam was a small area but a very well furnished as a capital and as a city. Its boundaries were not expanded as the population was relatively small. Most streets bore German names such as Kaiserstraße and Bismarckstraße. The width of the streets was almost the same throughout the planned area. However, trees for beautifying the city were planted in government streets and in the European residential streets. A botanical garden was also established for testing plant species from abroad as well as for collecting plant species from across German East Africa.<sup>45</sup> Public cleaning was also done in the government, commercial and European streets, leaving the African and Asian areas to the residents themselves. Writing of such streets and buildings, the historian Albert Calvert described them as “clean” and “neat”.<sup>46</sup> It was possible to maintain the cleanliness of the European streets because the European community was small and capable of hiring labourers or utilising labour gangs made available to them by the government. The labour gangs were used in maintaining the streets and building roads at a time when the attempt to substitute porters with animals such as horses, mules and oxen had been made impossible by the tsetse flies.<sup>47</sup>

The European community that peopled Dar es Salaam comprised the top government bureaucrats, civil servants, soldiers, merchants and farmers. Some Europeans owned a few industries. The historian Rodemann has noted the presence of the Schulz brewery and “a textile dye company,” which “prospered.”<sup>48</sup> This group was economically and politically powerful.

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<sup>43</sup> H. William Rodeman, “Tanganyika, 1890-1914: Selected Aspects of German Administration” (PhD Diss., University of Chicago, 1961), 85-86.

<sup>44</sup> A letter from Rechneberg to Reichskolonialamt cited in John Iliffe, “The Age of Improvement and Differentiation (1907-1945)” in I.N. Kimambo and A.J. Temu eds., *A History of Tanzania* (1997) [1967], 134.

<sup>45</sup> G.L. Steer, *Judgement on German Africa* (London: Hodder and Stoughton Ltd, 1939), 7.

<sup>46</sup> Albert F. Calvert, *German East Africa* (London: T. Werner Laurie Ltd., 1917), 105.

<sup>47</sup> See, for instance, in Rodemann, “Tanganyika,” 208-9.

<sup>48</sup> *Ibid.*, 188-9.

Political and economic powers usually translate into higher social status and influence for an individual or a group. The Africans and Asians were permitted to walk in such streets until 10 pm, after which they were not allowed to do so on security grounds. This means that the Germans were not racially rigid like the British who installed the *cordon sanitaire* in the mid-1920s.<sup>49</sup> Generally, the Germans in Dar es Salaam were more liberal than those in the cities of the other German colonies of Cameroon, Togo and Namibia.<sup>50</sup> Even within German East Africa, the Germans who were in urban Dar es Salaam were more liberal and friendlier to the Africans than those who lived in rural hinterlands. The differential treatment and temperament within the German colonial empire are emphasised here as something that can help to build a counter-argument against the existing literature on Dar es Salaam.

### 2.3 British Dar es Salaam

The British hegemony in Dar es Salaam officially began in 1919. This was after the former German East Africa had been handed over to the mandate of the League of Nations. German East Africa was renamed Tanganyika during British colonial rule, and Dar es Salaam city retained its capital status. The British appropriated the German residential and government buildings. The use of the buildings continued to be the same as it was during the German colonial era. In short, they inherited the urban technological legacy of the Germans. The change was not only political as the statements made above might imply. Its change was also spatial, economic, social and technological. The urban technological change is a subject of the other chapters. To appreciate the British colophon in Dar es Salaam, I split the analysis into two temporal categories: the interwar and the post-war period.

Politically, during the interwar period, Dar es Salaam continued to have its political significance. Like in the German colonial era, Africans were not represented in the city administration. Between 1918 and 1926, the upper hierarchy of Tanganyika administered the city directly, with the main focus being on restoring the war-ravaged infrastructure. Restoration here means infrastructure repair and maintenance. The emphasis on restoration of urban infrastructure at the expense of building is associated with the fact that Tanganyika was a mandate colony of the League of Nations which the British controlled with little interest. The mandate status made the British to underinvest not only in infrastructure building but also in urban governance. The consequence on the latter was marked by change in the status of Dar es Salaam. Using their urban spatial ranking nomenclature, the British considered Dar es Salaam too small to be called a city—

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<sup>49</sup> Iliffe, “The Age of Improvement,” 144.

<sup>50</sup> For comparison with Togo see in Andrew Zimmerman, *Alabama in Africa: Booker T. Washington, the German Empire, and the Globalization of the New South* (Princeton, Princeton University Press, 2010).



a status it had during the German colonial period. The change was influenced by the desire to reduce costs of city administration as well as to come to terms with shortage of manpower. To achieve the change from city to township status, the British used the *Township Ordinance* of 1920.<sup>51</sup> Consequently, the British records on Dar es Salaam for the period between 1920 and 1950 used the term ‘township’ to reflect the change. However, this status seems to have been at odds with some colonial officials during the interwar period. In the 1930s, for instance, some officials tended to call Dar es Salaam a municipality to the extent that some of the file headings had the word ‘municipality’ instead ‘township’.<sup>52</sup> Additionally, when the township administration was reorganised in 1932, the position of executive officer was replaced by that of ‘municipal secretary’.<sup>53</sup> As such, Dar es Salaam became a *de facto* municipality in the 1930s and attained a *de jure* municipality status in 1949.

The administration of the township was directly under the medical officers for over a decade. They served as executive officers as well as chairpersons of land planning committees. Even when they were replaced by district officers in 1932, the medical officers continued to have much influence on the town.<sup>54</sup> They were the most powerful actors in everyday urban governance in the colonies unlike in the Global North municipal administrations. For instance, in North America and Western Europe, engineers were the dominant actors after the lawyers and economists, but medical doctors were less important in the administration of cities.<sup>55</sup> Brennan opines that medical officers were important actors in the colonial governance of the township, since they were the first professional actors to arrive in Dar es Salaam. They arrived in 1916 and knew the township better than the district officers and other actors like the engineers.<sup>56</sup> Archival records show that the medical officers were dominant not only in the local administration of Dar es Salaam but also in the governance of the territory. The Director of Medical and Sanitary Services Department (DMSS) was third in territorial administration ranking after the Governor and Chief Secretary. In some instances, DMSS John Scott acted as Governor in the 1920s when the *de facto* governor was away or on leave.<sup>57</sup> The annual reports of the medical and public works departments released between 1921 and 1945 indicate that the medical officers were at first happy with their

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<sup>51</sup> United Republic of Tanzania, *The Population of Tanzania: An Analysis of the 1967 Population Census* (Dar es Salaam: BRALUP and Bureau of Statistics, 1973).

<sup>52</sup> Cf. TNA File no. 22307: Municipalities, Establishment of

<sup>53</sup> Letter from Chief Secretary to District Officer dated 30.05.1932 in TNA Accession no. 61/602: Township Authority Reorganisation.

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

<sup>55</sup> Andrew Karvonen, *Politics of Urban Runoff: Nature, Technology and the Sustainable City* (Cambridge and London: The MIT Press, 2011), 4.

<sup>56</sup> Brennan, “Nation, Race and Urbanization”, 23-4.

<sup>57</sup> BNA, CO 736: Tanganyika Territory – Executive Council Minutes, 1920-1934.

position. With the township expansion which began in the late 1920s, more duties fell on them such that they were disenchanted with their powers and the preferential treatment they received from the senior colonial hierarchies. In a medical report of 1929, for instance, the medical officers complained that they had responsibilities that went beyond their professional realm. Apart from administering the township, they were also responsible “[for] the supervision and maintenance of all works of an engineering nature.”<sup>58</sup> The engineers were not either happy about their professional duties in the township being managed by the medical officers. Their dissatisfaction was recorded in the reports of Public Works Department (PWD) of 1937, which called for PWD institutional reorganization that eventually took place in 1938.<sup>59</sup>

The other British vestige was the expansion of the township boundaries. The township boundaries were in tandem with the introduction of the racial spatial planning. Unlike the Germans, the British pushed the Africans out of the pre-war city. Historians and other urban scholars have argued that racial, spatial planning was a German bequest. They invariably anchored their arguments on the building codes. A prominent British historian on Tanzania, John Iliffe, contends that “the Germans began in 1912 to divide the town into three racial ‘building zones’” and that “the British completed the scheme after 1918.”<sup>60</sup> On the contrary, this work suggests that such a position is not tenable and may require further research. This suggestion is based on several grounds. First, the timing of the German racial planning indicates that the plan was not implemented as the First World War was looming large. This position is supported by the historian James R Brennan, who has argued that the Germans left the plan on paper.<sup>61</sup> The second is the fact that the Germans in Dar es Salaam were coincidentally more liberal than the Germans in other parts of German East Africa and other colonies. They wanted to implement municipal socialism in city building but understood that the inhabitants of the city belonged to different economic classes. As such, they introduced building codes that defined building materials and designs with reference to the socio-economic classes of Dar es Salaam denizens. Consequently, the economically disadvantaged group – the Africans – found itself in an area of its own as early as the 1890s. The vice versa was true for the European and Asian (Indians) groups. Furthermore, saying that the Germans were considering racial segregation in 1912 is another piece of evidence that the city’s master plan and general policy of the Germans were not racial from 1891. This counters what many

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<sup>58</sup> Tanganyika Territory, *Annual Report of the Medical and Sanitary Services for the Year 1929* (Dar es Salaam: The Government Printer, 1930), 46.

<sup>59</sup> BNA, CO691/168/7: Public Works Department – Reorganisation; Edward and Hard, “Maintaining the Local Empire.”

<sup>60</sup> Iliffe, *A Modern History*, 385.

<sup>61</sup> Brennan, “Nation, Race and Urbanization”.

other works have contended, that is, the Germans in Dar es Salaam were outright racist in the development of the city.

In contrast, the British were for a long time infamous for being racist in their spatial planning in all their colonies. It follows that the British racial segregation in township planning was not a mere implementation of the German plan; rather, it was a circulation of the practices and policies that had been tested and proven elsewhere, particularly in India.<sup>62</sup> Planning was a tool for social ordering in which race and class categories were fused to mould a new social differentiation. The implementation racial planning removed Africans from their plots – *Kiwanja* Tenure – allotted by the Germans and resettled them to the modern-day area of Kariakoo. The Indians were given the plots that used to belong to the Africans and the two racial groups were separated by a *cordon sanitaire* which, throughout the British colonial period, remained an open space with a width of more than 270 metres. The Germans never introduced the *cordon sanitaire*. The Canadian spatial planners for Dar es Salaam asserted in 1968 that the “the biggest single development” of the British in the interwar era was “the creation of the ‘Mnazi Mmoja’, an open space, as a ‘cordon sanitaire’.”<sup>63</sup> The *cordon sanitaire* was made by legal but forceful eviction and demolition of African houses. As an example of legal instrumentalisation in the making of the *cordon sanitaire*, the 1933 Land Department report contained this passage:

Where persons who had occupied plots on Kiwanja Tenure refused to accept rights of occupancy to vacate the land, civil action was taken to obtain their eviction, and during the year ejection orders were made by the Court against 23 persons in unlawfully occupation of public land. It was necessary to take similar action in the clearance of neutral zone between the business area of the township and the native quarter. At the end of the year this zone, known as the “Open Space”, had been cleared of all but 13 buildings.<sup>64</sup>

While the Africans were separated from the other racial groups by the *cordon sanitaire*, the Asians, who were bordered by the Europeans, were separated by a road. The British were implementing a segregationist policy that gave preferential treatment to the Europeans and Asians at the expense of the Africans. Capitalising on the economic factor, Sir Donald Cameron, justified this treatment when he said that “the Indian position generally, from the point of view of wealth, is just as important as the European British.” This position was contrary to the British official policy and Article 22 of the Covenant of the League of Nations that demanded putting African interests above the interests of all others.<sup>65</sup>

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<sup>62</sup> See Curtin, “Medical Knowledge and Urban Planning”.

<sup>63</sup> URT, *Dar es Salaam National Capital Master Plan: TS 2 – Planning Studies* (Toronto: Project Planning Associates Limited, 1968), 7.

<sup>64</sup> Tanganyika Territory, *Annual Report of the Land Department 1933* (Dar es Salaam: The Government Printer, 1934), 8.

<sup>65</sup> *Recent Progress in Tanganyika: Address by His Excellency Sir Donald Cameron to the Committee of the Empire Parliamentary Association on 25<sup>th</sup> March, 1931*, Westminster Hall, London.

Notwithstanding the paradoxical position in which they found themselves, the British carried on with their crusade of making Indians the rightful citizens of the township when they incorporated “commonly wealthy professional or businessmen” into the executive administration of Tanganyika and Dar es Salaam. Dr S B Malik – who later became mayor of Dar es Salaam Municipal Council in the late 1940s and early 1950s – was appointed together with A A Adamjee, V M Nazerali and Karimjee Jivanjee to the Executive Council in 1939 and to the township authority in 1941.<sup>66</sup> Throughout the interwar period, the natives were not represented by an African. Until the mid-1950s, a European was appointed by the Governor to represent the Africans. Racial segregation was manifested not only in residential patterns but also in the administrative, health, infrastructure, education and housing sectors. The design and reportage of housing problems, the making of population centres, the building and designing of workers’ houses, the political representation, the taxation system and the education system all reflected the tripartite racial system – Africans, Asians and Europeans.

The first township boundary extension was made between 1920 and the early 1930s. This phase involved redrawing the township plan so as to evict from German city and relocate Africans. The new plan was drawn in 1925, as shown in Chapter III. Plots were surveyed and sold to Africans. This marked the beginning of the racist planning involving legal and forceful processes as evinced from the land report quoted above. This sort of planning was consolidated by the *Land Ordinance* of 1923 that declared all lands in Tanganyika to be public and to be under the control and subject to disposition of the Governor.<sup>67</sup> The area that was incorporated into a new township boundary was Kariakoo, west of the former German city, which prior to WWI used to be a farm. The second boundary extension took place between 1927 and 1932. The purpose of this expansion was to add a European residential area to the surveyed area called Oyster Bay. The decision was made in 1927 because of a shortage of housing for the European administrators and businessmen. The drawn plan involved constructing the Selander Bridge across the Msimbazi creek to connect the proto-city with new suburb in the north.<sup>68</sup> The construction of the bridge began in 1929 and was completed in 1931.<sup>69</sup> Unlike the first extension, the second boundary extension was made before being gazetted because the Executive Officer of the township authority had earlier objected to its inclusion in township area for health-related reasons because Oyster Bay was infested with

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<sup>66</sup> Iliffe, *A Modern History*, 374.

<sup>67</sup> United Kingdom, *Report on Tanganyika Territory to the League of Nations for the Year 1927* (London: His Majesty’s Stationary Office, 1928), 69.

<sup>68</sup> United Kingdom, *Report on Tanganyika Territory to the League of Nations for the Year 1929* (London: His Majesty’s Stationary Office, 1930), 5;

<sup>69</sup> Tanganyika Territory, *Annual Report of the Public Works Department for the Year 1929* (Dar es Salaam: The Government Printer, 1930), 6.

mosquitoes and flies. However, the Chief Secretary of Tanganyika did not agree with the objection and thus compelled the Executive Officer to redraw the plan and approve Oyster Bay as part of township.<sup>70</sup> Throughout the interwar period, this was the only period in which the medical officers' advice was flouted by the higher colonial administrators.

Apart from the formal township boundary extension, there were also informal urban expansion processes propelled from below. Beginning in about 1930, the Africans started forming small neighbourhoods outside the formal township boundaries. The first was the Ilala neighbourhood which, to the British colonial officials, looked like a village. Ilala was formed in 1931 by Africans who could not purchase plots in Kariakoo.<sup>71</sup> Another neighbourhood, which was established during the interwar period, was Keko. Whereas Ilala comprised mainly Africans from the vicinity of the Dar es Salaam township, Keko was home to Africans from the hinterlands of Tanganyika.<sup>72</sup> The inhabitants of the two neighbourhoods were employees of the government and private organisations or companies in the township centre. They were attended to by the township authority like those within the old township. One example was the numerous anti-malarial programmes executed in Keko during the 1930s.<sup>73</sup> Furthermore, their populations grew fast such that by 1950s they had overtaken Kariakoo as one of the dominant African wards. It is not surprising that Ilala became the major intra-city bus destination in 1949 when public transport was established in Dar es Salaam.

The establishment of these two neighbourhoods was the first attempt – a state-sanctioned attempt – to build informal settlements in the history of Dar es Salaam. Whereas Ilala was rebuilt in the late colonial and post-colonial periods and ultimately become formal, Keko has largely remained informal. The neighbourhoods were not created in opposition to the colonial urbanisation processes. They were built because some Africans were not economically able to live in the planned area during the British colonial period. Some, however, moved to Ilala and Keko after selling or leasing their plots and houses in Kariakoo. Most of the sales and leases targeted the Indians. The Indians who moved to Kariakoo were merchants who sought to tap into the vibrant African market. Brennan describes this phenomenon as a silent but active defiance against strict racial segregation that had been imposed by the British through the zoning system. Put bluntly, the Indians were gentrifying Kariakoo and consequently raising the value of plots and rents. “This Indian-led gentrification ... proved irresistible to higher officials,”<sup>74</sup> thus making Kariakoo one of

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<sup>70</sup> TNA, Open Accession: Dar es Salaam District Report for the Year 1931, 42; Letter from Executive Officer to Chief Secretary dated 17.04.1931 in TNA, 61/403/Vol.I: Township Boundaries – Dar es Salaam Extension of.

<sup>71</sup> TNA, Open Accession: Dar es Salaam District Report for the Year 1931, 23.

<sup>72</sup> Weston Bodleian Library, Microfilm, Reel No. 13: Dar es Salaam Extra Provincial District Book V.I-II

<sup>73</sup> Tanganyika, *Second (Final) Report of the Malaria Unit*.

<sup>74</sup> James R. Brennan, *Taija: Making Nation and Race in Urban Tanzania* (Athens: Ohio University Press, 2012), 37-46

the earliest typical cosmopolitan neighbourhoods in Dar es Salaam. Despite this gentrification, the state of infrastructure in Kariakoo continued to be underdeveloped in stark contrast to the state of infrastructure in Zones I and II which, by the 1930s, already had street lights, a fairly improved water supply, better drainage and traffic infrastructure. The British colonial administrators admitted in 1946 that there were “many complaints of inadequate lighting, drainage” and other infrastructural services from the urbanised Africans in Dar es Salaam, complaints that needed a positive response in the post-war era. Lord Hailey and Mr Cox, for instance, believed that the complaints would end when the Township Authority became a Municipal Council.<sup>75</sup>

Had it not been for the economic potential of Kariakoo area, the Indians would not have defied racial segregation as they were known for living a secluded life. As a matter of fact, when the British expanded the Indian residential area in the 1950s, particularly through the Upanga scheme,<sup>76</sup> the Indians, who had settled in Kariakoo, did not leave their premises, for they were commercial-cum-residential buildings. Moreover, the initial plan to develop the Upanga area did not target the Indians who had gentrified Kariakoo. Rather, it targeted the Indians who were living in the old commercial centre as they had overpopulated the area, an overpopulation that made the area ideal for the eruption of health epidemics.<sup>77</sup> Targeting the Indians in the township centre implied that the British had come to terms with gentrification of Kariakoo, a contradiction to their own racial policy and to the Indian self-seclusion.

It is important to note that, whereas German urbanisation introduced Africans to urban cultures and new property relations, the British introduced the urban Africans to commercialised infrastructural services. The commercialisation of the services related to the utilities like water, power and sanitation, but not traffic and drainage infrastructure. In 1933, the colonial officials were so alarmed by the speedy commercialisation of water that they thought “it would be necessary to take steps to prevent the removal of water for sale by the *wa-zega-zega*.”<sup>78</sup> This commercialisation turned some people in the African neighbourhoods into ‘human infrastructures’ who replaced water pipes, since there was no readily available water supply. Such people were known as *wazegazega*, literally meaning people who hobble when they are carrying two water jelly cans on their shoulders for sale. This scenario predates the recent analysis of a prominent African urban scholar, AbdouMaliq Simone, who believes that the ‘people as infrastructure’ phenomenon is a recent urban

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<sup>75</sup> Notes on Eastern Province – Tanganyika by Lord Hailey and Mr. Cox in BNA CO 1018/69.

<sup>76</sup> United Kingdom, *Report to the United Nations on the Administration of Tanganyika Territory for the Year 1949* (London: His Majesty’s Stationery Office, 1950), 153-154.

<sup>77</sup> TNA, 61/4/15: Housing in Zone 2 – Dar es Salaam Township.

<sup>78</sup> Letter from Director of Medical and Sanitary Services to the Senior Health Officer, Dar es Salaam dated 23<sup>rd</sup> September, 1933 in TNA 61/622: Public Bathing Places.

development in the Global South.<sup>79</sup> Undeniably, European capitals like London had individuals who worked as water carriers in the period between the 12<sup>th</sup> and 19<sup>th</sup> centuries, the era of pre-networked water supply systems.<sup>80</sup> Dieter Schott, an environmental historian, argues that water carriers were a professional group that responded to the water shortages caused by a rapid population growth in European cities and towns.<sup>81</sup> In Dar es Salaam, however, this was caused by an intentionally limited provision of piped water to the African zones. Another kind of commercialisation which Africans might have learnt about during the interwar period is house-renting. As shown earlier, some Africans in Kariakoo had been leasing their houses to the Indian merchants. They became the first African landlords in the city. Sociologically, the Africans who participated in this business might have gained certain social powers and status. Historians might need to investigate its significance and how it evolved in the later periods.

The second and extensive expansion of the township boundaries during the British colonial period occurred in the post-WWII period. Whereas the interwar expansion had involved the African (Zone III) and European (Zone I) areas, the post-war expansion involved all the zones in the township. One of the manifestations that population was increasing in all the zones and creating pressure on the government and the township was the establishment of housing schemes after 1945. The housing schemes covered all the racial groups after several debates within the colonial circles. New neighbourhoods emerged outside the pre-WWII township boundaries. These were Magomeni, Kinondoni, Chang'ombe and Temeke. Although the post-war housing scheme covered all three zones, it was implemented inequitably because of racism as well as the colonial assumption that Africans were transient residents of urban areas who did not need decent, permanent housing.<sup>82</sup> The European and Asian houses were in the centre of the city; they were spacious and located in low- and medium-density areas, whereas African houses were in small, high-density areas. Asian and European houses had at least two bedrooms, a spacious living room, an indoor kitchen and a toilet depending on the race and status of the occupant. The houses were also equipped with power and water utility infrastructures. On the contrary, all African houses were in “uni-racial satellite towns, on the outskirts or some distance away” and were very small in design and size with

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<sup>79</sup> AbdouMalik Simone, “People as Infrastructure: Intersecting Fragments in Johannesburg” in *Public Culture* 16(3) (2004), 407–429; Sarah L. Smiley, “Heterogenous Water Provision in Dar es Salaam: The Role of Networked Infrastructures and Alternative Systems in Informal Areas” in *Environment and Planning E: Nature and Space* 3(4) (2020): 1215-1231.

<sup>80</sup> Stephen Halliday, *The Great Stink of London: Sir Joseph Bazalgette and the Victorian Metropolis* with Foreword by Adam Hart-Davis (Gloucestershire: The History Press, 2013), 21.

<sup>81</sup> Dieter Schott, “Urban Development and Environment” in *The Basic Environmental History* edited by Mauro Agnoletti and Simone N. Sernerri (Heidelberg: Springer, 2014), 171-198, here at 177.

<sup>82</sup> Richard E. Stren, *Urban Inequality and Housing Policy in Tanzania* (California: University of California, 1975), 35.

a single bedroom and a living room, but without a kitchen.<sup>83</sup> They had shared outdoor toilets and water taps or kiosks at one point in the whole street. Individual housing units were not connected to water or power networks, a typical outcome of splintering infrastructure.<sup>84</sup>

The physical boundaries and population growth transformed the city from a township into a municipality. The British colonial officials used population growth as a factor for improving the spatial organisation of urban areas. Spatial planning was institutionalised, especially after WWII, partly because of the absence of professional spatial planners during the interwar period.<sup>85</sup> However, the absence of professional planners was a British narrative, which was used to avoid doing equitable spatial planning in the hungry 1930s. Additionally, the British were unwilling to plan more areas after the township expansions of 1923-5 and 1932, years when spatial plans for Africans and Europeans were drawn for Kariakoo and Oyster Bay, respectively. Much of this transition is discussed in Chapter IV of this work. The municipality witnessed a change in urban governance: it now had a mayor, technocrats and appointed councillors for all the wards. In terms of racial composition, the African population was the biggest in the municipality. The population of Dar es Salaam rose from 22,732 in 1931 to 57,000 people in 1946.<sup>86</sup> The size of land was now approximately 60 km<sup>2</sup>. The city was cosmopolitan, with ideas, cultures, knowledge, economies, technologies and political practices from upcountry and abroad melting in it.

Between the 1930s and 1954, Dar es Salaam was the centre of quasi-nationalist political and welfare movements such as the African Association – a precursor of the post-colonial ruling party Tanganyika African National Union (TANU). Between 1954 and 1961, the headquarters of all the political parties that participated in the government through the ballot paper were in Dar es Salaam. This means that Dar es Salaam was important not only in unfolding the layers of colonial urbanism but also in the politics of colonialism and decolonisation. One of the political agendas articulated in the late colonial period and which gained popularity in the post-war era was housing. In the late 1920s, the British colonial government had built houses for its European officials, leaving Asian and African civil servants to fend for themselves. With much political agitation for equal provision of housing in the post-war era, the colonial government built a few housing units for all the workers under what could be interpreted as a tri-racial housing policy. The housing schemes in early post-colonial Dar es Salaam added new contours of housing units in what was

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<sup>83</sup> Frank Silvester White, “Some Problems of Town Planning for Multi-Racial Communities in Tropical East Africa” in *ICE Proceedings: Conference on Civil Engineering Problems Overseas* (London: ICE, 1958): 207-220, here 209-211.

<sup>84</sup> Sarah L. Smiley, “Heterogeneous.”

<sup>85</sup> See Notes on Eastern Province – Tanganyika by Lord Hailey and Mr. Cox in BNA CO 1018/69.

<sup>86</sup> Morogoro (Eastern Province) Vol. III: Dar es Salaam District Book, retrieved at Weston Bodleian Library, Ref. no. Micr. Afr. 472, Reel no. 07; Dar es Salaam Extra Provincial District Book V.I-II retrieved at Weston Bodleian Library, Ref. no. Micr. Afr., Reel no. 13; Notes on Eastern Province – Tanganyika by Lord Hailey and Mr. Cox in BNA CO 1018/69



Zone III during the British colonial era. In Magomeni, for instance, the houses built by the post-colonial state were qualitatively and quantitatively better than those built by the colonial state, as shown in the aerial photograph in Figure 2.3 below. Housing was a thorny issue to the African urbanites because most of them were not natives of Dar es Salaam. It became thornier in the post-war era because the Asians could reduce the house shortage in their zone through self-help schemes as they formed the merchant class with sufficient capital for building houses. This also explains why the Asians built storey buildings, while the Africans did not. This means that one could use the design and technological materialities of buildings to differentiate social layers in the population of Dar es Salaam during the British colonial period.

## 2.4 Post-colonial Dar es Salaam

Tanganyika attained independence from Britain in 9<sup>th</sup> December 1961. But it remained within the British Empire until December 1962 when it severed its imperial ties by becoming a republic under an executive president. Dar es Salaam continued to be the capital city of the young independent nation for over a decade and oversaw great participation of the locals in urban affairs. In the post-colonial local government system of Tanzania, the city was an urban enclave within Mzizima District in Coast Region. Other districts in Coast Region were Rufiji, Bagamoyo and Kisarawe. This setup showed a continuity of colonial administrative boundaries. For instance, in the 1940s, Dar es Salaam was an urban area within Uzaramo District, which was renamed Kisarawe and later Temeke District in the Eastern Province. Political boundaries were not the only colonial-post-colonial continuity. There was also a tendency to invest much in the urban affairs of Dar es Salaam at the expense of the rural areas within Mzizima District. Without a doubt, this continuity reverberated in the Central Committee of the ruling TANU and became a national issue, beyond the district and regional levels. As discussed in detail in Chapter V, the status of Dar es Salaam as the major consumer of development resources led to the dissolution of urban councils and the formation of the regional and district development councils instead. This was articulated in the famous political statement of the Party and the government, *Madaraka Mikoani*, a document which came out in May 1972 and which laid the principle of development by devolution.<sup>87</sup> The argument of devolution was that the national census statistics indicated that many people were in rural areas, and that urban Dar es Salaam took a lion share of development resources at the expense of rural areas. Consequently, the City Council of Dar es Salaam (DCC) became one of the many urban local government councils, which were dissolved following *Madaraka Mikoani*.

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<sup>87</sup> CZNA, PM/R50/20: Regional D.D. Quarterly Reports – Dar es Salaam.

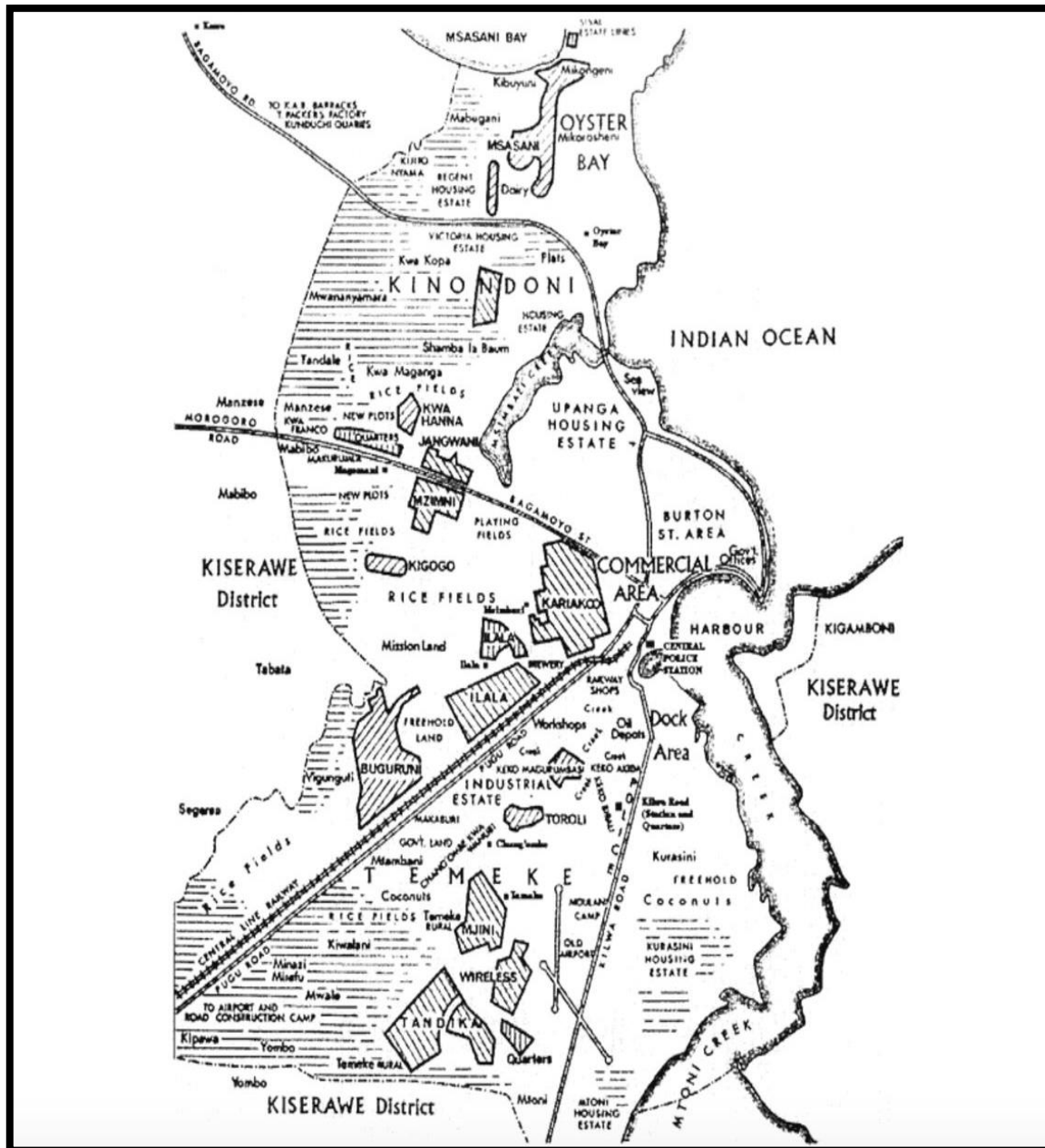


Figure 2.2: Dar es Salaam Boundaries and Housing Estates towards the End of British Colonial Rule  
 Source: J A K Leslie, *A Survey of Dar es Salaam* (1963, 1957).

The bolstering of rural development by denting urban development resources and focus was made clear on 14<sup>th</sup> March 1969 when President Nyerere changed ministerial names, organs and responsibilities. The changes were the fulfilment of a promise Nyerere had made in 1962.<sup>88</sup> Thus, the Ministry of Lands, Settlement and Water Development was renamed the Ministry for Lands,

<sup>88</sup> *President's Inaugural Address*, 10 Dec., 1962 in Julius K. Nyerere, *Freedom and Unity: A Selection from Writings and Speeches, 1952-65* (Dar es Salaam: Oxford University Press, 1966), 183. In that speech, Nyerere promised to put paramourcy on rural communities needs at the expense of the urban needs because out of the 10 million people of Tanganyika, the urbanites were less than 300,000 statistically. It was thus a logical decision.

Housing and Urban Development. The Village Settlement Division of the new ministry was transferred to the Ministry of Regional Administration and Rural Development.<sup>89</sup> To rub salt into the wound, TANU's Executive Committee affected further the development of Dar es Salaam following the decision to shift the capital from Dar es Salaam to Dodoma in central Tanzania which it made in 1972. The change was officially announced in 1973. The planning and construction programme for the new capital was to be implemented for a duration of 10 years.<sup>90</sup>



**Figure 2.3:** Colonial (Dark) and Post-colonial (Visibly Grid) Housing Estates in Magomeni - 1992  
*Source: Photographic Unit, Ministry of Lands, Housing and Urban Development, Tanzania.*

<sup>89</sup>*Africa Contemporary Record: Annual Survey and Documents, 1969-1970* (Exeter: Africa Research Limited, 1970), 190.

<sup>90</sup>*Africa Contemporary Record: Annual Survey and Documents, 1969-1970*(London: Rex Collings, 1974), 263-4.

In practice, however, the building and transfer of the capital from Dar es Salaam to Dodoma took more than four decades. It was not until 2016 when the government finally and fully moved to Dodoma. The politics of this capital change has been documented well in the treatises of the historians Reginald Kirey and Joseph Kulwa Kahama.<sup>91</sup> Shifting the capital had deeper consequences for the development of Dar es Salaam as the resources for transforming Dar es Salaam into a genuine national capital city were transferred to Dodoma. The desire and resources for developing Dar es Salaam into modern national capital were set in the *Dar es Salaam National Master Plan* of 1968 and *the Second Five-Year Development Plan* of 1969-74.

Albeit the backpedalling of the development of Dar es Salaam from above, there was a sigh of relief on 18 January 1974 when the city was declared an independent region, that is, it was no longer part of Coast Region. Dar es Salaam Region adopted the administrative boundaries of what was Mzizima District. Afterwards, the new region was divided into three districts: Kinondoni, Ilala and Temeke.<sup>92</sup> In 1982, parliament enacted a law to re-introduce local government in Tanzania, and that marked the official re-introduction of urban councils, including the DCC. The revival of urban councils occurred after it was realised that the dissolution of urban governance had caused the provision of infrastructure and services to become worse.<sup>93</sup> These minor — the turning of Dar es Salaam into a region and the revival of the city councils — positives could not undo the deeper consequences of the previous decisions and actions on urban development. Rather, they were further complicated by the economic crisis of the 1970s and 1980s. This bitter truth was reflected in the 1992 government decision to end the implementation of the 1979 Dar es Salaam Master Plan as well as in 1996 when the government dissolved again the DCC for its inability to deliver and manage infrastructure and social services in the city.<sup>94</sup> The DCC was replaced by the City Commission for a period of four years. In October 2000, the Dar es Salaam City Council was formed with three municipal governments of Kinondoni, Ilala and Temeke. It was the beginning of metropolitan governance in which most urban issues were addressed by municipalities, instead of the metropolitan City Council.

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<sup>91</sup> Reginald E. Kirey, “A Long Way to Dodoma: Deconstructing Colonial Legacy by Relocating the Capital City in Tanzania”, *Tanzania Zamani* 12 (1) (2020); Joseph Kulwa Kahama, *Sir George: A Thematic History of Tanzania Through His Fifty Years of Public Service* (Beijing: Foreign Languages Press, 2010), 73-90.

<sup>92</sup> *Africa Contemporary Record, 1973-1974*, 263; Letter from Regional Administrative Secretary, Dar es Salaam to Permanent Secretary, Prime Minister’s Office dated 04.06.1996 in CZNA, R76/125; “Dar City Now a Region” in *Tanzania News Review* No. 46 (Dar es Salaam: Ministry of Information and Tourism, 1974), 12.

<sup>93</sup> United Republic of Tanzania, *History of Local Government in Tanzania: The Decentralization Process*, CZNA, RALG/M.50/14; *Uhuru*, 4 April, 1981.

<sup>94</sup> Fredrick Sumaye, the Prime Minister of Tanzania government dissolved the Dar es Salaam City Council on 28<sup>th</sup> June, 1996. See *Daily News*, 29 June, 1996. On end of master planning approach see a letter Permanent Secretary for Ministry of Lands, Housing and Urban Development to Permanent Secretary for Ministry of Regional Administration and Local Government dated 05.03.2002 in CZNA, RALG/M.50/14.

The transition from colonial to post-colonial urban governance revealed the ups and downs of urban governance, as shown above. But there were some continuities and changes. One of the notable continuities was the outward expansion of the city boundaries that maintained the colonial binary of rural and urban Dar es Salaam. The link between the two areas was in the pragmatic question of producing food resources such as eggs, vegetables and milk. The rural areas were reserved for producing food for the urban population; thus, they helped to realise the vision to have a self-sustaining city. The divergence occurred when it came to matters of transport, drainage, waste removal and other kinds of critical infrastructure. The rural areas usually received little attention with respect to infrastructural services, unless the urban boundary was extended into certain parts of the rural areas.

In post-colonial Dar es Salaam, the considerations and debates on the formal boundary expansion began in 1965 and continued until the 1980s. The argument put forth for expanding the city was the intention to include the newly established, unplanned residential and industrial areas into the infrastructure regime and development control of the DCC, especially the heavily built-up areas along the main roads. In 1965, for instance, local government officials wanted to control unplanned urban building, “while administrative control over the area would remain with Mzizima District Council.”<sup>95</sup> Despite that attempt, the city continued to grow without the government’s control as people were addressing the housing problem under self-help initiatives. By 1999, most of the areas which had been rural during the implementation of the two master plans of post-colonial Dar es Salaam had become urbanised but still unplanned, with most of them receiving roads and power infrastructural services under the self-help schemes. Because of colonial-postcolonial nature of urban growth, the city area which looked like bird’s head and beak during the German era, and birds head with semi-open wings in the British era; assumed the shape of a fully flying bird after the 1990s.

Some of the colonial urban social controls continued in post-colonial Tanzania. Dar es Salaam was the centre in which their existence was manifested and contested heavily owing to its political and economic influence on the whole country. The dress code, city migration and social vices like prostitution were the main issues discussed by the general public, the party and the government. The dress-code talk began gradually in the media and the public in the 1960s.<sup>96</sup> In early 1973, the matter was tabled and discussed by the TANU National Executive Committee. The latter directed the TANU Youth League and the People’s Militia to ensure that everybody dressed

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<sup>95</sup> Memo from Director of Local Government (Urban) to Principal Secretary (Rural Administration) dated 27.8.1965 in CZNA, LG. 81510: Dar es Salaam City Council Boundaries and Layout.

<sup>96</sup> For instance, *The Standard* of 24.10.1968 had the heading “Debate on the Mini Ban Nearly Over” in which it reported the incidents against those who wore miniskirts, and the heated debate in public and in ruling party.

decently, instead of wearing “tight trousers, boogaloes and mini-skirts.” Attempts were also made by the Prime Minister to enact “a Bill setting out a dress code for the nation” but in vain. Later, the government learnt that enforcement of the decent dress was becoming problematic and controversial; creating a rift between the youth and the elders on one hand, and between the people and the government on the other. Speaking to the TANU elders in November 1973, the president put the matter to rest, saying that “youthful fashion trends from generation to generation” are a normal thing that should be tolerated.<sup>97</sup>

Unemployed men and women in Dar es Salaam were also targeted by the state in the first two decades after independence. They were seen as migrants who had run away from the rural areas. In the late 1960s and 1970s, any unemployed person and petty traders could be caught by the police in the city and taken to Ujamaa villages on the outskirts of Dar es Salaam, unless they were married to employed individuals.<sup>98</sup> Ujamaa villages like Gezaulole and Kwembe became the abode of such undesired people. Furthermore, women who were accused of practising prostitution were caught by the police and transported back to their native homes under police escort. Most of the female prostitutes were reported to have originated from Kagera Region in north-western Tanzania. In July 1968, for instance, the *Baraza* newspaper reported on 65 women being sent back to Kagera via Nairobi and Dodoma.<sup>99</sup> The social controls in the colonial period were backed with pieces of legislation like the *Townships (Removal of Undesirable Natives) Ordinance*. Such controls have been interpreted by some historians as emanating from anxiety in urbanisation amid failure to provide equitable and adequate urban infrastructure, unemployment and underemployment.<sup>100</sup> This interpretation is supported by colonial records. For instance, in 1947, between 500 and 600 people were removed from Dar es Salaam on a monthly basis in order to reduce the impact of the housing crisis.<sup>101</sup> Working for the Colonial Office in London, Lord Hailey argued that the removal of unemployed Africans from the city would be ineffective unless the Tanganyika government “restrict[ed] entry or residence by permit or pass system.”<sup>102</sup> In the post-colonial era, the laws curbing the number of the ‘undesirables’ were repealed. The Ujamaa policy, which emphasised rural development and stated that urban areas were places for workers only, offered a moral justification for removing the ‘undesirables’ from the city. Control of the undesirables exceeded in

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<sup>97</sup> All quotes taken from *Africa Contemporary Record 1973-1974*, 271.

<sup>98</sup> *Africa Contemporary Record: Annual Survey and Documents 1977-1978* (New York and London: African Publishing Company, 1979), B406.

<sup>99</sup> *Baraza*, 11 July, 1968.

<sup>100</sup> For articulate account on the colonial period removals see Andrew Burton, *African Underclass: Urbanisation, Crime & Colonial Order in Dar es Salaam* (Oxford: James Currey, 2005).

<sup>101</sup> Notes on Eastern Province – Tanganyika by Lord Hailey and Mr. Cox in BNA CO 1018/69.

<sup>102</sup> Hailey, *Native Administration in the British African Territories*, 339.

the 1980s, especially after the enactment of the *Human Deployment Act* of 1983, which sought to increase labour efficiency and discipline. Some people argued against the enforcement of the law as it led to the imposition of a *de facto* curfew in Dar es Salaam as people were not allowed to be in the streets between 10pm and 6am. They argued that the law brought military order as if the country was in terror fight or was not free yet.<sup>103</sup>

Another critical issue which was a product of the segregationist colonial policies and the ever-rising population was housing. The colonial state had attempted to build a few houses towards the end of the colonial period. The houses were small, since they were built under the assumption that Africans were transient urbanites with native homes outside Dar es Salaam, and that they returned there regularly. Size was not the only problem: the houses were also few. The outcome was that very few Africans could pay the high house rents. TANU capitalised on the people's grievances about the high rents and house shortages at its political rallies. Channelling the grievances to political actors was one of Africans' responses to the problems. They also decided to build their own houses, which were poorly built. It was noted that the building of such houses was an attempt "to peg rents by putting up temporary houses."<sup>104</sup>

The post-colonial state addressed the housing crisis in five ways. First, the state encouraged the establishment self-help schemes through which people were allowed to build their own houses, but by following certain standards in terms of the design and building materials.<sup>105</sup> A few, however, adhered to the standards because most of them built on lands which had not been surveyed and did not apply for building permits. This led to the making of urban informality. Some of the unplanned settlements like Buguruni were demolished by the state in the 1970s.<sup>106</sup> There was a change in the 1970s and 1980s as the state surveyed more land to ensure that the self-help schemes were ordered. Secondly, the state founded the National Housing Corporation (NHC) in 1962. NHC was a real estate corporation entrusted with building houses, leasing houses and providing infrastructural services in its estates. More houses were built in Dar es Salaam than in any other urban area in Tanzania between 1962 and 2000. All the houses, except for the few built by the British (see Figure 2.3) were built by NHC.

The third measure was encouraging firms and manufacturing companies, public as well as private, to build houses for their workers. Literally, all state-owned firms built flats for their employees within their industrial areas. Fourthly, the state nationalised the housing units and estates

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<sup>103</sup> *Africa Contemporary Record: Annual Survey and Documents 1983-1984* (New York and London: Africana Publishing Company, 1985), B276-7.

<sup>104</sup> Notes on Eastern Province – Tanganyika by Lord Hailey and Mr. Cox in BNA CO 1018/69

<sup>105</sup> *Tanganyika Standard*, 7 June, 1962; Julius K. Nyerere, *The Arusha Declaration: Ten Years After* (Dar es Salaam: the Government Printer, 1978)

<sup>106</sup> *Sunday News*, 20 September, 1981.

which used to belong to individuals — merchants and owners of firms, most of whom were Asians and Europeans — at the city centre, Upanga and Oyster Bay. The nationalisation of houses was part of the broader nationalisation drive between 1968 and 1971, after Tanzania had become a socialist state. The nationalisation of houses was aimed at, among other things, accumulating capital for the state, which was in dire need of funds for implementing its vast development projects.<sup>107</sup> Finally, though temporarily, the state intervened in setting rent rates through laws which sought to curb the rise in house rents in urban areas, the main target being Dar es Salaam. To this end, the state maintained the *Rent Control Ordinance*, a colonial legal tool whose antecedents was in 1939. The debates and laws over rent rates were common between 1961 and 1971.<sup>108</sup> In their totality, the measures taken increased the availability of houses, improved the condition of houses and significantly reduced the pace of informality in house construction for at least two decades. With the deep economic crisis in the 1980s, informality started growing fast because the capacity of NHC and the City Council to build houses had been reduced and there was a shortage of building materials. The shortage of building materials has been aptly documented in Emily Brownell's recent publication, *Gone to Ground*, and in the government's annual economic status reports for the 1970s and 1980s.

The construction of flats at Urafiki Textile Factory in Ubungo, and NHC's Buguruni and Tandika estates were the only attempts by the state to build high non-business buildings. The housing policy was implicitly geared towards providing housing units for workers—the people who worked in factories or in the civil service. The rural dwellers of Dar es Salaam and other areas in post-colonial Tanzania were not provided with housing, despite the fact that the national development policy was pro-rural development at the expense of urban development. Definitely, the rural development policy was backed by census reports which indicated that Tanzania's rural population stood at 93.6% in 1961 and at 76.9% in 2002.<sup>109</sup> The statistics indicate that, by 2002, one in every four Tanzanians was living in an urban area. In the same year, Dar es Salaam had about 94% of its population already urbanised. By 2012, the census reports indicated that all Dar es Salaam residents were urbanised whose numbers had reached 4,364,541 —equivalent to 10% of the total count of Tanzania's population. Over 90% of the houses in post-colonial Dar es Salaam were built horizontally — single storey houses — thus more land was used for housing than for

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<sup>107</sup> Kjell Havnevik, "A Historical Framework for Analysing Current Tanzanian Transitions: The Post-Independence Model, Nyerere's Ideas and Some Interpretations" in *From Nyerere to Mkapa: Tanzania in Transition* edited by K. Havnevik and A.C. Isinika (Dar es Salaam: Mkuki na Nyota, 2010), 36-7.

<sup>108</sup> *Sunday News*, 20 May, 1962.

<sup>109</sup> United Republic of Tanzania, *2002 Population and Housing Census: Analytical Report* Vol. X (Dar es Salaam: National Bureau of Statistics, 2006), 9.



gardening, forestry, industries, agriculture, recreation and infrastructure. Consequently, the city expanded horizontally fast towards the previously rural areas.<sup>110</sup> In 2002, Lupala argued that the horizontal buildings were making the city to be defined as a low-density area, despite the fact that it had certain implications for the provision of transport infrastructure on the part of the state and the city authorities. He also noted that it was one of the reasons the urbanites spent much time en route to work and business places. Finally, Lupala — now the Director of Urban and Rural Planning at the Ministry of Lands, Housing and Urban Development — concluded that the design caused most of the urbanites incur huge costs as they spend much time en route to work and business places.<sup>111</sup> The expansion of the city followed the main highways that strew from the CBD outwards like a shape of the hand with widespread fingers. The expansion was uncontrolled and its pace was higher beginning in the late 1980s when the implementation of the city master plan came to a halt.

Uncontrolled expansion of the city and the urban sprawl in the pos-colonial era are regarded by the government and researchers as being a product of rapid population growth. On the contrary, rapid population growth is said to be emanating from the migration of upcountry people to Dar es Salaam. Those who migrate to the city run away from poverty in the rural areas and go to the city to search for greener pastures. Such studies fail to acknowledge the role of natural population growth in rapid population growth. For a long time, Dar es Salaam has had the best social services that enable people to have a higher life expectancy. The best social services are a double-edged sword as they are a pull factor in rural-urban migration and a factor for population natural growth, for they reduce life risks. One of the reasons for arguing in favour of natural population growth is that Dar es Salaam lacks slums and shanties such as those found in Johannesburg, Nairobi, New Delhi and Jakarta. Slums and shanties are a characteristic of not only poverty and social marginalisation in urban areas but also of rapid rural-urban migration. On the contrary, the city has had informal settlements with modest housing units. Most of the houses also offer room rentals. A study is yet to be done to obtain data on the households that rent houses or rooms. But there is data on the number of households in Dar es Salaam which indicates that, by 2012, the city had around 1,083, 381 households.<sup>112</sup>

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<sup>110</sup> Cf. John Modestus Lupala, “Urban Types in Rapidly Urbanising Cities: Analysis of Formal and Informal Settlements in Dar es Salaam, Tanzania” (Royal Institute of Technology, PhD Thesis, 2002), 5.

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

<sup>112</sup> URT, *Tanzania Mainland – Basic Demographic and Socio-Economic Profile: 2012 Population and Housing Census*. Vol. IIIB (Dar es Salaam: The National Bureau of Statistics, 2014).

## 2.6 Conclusion

The city expanded rapidly in the post-colonial era. To an urban planner like Othmar Mng'ong'o, the city developed into two main parts, the inner part and the outside part.<sup>113</sup> The inner part is the area that has faced superposition of colonial and post-colonial spatial planning, an area that captures all the processes of urbanisation in Dar es Salaam. It is the area that is not only politically powerful but also socially and economically so. Socially, it is the part of the city which has served as the melting point of ethnic cultures, the centre cosmopolitanism in all facets of life.

In this study, the city is presented as an area that is historically the most planned area, yet it is an area that is most vulnerable to persistent flooding during flash or seasonal rains. This background builds a case for undertaking a project to explain flooding through the prism of drainage and traffic infrastructure, the most critical urban technologies in all spatial plans of the city. The outer city is the area that has for a long time been rural. Until 2000, the area was least served by the city administration in terms of the provision of infrastructure, was less important politically, socially and economically and experienced a few activities relating to spatial planning. Most of the buildings in the area have been built without planning or formal authorisation. This made the outer city to be the main centre of informality in Dar es Salaam. In the colonial era, it was inhabited by the Zaramo, the natives of Dar es Salaam. Over time, other ethnic groups have infiltrated the area, thus making the Zaramo move further on to the outskirts of the city and the neighbouring Coast Region. Scholars who assume that the fastest growing cities frequently see the rise of urban slums may not find evidence of that in Dar es Salaam, since many informal settlements in the city have decent housing units built under the self-help schemes but without following any planning standards. The outer city embodies the rapid population growth in Dar es Salaam, explains the heavy traffic congestions towards the outskirts of the city as well as the limited reach of city governance. It is a site of post-colonial urban development and future re-development. Perhaps, the outer city is not an ideal place for studying the provision of infrastructure using Western analytical frameworks and urban theories such as splintering urbanism and networked city because the outer city has developed from below.

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<sup>113</sup> Othmar S. Mng'ong'o, "A Browning Process: The Case of Dar es Salaam City" (PhD Diss., Royal Institute of Technology, 2004).

# CHAPTER III

## BUILDING A SPLINTERED CITY: SPATIAL AND INFRASTRUCTURAL CONFIGURATIONS IN DAR ES SALAAM, 1891 to 1945

In 1917, the historian Albert F Calvert wrote that:

The Germans have transformed the dirty negro villages of Dar es Salaam and Tanga into a substantial and imposing town, they opened up trade routes and established markets in every direction.... In the building of towns, railways, roads, barracks, post, and telegraph stations, the Germans have done admirable work...<sup>1</sup>

Calvert was one of the earliest British historians who tried to describe German East Africa at a time when the territorial defence lines were falling to the allied forces during the First World War (WWI). Although he used racial tinges in describing the indigenous people, Calvert referred specifically to the work the Germans had done in Dar es Salaam and Tanga. In so doing, he was representing the modernist ideal that was common among the European technocrats, publicists, intellectuals and colonial agents over the African continent. If we disregard the value-laden portrayal of Dar es Salaam and its people, we find that the message here is that the town was initially a village with no large technical systems like those found in the Global North cities. The other message is that Dar es Salaam underwent rapid infrastructural and spatial transformations at the onset of colonialism. The legacy of the infrastructural and spatial transformations is still present in the city.

This chapter attempts to reconstruct the infrastructural and spatial changes that occurred in Dar es Salaam roughly from 1891 to 1945. It seeks to identify the key institutions and their role in shaping the urbanisation processes, the infrastructure ideals that shaped the installation and distribution of urban systems, and the people or organisations that funded all the infrastructural activities. The chapter also examines two key kinds of infrastructure that are discussed throughout this thesis, namely drainage and traffic infrastructure. It concludes by arguing that the period examined in this chapter provides material for discussing the earliest forms of technological circulation and appropriation in the Global South. Particularly, the drainage and traffic infrastructural circulation in Dar es Salaam was influenced by the colonial power relations that culminated in the creation of a splintered spatial and infrastructural configuration.

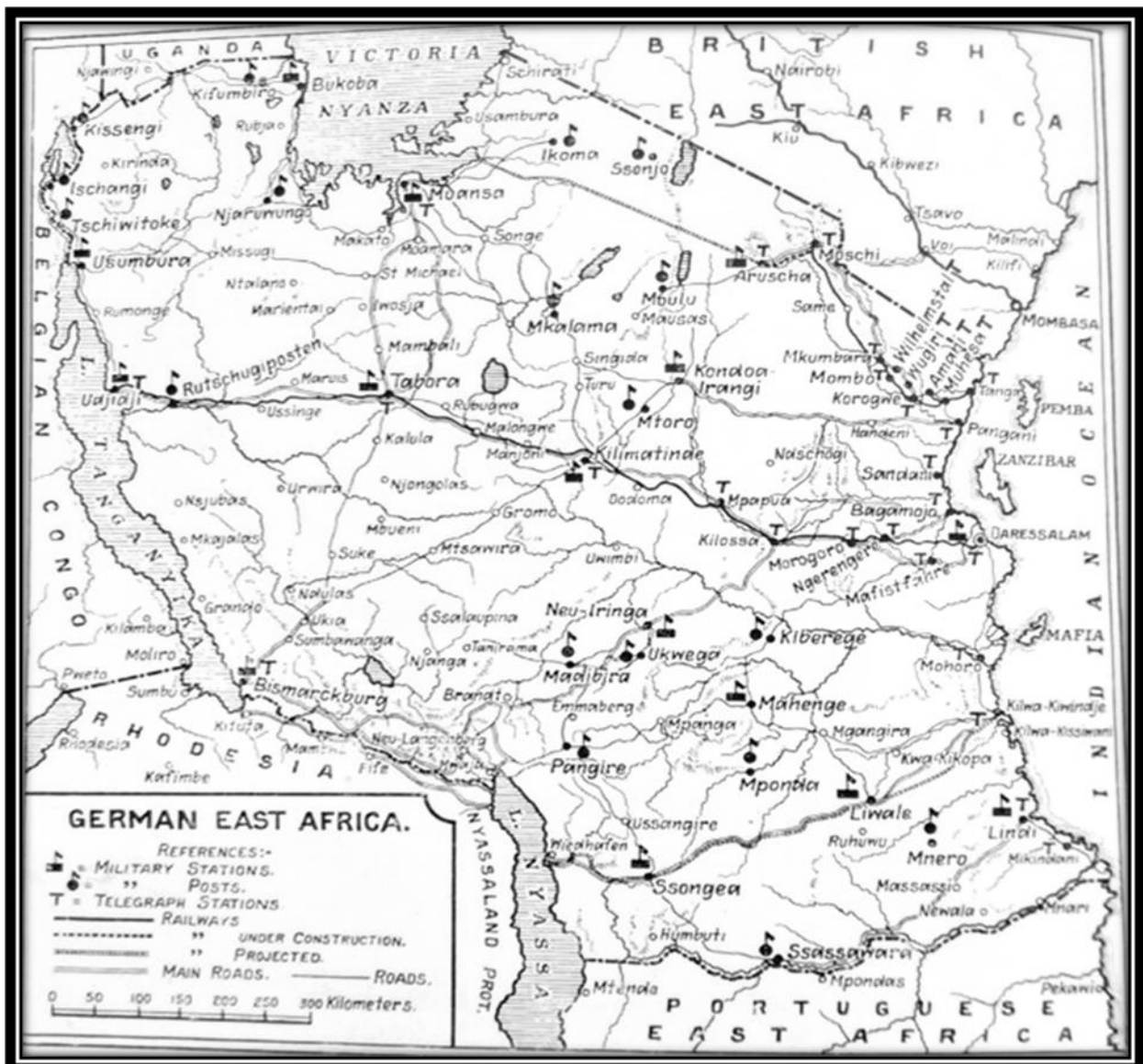
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<sup>1</sup> Albert F. Calvert, *German East Africa* (London: T. Werner Laurie Ltd., 1917), xviii.

### 3.1 Institutional Structures in Dar es Salaam

#### 3.1.1 German Infrastructure Regimes

As shown in the preceding chapter, Dar es Salaam was the political capital of both the colonial and post-colonial states. The city had both commercial and economic magnates in the sense that most of the commercial activities and infrastructural services were concentrated in and radiated from the city to the rest of the territory. Below is a map of showing some of the roads, railways and telegraph networks constructed by the Germans to link the territory with Dar es Salaam.



**Figure 3.1** Railways, Roads and Telegraph in German East Africa  
*Source: Albert F Calvert, German East Africa (London, 1917).*

When Calvert referred to the building of the trade routes and markets, he meant the routes that followed the infrastructural networks built by the Germans. It should not be thought that there were no commercial activities and routes in Dar es Salaam before the advent of colonialism.

Commercial and trade routes existed in the city long before colonialism. The distinction lies in the fact that the older routes were not for wheeled technologies like railways, motor vehicles and rickshaws in terms of design. They were structured to suit the portering activities between the coast and inland commercial centres. Accounts of the European missionaries and explorers' activities in 19<sup>th</sup> century Africa show that portering was the main form of transport.<sup>2</sup> Portering was key even during the early colonial decades, in some places up to the 1950s. It was the main form of inland transport during the German colonial period. The reliance on portering continued to the WWI in German East Africa to the extent that a historian Michael Pesek dubbed the war “the war of legs.”<sup>3</sup> Portering was dependent on African labour that carried loads of commercial goods from one centre to another. In the pre-colonial days, Dar es Salaam was not the main coastal commercial centre. As such, its trade routes and markets were too small as to be an impediment to the development of vibrant urbanism.



**Figure 3.2** Portering: Porters on the March  
*Source: Albert F Calvert, German East Africa (London, 1917).*

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<sup>2</sup> See Martin Dugard, *Into Africa: The Dramatic Retelling of the Stanley-Livingstone Story* (London: Bantam Books, 2004)

<sup>3</sup> Michael Pesek, “The War of Legs: Transport and Infrastructure in the East African Campaign of World War I,” *Transfers* 5, no. 2 (2015), 102-120.

Being a native Zaramo area, pre-colonial Dar es Salaam was under the political control of Zaramo chiefs. The chiefs had submitted themselves to the control of the Sultan of Zanzibar in about the 1860s.<sup>4</sup> They controlled the inland trade routes, whereas the main port was under the control of the Sultan. This is to say that most of the traditional technical infrastructure found in Dar es Salaam before it was transformed into a city were under native control and a few under the Sultan. With respect to the advent of European colonialism, historians James Brennan and Andrew Burton have poignantly asserted that the Sultan of Zanzibar was building the palace and a port at what is the city centre today. The palace and the port were in semi-finished condition by the 1880s following the death of Sultan Bargash in 1869. With the exception of the few unfinished but significant structures, the rest of city was covered by either “coconut plantations” or native “Zaramo and Shomvi villages.”<sup>5</sup> There is no mention of roads or other modern large technical systems in Brennan and Burton’s work.

The modern infrastructure built at the beginning of colonialism were managed and owned by the colonial state. Such infrastructure came as a package of the ‘civilising mission’, a narrative that was used by all colonial powers in justifying conquest.<sup>6</sup> The civilising mission was a broader movement with many facets. It involved introducing new forms of government structures, legal systems, Christianity, medical systems, spatial planning and infrastructural engineering. The historian Casper Andersen, who examined the place of British engineers in the colonial empire, argues that the engineers considered their functions as an extremely powerful tool for civilising the continent and its people. To them, engineering projects such as the construction of railways, roads, dams and houses were more transformative in backward environments and a formidable weapon for winning the hearts of Africans than was the idealistic Christianity.<sup>7</sup> They wanted more funds and efforts be directed in building large technical systems than to any other civilising activity.

A survey of African history reveals that the period between the 1880s and 1940 was a formative phase in the history of the colonial infrastructure building. It is a period in which the large, modern, technical systems spread to the colonies. The building would first begin in the

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<sup>4</sup> James R. Brennan and Andrew Burton, “Introduction,” in *Dar es Salaam: Histories from an emerging Metropolis*, ed. James R. Brennan, Andrew Burton and Yusuf Lawi (Dar es Salaam: Mkuki na Nyota, 2007), 3.

<sup>5</sup> *Idem*, “The Emerging Metropolis: A History of Dar es Salaam, circa 1862-2000”, 17-23; See also James R. Brennan, *Taija: Making of Nation and Race in Urban Tanzania* (Athens: Ohion University Press, 2012), 15.

<sup>6</sup> G.N. Uzoigwe, “African Partition and Conquest: An Overview,” in *General History of Africa: Africa under Colonial Domination 1880-1935*. Vol. VII, ed. A. Adu Boahen (California: Heinemann, 1985), 19-44; for succinct and recent elaboration of this ideology see Lawrence E.Y. Mbogoni, *Aspects of Colonial Tanzania History* (Dar es Salaam: Mkuki na Nyota, 2013).

<sup>7</sup> Casper Andersen, *British Engineers and Africa, 1875-1914* (London: Pickering and Chatto, 2011), 12-14; In Bruce Sinclair, “Local History and National Culture: Notions on Engineering Professionalism in America”, *Technology and Culture* 27, no. 4 (1986), 683-693, here 686, engineers did not feel they were recognised fairly enough in the making of modern America that they organised celebrations to “publicize the claim that engineering was the basis of modern civilization”. This means, engineers felt underrated not only in the imperial projects but also in the Global North technological achievements.

colonial capitals and then radiate towards the economically potential regions. Large parts of the colonial territories were left untouched, partly because they had less economic potential and because of the economic organisation of the colonial states. A renowned African historian and political scientist, Samir Amin, put the inter-territorial and intra-territorial colonial economies into three categories. The first was the Africa that served as a labour reserve. In that part of Africa, there was no development so that it could provide labourers for the highly productive areas. The second category was the Africa with concession companies and settler economies. In such areas, the colonial powers and companies invested heavily in infrastructural development because there were many Europeans and high economic potentiality in the areas. The third and last category was the Africa of peasant economies. These were the areas which were economically very potential but, owing to a host of factors, including African resistance and tropical diseases, the European population was limited in such areas. Hence, Africans were transformed into commercial peasants and infrastructure was built in most populous centres for the purpose of exporting wealth.<sup>8</sup> From this categorisation of Africa, one could argue that infrastructural development in the formative phase of colonialism was mainly rural.

It is on the basis of this socio-economic background that distribution of infrastructure in colonial Africa can best be discerned. In German East Africa, Dar es Salaam and Tanga were inevitably the colonial cities. By 'colonial cities' I mean that they were a colonial construct, cities and towns which were founded by colonizers. Before the colonial conquest, the two cities were rural areas, mere native villages, with less than 5,000 people in each.<sup>9</sup> It was the Germans who developed urban plans for only the two cities in an area of less than 20 sq. kilometres for each out of more than 900,000 sq. kilometres of the whole German East African territory. The two cities underwent a rapid transformation in political, spatial and technological dimensions. A prominent historian of African urbanization, Bill Freund, argues that such colonial cities across Africa were designed purposely to meet the colonial interests. Colonial cities became a common feature in such settler colonies as Southern and Northern Rhodesia (now Zimbabwe and Zambia), Kenya, Algeria, Morocco and Tunisia.<sup>10</sup>

In the colonial worlds, the colonial agents and governments appropriated land from the local people in several ways. In Dar es Salaam, force and purchase were used simultaneously. From

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<sup>8</sup> Samir Amin, "Underdevelopment and Dependence in Black Africa: Origins and Contemporary Forms," *The Journal of Modern African Studies* 10, no. 4 (1972): 503-524.

<sup>9</sup> In a PhD dissertation, "Nation, Race and Urbanization in Dar es Salaam, Tanzania, 1916-1976," by James R. Brennan submitted at Northwestern University, 2002; for population figures indicating urbanization of Dar es Salaam see Dar es Salaam District Book, Micr. Afri. 472: Reel no.07 and 13 at Oxford Bodleian Library.

<sup>10</sup> Bill Freund, *The African City: A History* (Cambridge: Cambridge University Press, 2007), 77-82.

1885 to 1891, the *Deutsch-Ostafrikanischen-Gesellschaft* (DOAG) used ‘gunboat diplomacy’ to obtain indirect control of the Sultan’s subjects and their land. In 1887, the chief agents of DOAG purchased the part of the land north of the port from the native Zaramo people at gun point.<sup>11</sup> This means that compulsion preceded sale agreements. It also sheds light on the nature of the founding of German colonial cities in East Africa. It could also be argued that the Germans wanted to attain legal legitimacy on the land unto which the city was founded. They could have alienated the land if the company had an army and weapons. Land alienation was forceful appropriation of land without giving any form of compensation to the owners. In some places in colonial Africa, land alienation involved violence and total eviction of land owners. In 1890, a year before the formal transfer of the colonial territory from company rule to state rule, the German government purchased the coastal strip of German East Africa from the Sultan of Zanzibar for about £200,000.<sup>12</sup> The purchased coastal strip was 16 miles wide from the shoreline of the Indian Ocean to the hinterland, and about 600 miles long from the border with Kenya in the north to the border with Portuguese East Africa in the south. In the two purchases, Dar es Salaam was part of the ‘land’ purchased. Hence, the city was not only conquered, but also purchased and transformed in new ways under the new owners.

The literature on the history of Dar es Salaam has paid attention to land acquisitions during the German era. They include Brennan, Burton and Lawi’s *Dar es Salaam: Histories from an Emerging Metropolis*; Kironde’s “The Evolution of the Land Use Structure of Dar es Salaam 1890-1990: A Study in the Effects of Land Policy”; and Calas’ *From Dar es Salaam to Bongoland: Urban Mutations in Tanzania*. What these works have in common is that they all indicate that the Germans institutionalised the capitalist property relations over land issues in Dar es Salaam.<sup>13</sup> They commoditised land through contracts and title deeds. In this work, it is argued that the purchase approach contrasted sharply the German urban development from other European colonial cities in Africa. Put otherwise, the Germans put morality at the front by seeking property legitimacy through purchases. Archival records also show the Germans’ reluctance to alienate land in Dar es Salaam. This has been uncovered in a social survey of the natives done on the outskirts of the city in May 1939 by H H McCleery. McCleery found that the Germans only bought necessary land – land on which to build critical public structures like infrastructure and office buildings – leaving

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<sup>11</sup> Jürgen Becher, *Dar es Salaam, Tanga und Tabora: Stadtentwicklung in Tansania unter deutscher Kolonialherrschaft* (Stuttgart: Franz Steiner, 1997); Brennan and Burton, “Emerging Metropolis”, 19, 21.

<sup>12</sup> P.H.C. Clarke, *A Short History of Tanganyika: A Mainland of Tanzania* (Arusha: Longmans, 1966).

<sup>13</sup> Cf. Andreas Eckert, *Grundbesitz, Landkonflikte und kolonialer Wandel* cited in Franck Raimbault, “The Evolution of Dar es Salaam’s Peri-Urban Space During the Period of German Colonisation (1890-1914)”, 25-98.



the rest to the natives.<sup>14</sup> Paul Wenzel Geissler and others have recently found that the land on which the Amani Research Centre seats was also purchased by the Germans from the locals for 12 rupees.<sup>15</sup> In the period between 1906 and 1914, the rationale for not appropriating land by force was the prevention of any possible African rebellion.<sup>16</sup> Land perchance is the reason that, in 1919, some Africans in Dar es Salaam made comparisons and concluded that “[t]he Germans have bitter words but are kind-hearted: the British have sweet words but are heartless.”<sup>17</sup> A comparison with other colonial cities reveals that land had to be appropriated from Africans so that the settlers and state could get land in ways comparable to those of the mercantile phase of capitalism. That was primitive accumulation of capital. It had no moral justification. In the French, Portuguese and British colonial cities, force was utilised to grab Africans’ land to found towns. The founding of Nairobi and Salisbury (now Harare) in British Kenya and Southern Rhodesia is a case in point.

The land purchases at individual level did not cover every land in Dar es Salaam and in the rest of German East Africa. It would have been unsustainable given the high demand for land for providing infrastructure and services, and the size of the territory. Furthermore, like Dar es Salaam, the territory was underpopulated. It follows that the 1895 land decree made by the Germans was in essence responding to the limitations of the purchase approach as well as taking advantage of the territorial state of under-population.<sup>18</sup> The land decree nationalised all lands in German East Africa. The colonial state became the sole owner of all the land in the territory. The state gained the power to appropriate land for public use when the need to do so arose. A French historian, Franck Rimbault, has discovered that, between 1903 and 1909, the German colonial state resettled the Nyamwezi and Sukuma farmers on the outskirts of Dar es Salaam so that they could produce food for the capital.<sup>19</sup> If truth be told, all the world cities have their own metabolism in which resources like the food that is produced elsewhere feed them, before ejecting waste in many other forms.<sup>20</sup> The Nyamwezi and Sukuma originally lived, and still do, in the south of Lake Victoria in

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<sup>14</sup> Bodleian Library (formerly Rhodes House Collection, Micr.Afr.472 – Reel No. 13: Dar es Salaam Extra-Provincial District Book V.I-II

<sup>15</sup> P. Wenzel Geissler et al., “Amani” in *Traces of the Future: An Archaeology of Medical Sciences in Africa* edited Paul Wenzel Geissler et al. (Bristol: Intellect, 2016), 107.

<sup>16</sup> John Iliffe, *Tanganyika under German Rule, 1905-1912* (Cambridge: Cambridge University Press, 1969), 125-128.

<sup>17</sup> My translation from Heinrich Schnee, *Deutsche-Ostafrika im Weltkrieg* (Leipzig: Quelle & Meyer, 1919), 435. Schnee was the last governor of German East Africa having been preceded by von Wissmann, von Soden, von Schele, von Liebert, von Götzen and von Rechenberg.

<sup>18</sup> J.M. Lussuga Kironde, “The Evolution of the Land Use Structure of Dar es Salaam 1890-1990: A Study in the Effects of Land Policy” (PhD. Thes., University of Nairobi, 1994), 25.

<sup>19</sup> Franck Rimbault, “The Evolution of Dar es Salaam’s Peri-Urban Space During the Period of German Colonisation (1890-1914)” in *From Dar es Salaam to Bongoland: Urban Mutations in Tanzania*, ed. Bernard Calas (Dar es Salaam: Mkuki na Nyota, 2007), 56.

<sup>20</sup> Dieter Schott, “Urban Development and Environment” in *The Basic Environmental History* edited by Mauro Agnoletti and Simone N. Sernerri (Heidelberg: Springer, 2014), 171-198.

the north of modern-day Tanzania. Just as during the German colonial days, they are revered for being industrious people, especially in agricultural production. It is no wonder that the Germans appropriated the land around the city and gave it to the Sukuma people so that they could cultivate food crops.

The completion of land purchases in 1890 from individuals and the Sultan of Zanzibar was followed by the transition from company rule to state colonial rule. The selection of Dar es Salaam as the capital (*die Hauptstadt*) of German East Africa should be credited to the second Governor, Julius von Soden. Von Soden capitalized on the decision of his predecessor, Hermann von Wissmann, who had turned Dar es Salaam into a military station as early as 1889 and into a district in January 1891.<sup>21</sup> The decision was not reached smoothly as there were contestations among the Germans. As the first Governor, von Wissmann is reported to have preferred Bagamoyo as the capital because of its strategic importance in commerce and in its geographical link to other parts of the territory. To him, Bagamoyo was at the centre of the territory.<sup>22</sup> Dar es Salaam would thus remain a mere military station. Those who preferred Dar es Salaam over Bagamoyo were concerned about the shallow port waters of Bagamoyo. Dar es Salaam had a natural deep but narrow harbour. It was this advantage that made Dar es Salaam an “exceptional” site for the big ships coming to the capital.<sup>23</sup> While historians refer to this comparative advantage, I want to believe that the Germans were also concerned about the security and low population concentration of Dar es Salaam. That is, it was easy to chart a new urban setting in German designs without inflicting damage to the locals, a damage that would have bred resistance. This observation is based on the fact that Dar es Salaam was less populated than Bagamoyo as the latter town had been the centre of Eastern and Central African caravan trade for centuries. Bagamoyo had more permanent structures, merchants and slaves than Dar es Salaam. It was already an established urban setting. The observation is also based on the fact that the urban master plans have been more successful in underpopulated areas.<sup>24</sup> The argument gains more weight if we also consider the fact that there was no single demolition that happened in German Dar es Salaam. Demolitions began attaining popularity in British and post-colonial Dar es Salaam. In addition, the historian Philip D Curtin believes that those who chose Dar es Salaam as the capital of the territory were appropriating American architectural values of building houses in elevated or hilly landscapes. Unlike Bagamoyo, Dar es Salaam offered a relatively elevated “site with a breeze and a view”, which symbolically

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<sup>21</sup> Brennan and Burton, “Emerging Metropolis”, 21.

<sup>22</sup> Raimbault, “Evolution of Dar es Salaam’s”, 31.

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

<sup>24</sup> Cf. David Nye, *America as Second Creation: Technology and Narratives of New Beginnings* (Cambridge: The MIT Press, 2003).

showed the Germans' "power and wealth".<sup>25</sup> This implies that idiosyncratic and socio-economic factors were also at play at the time of choosing a site for building the capital of German East Africa.

Being a district meant that Dar es Salaam had its own district commissioner, who represented a new political regime. It also meant the end of allegiance to the Sultan of Zanzibar as well as the end of the native Mzizima political units. The Germans employed what is referred to as 'direct rule' in the conventional literature on colonial administration in Africa. Direct rule, as opposed to indirect rule, meant that the colonial governments ruled the areas by relying on non-natives, particularly on the lower levels of central government and in local governments. The German direct rule used Germans as District Commissioners, *Bezirksamtmann*. Below them there were non-native assistants, who operated at district and village levels. The latter were called *Akidas* and *Jumbes*, respectively. They administered their units, heard civil cases and collected taxes on behalf of the German colonial government. Unlike other District Commissioners in German East Africa, the *Bezirksamtmann* for Dar es Salaam District had little autonomy on city planning and administration. Dar es Salaam was the capital of the territory. The Governor and all other government department seniors resided and had their institutional headquarters in the streets of Dar es Salaam. Some of the departments were the Railway Department and the Department of Lands and Agriculture.<sup>26</sup> The implication of colonial administrators working and living in Dar es Salaam for the development of the city is that the central government participated fully and directly in planning and governing the city. An American historian, H William Rodemann, found out in 1961 that the Governor supervised the affairs of Dar es Salaam City, which was under the *Bezirksamtmann*. The communal district council was composed of five persons, all of whom were Germans.<sup>27</sup> The Governor had the final say over city matters, both technical and administrative, for his "signature was required for [the] majority of documents." This has been interpreted as a symbolic representation of hierarchical, top-down administration of the Germans, as opposed to collegial British administration.<sup>28</sup> Describing the Governor's upper hand in any administrative issue, the historian F S Joelson portrayed the German East Africa Governor as being "almost beyond the law."<sup>29</sup> A good example of the Governor's penultimate decision-making powers over issues

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<sup>25</sup> Curtin, "Medical Knowledge and Urban Planning," 595.

<sup>26</sup> In a famous historic novel about the First World War in German East Africa, the Department of Lands and Agriculture is translated as *Der Abteilung für Landeskultur und Landesvermessung*. See William Boyd, *An Ice Cream War* (London and New York: Penguin Books, 1983).

<sup>27</sup> H. William Rodemann, "Tanganyika, 1890-1914: Selected Aspects of German Administration" (PhD Diss., University of Chicago, 1961): 85-86.

<sup>28</sup> Iliffe, *Tanganyika under German Rule*, 33-34.

<sup>29</sup> F.S. Joelson, *The Tanganyika Territory: Characteristics and Potentialities* (London: T. Fischer Unwin Ltd, 1920), 26.

concerning the was the deployment of an American civil engineer to study the Dar es Salaam drainage problem in 1913.<sup>30</sup> The massive powers of central government on urban matters persisted not only in the British colonial period, but also in the period of post-colonial Tanzania. As will be shown in the subsequent sections, the first and the revised city master plans were not developed by the city local government. Rather, they were prepared by the central government.

Rodemann notes that German Dar es Salaam was governed by the civil district council like all other civil districts. In German East Africa, there were civil and military districts. The civil districts were under civilian administrators as their people were considered less likely to resist colonial rule. On the contrary, the military districts were under military commanders because their people had staged strong, armed resistance against the colonial conquest. Although the proclamation for founding structured civil district councils for German East Africa was issued on 3<sup>rd</sup> July 1899 by Emperor of Germany, the council for Dar es Salaam was founded as early as 1895. The council's (*Kommunalverbände*) main functions were to run market halls and schools with the income generated from "the native inheritance tax" and "the hut and business tax".<sup>31</sup> As shown above, the council members were all appointees of the Governor. One of the five appointees represented the natives, although he was a German. The range of the functions of the council was limited. All concerns about infrastructure, including traffic and drainage systems, were managed by the central government. This is understandable if one considers that the central government influenced the development of the city by imposing the capital status on it and by limiting the responsibilities of the City Council. The council continued performing its original responsibilities until 1910 when the central government enacted the *Municipal Ordinance*. Rodemann says that the *Municipal Ordinance* made Tanga and Dar es Salaam the only cities in the territory whose administrations "were now restricted to the conventional city limits." Whereas the personnel structure remained intact, the responsibilities changed, or rather, increased. Apart from managing schools and markets, the councils – now called the *Stadtgemeinden* – were also responsible for "the maintenance of roads and bridges, the water works, street lighting and street cleaning; ... slaughter houses; ... public health...; the mode of burial and welfare activities; and the protection and encouragement of municipal enterprises."<sup>32</sup> The central government, thus, delegated its former responsibilities to the city authority in a way that is comparable to the way that is done in the contemporary Global North cities.

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<sup>30</sup> Tanzania National Archives (herein TNA), 450/39/10: Report by Dr. Orenstein on Dar es Salaam.

<sup>31</sup> Rodemann, "Tanganyika", 84.

<sup>32</sup> *Ibid.*, 85.

The funds for the *Stadtgemeinden* to implement its functions were derived from various kinds of fees, municipal residential and business taxes, land sales as well as central government subsidies. Still, all the decisions made in any aspect of infrastructural development in the city required the consent of the Governor.<sup>33</sup> Land tax became common from 1905, after the government “issued a decree that all persons whether natives or non-natives in occupation of fiscal or crown lands should pay a yearly rent for every dwelling house erected on such land.”<sup>34</sup> It appears that the justification for this measure was the fact that the city’s “ordinary and extraordinary” expenditure was drawn by the central administration which, in turn, submitted its budget to “the budget committee to the Reichstag and to the Bundesrat.” The Reich, the German Federal Government, was supporting almost half the annual expenditure of the German East African state in the form of aid and loans.<sup>35</sup> This implies that, throughout the German colonial period, the central government had a veto and an upper hand on the direction of Dar es Salaam.

It is also important to note that, of all historians of German East Africa, it is Rodemann who offers a concise but faint description of the German technical personnel. His account indicates that most of the colonial personnel were male Europeans whose numbers grew steadily, starting in 1900. By 1913, there were 327 engineers and 429 mechanics and workmen in the territory.<sup>36</sup> Notwithstanding the fact that the engineers’ level of education was not identified such numbers of technical experts entail that the Germans were very serious about infrastructural development, considering the fact that there was a limited industrial sector in the territory. As will be shown in the subsequent sections, the European engineers’ figures were never matched or exceeded by the British throughout their 43 years of ruling Tanganyika, not even by one-third of 327 German engineers. This discrepancy was not accidental. It was a manifestation of the circulation of the two distinct engineering cultures in a colonial context. The German engineering culture was elitist and demanded serious and meticulous training before one was allowed to do any technical work. The German engineering culture embraced serious training of a largish number of technical experts, whereas the British one was, up to the 1980s, indifferent to the training of a large number of such experts.<sup>37</sup> The huge number of German engineers and other kinds of technical experts is perhaps as a representation of a weighty concern about technological circulation. That is, the Germans were not only circulating their national engineering culture but also the pace of spatial, technological and economic transformation, which had enabled them to overtake the British in Europe. Thus, when

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<sup>33</sup> *Ibid.*, 86; See also Iliffe, *Tanganyika under German Rule*, 89.

<sup>34</sup> Tanganyika Territory, *Annual Report of the Land Department 1929* (Dar es Salaam: The Government Printer, 1930), 7.

<sup>35</sup> Rodemann, “Tanganyika”, 107.

<sup>36</sup> *Ibid.*, 181.

<sup>37</sup> Austen Albu, “British Attitudes to Engineering Education: A Historical Perspective” in *Technical Innovation and British Economic Performance*, ed. Keith Pavitt (London and Basingstoke: Macmillan, 1984), 67-87.

the British came to colonise the former German East Africa, they did not implement many technical projects for over two decades. They were mainly preoccupied with maintenance and repair of the German technical legacy.

Historians of Dar es Salaam, both local and foreign, have not examined the administration of the city during the German colonial time well. The German historian Jürgen Becher would have filled the gap, but his interest was in showing the functional significance of the city and comparing it with other major urban centres of Tanga and Tabora.<sup>38</sup> Hence, what we have is a sketchy, simulacra reconstruction of German Dar es Salaam. Some of the reasons for knowledge gap over German urban administration include not only the lack of archival records but also the linguistic weaknesses as all the German records are in old German writing. Other critical records of the German period were destroyed during the First World War.<sup>39</sup> These challenges are so telling as most of the city's historians come from Anglo-phone countries, especially Tanzania, the United Kingdom and the United States of America. There are also a few Dar es Salaam historians who come from France, Germany and other European countries. Arguably, their interests, as shown in the introductory chapter, have been in issues of politics, land use, culture, labour, population control, energy production, and crime. This work faces similar limitations in terms of examining in detail the district administration of German Dar es Salaam. It is, thus, forced to utilise the sources written in English, which invariably carry the British anti-Germany narrative, implicitly or explicitly. A good example of the British anti-Germany narrative is identified by Rodemann in his unique account of the statistics for the administrative personnel of German Dar es Salaam:

The German administration in German East Africa has been characterized as a failure for four reasons. First, the authors Sayers and Datta have accepted the view of the first post-war Command Paper on Tanganyika that “for the whole of German East Africa, i.e., for an area of 385,000 square miles, with a population of seven and a half millions, the Germans had in 1914 an administrative staff of 79 Europeans.” Secondly, the German system of native administration – the employment of Islamized Akidas and Jumbes – was not successful because of their corruption and indifference to native custom.<sup>40</sup>

To Rodemann, the British anti-Germany narrative was responsible for the above “misleading presentation of the facts,” because it excluded the 80 Germans who were in various central government departments in Dar es Salaam and the military personnel who also were used in administration.<sup>41</sup> Writing 10 years after Rodemann, John Iliffe offered more illuminating evidence

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<sup>38</sup> Becher, *Dar es Salaam, Tanga und Tabora*.

<sup>39</sup> Reginald E. Kirey, “Burying, Unearthing and Archiving German Colonial Records in Tanganyika, 1914-1960s” in *Tanzania Zamani* 12 (2) (2020): 141-180.

<sup>40</sup> Rodemann, “Tanganyika”, 111.

<sup>41</sup> *Ibid.*, 112.

that shows that all departmental heads, *Referate*, resided in Dar es Salaam, thus increasing the number of the colonial personnel to more than 319 civil officials by the end of 1907.<sup>42</sup>

Like Rodemann, I contend that the balanced and richer accounts of Dar es Salaam administration from the secondary sources covers well the period from the British colonial period to the present. This chapter covers the interwar period; hence, the details are about the early British district administration. It should be pointed out at this juncture that at the top of the city's administrative hierarchy during the German colonial period was the Governor, who was assisted by a municipal council. Infrastructural works were defined by the council and were built by the council itself or the German civil engineering companies that won construction tenders. As will be shown later, the engineering works done under such less elaborate institutional set-up did not match those of their successors, the British, for more than three decades of their rule. This is because the British mainly concentrated on maintaining and repairing the German technological materiality "which was regarded" by British civil engineers "as something of a showpiece, and their period of rule, by the standards then prevailing."<sup>43</sup>

### 3.1.2 British Infrastructure Regimes

German East Africa was the main belligerent ground in Africa for the First World War (WWI). Of the four territories Germany had in Africa, it was only German East Africa where the Germans did not lose the battle. As a result, the WWI belligerence had to go on until 1918. Perhaps, it was the size of the territory, its profitability, its level of infrastructural development and its vast terrain, which made it possible for the Germans to resist the allied forces longer than elsewhere. Its capital – Dar es Salaam – fell to the allied forces in late 1916. And when the Germans surrendered in 1918, the British and the Belgians occupied German East Africa under the terms of the League of Nations. The occupation led to the formation of three modern-day territories, namely Rwanda, Burundi and Tanganyika (Mainland Tanzania). Tanganyika, the biggest of the three territories, became a mandate territory of the League of Nations and was placed under the British. The smaller territories of Rwanda and Burundi became mandate territories and were placed under the Belgians. Although this work is about Dar es Salaam City, which became the capital of Tanganyika, does not cover the aforementioned Belgian territories.

Dar es Salaam was the most vital place during WWI because it was the seat of government. Unlike in the other towns, the British carried out numerous and detailed intelligences gathering before they invaded the city. In the collated intelligence report of January 1916 produced by the

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<sup>42</sup> Iliffe, *Tanganyika under German Rule*, 34, 82.

<sup>43</sup> Institution of Civil Engineers (ICE), MSS. Afc. S.1021: The Professional Engineer in an Emerging Territory

British War Office, the collected information was so elaborate and exact that the Intelligence Division labelled it *A Handbook of German East Africa*. Whereas the other towns were described in a superficial manner, Dar es Salaam was covered in a detailed manner, including its spatial plan. The report was the first suggestion that the British were familiar with the racial narratives in their official records and correspondences as evidenced by the use of the term 'Negro Quarter' to refer to indigenous African locations. It also signalled that the British would impose spatial racial segregation should they seize the city. It was reported that the city had about 25,000 people with "330 coral stone houses and 1,400 clay huts."<sup>44</sup> Water was said to be "plentiful" in the city. The major means of transport for the Europeans, Asians and rich natives were bicycles and the Asian commercial district, which, during the British colonial period, was the dirtiest part of the city, was "kept remarkably clean,"<sup>45</sup> The intelligence report provides compelling evidence which, when corroborated with other primary sources and the secondary sources, vindicates the judgement that the Germans did greater work in the city than the British did. The Germans not only built and maintained the infrastructure but also transformed both the built and natural environments. The new natures, taking after European modernity visions and landscapes, were cleaned to the extent that dirt was unknown in the city.<sup>46</sup> In the interwar period, such new natures were the benchmark against which the British urban and technological governance was assessed by the Germans in Europe and Africa, especially in the 1930s when voices for the return of German colonies were strong.

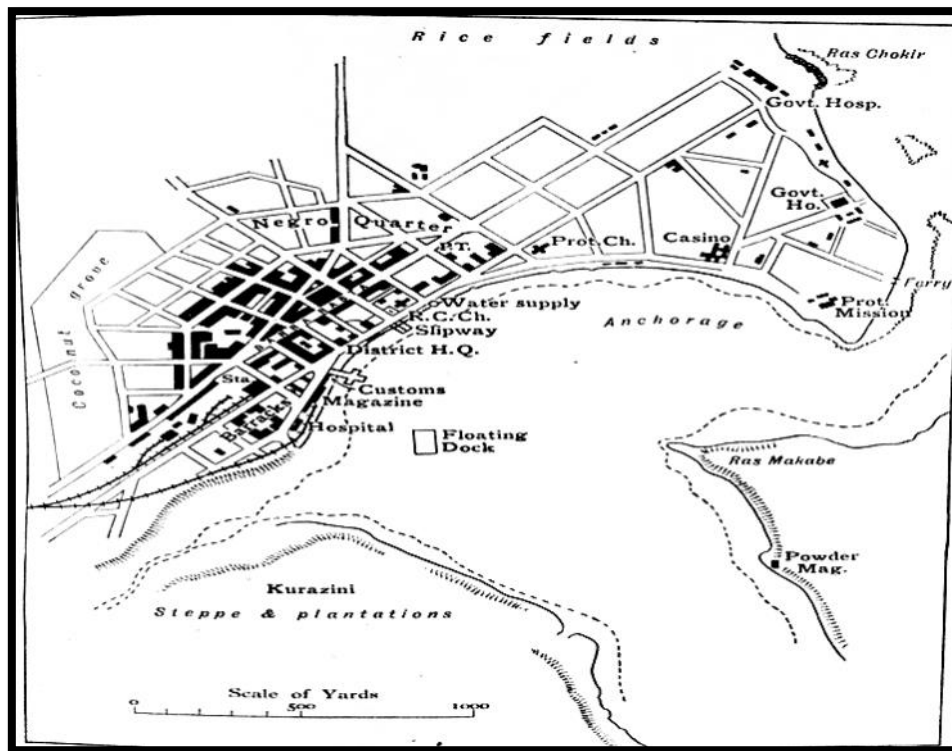
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<sup>44</sup> United Kingdom, *A Handbook of German East Africa* (London: Admiralty and the War Office, 1916), 177.

<sup>45</sup> *Ibid.*, 180.

<sup>46</sup> Cf. Calvert, *German East Africa*.





**Figure 3.3** A Sketchy Plan of German Dar es Salaam in Early 1916  
**Source:** *United Kingdom, A Handbook of German East Africa* (London, 1916).

Documented in the annual reports submitted to the League of Nations by the British London government from 1918 onwards, in the colonial departmental and district reports on Dar es Salaam as well as in the popular historical non-fictitious and fictitious works such as *An Ice Cream War* by William Boyd, British Dar es Salaam generally had all the basic infrastructure for it to function. The infrastructure, though incipient, was damaged during WWI. Thus, when the British took over Dar es Salaam the main task was reconstructing the infrastructures through repair and maintenance. Repair and maintenance of the German technological legacy, coupled with the British reluctance to invest not only in urban infrastructure building but also in territorial large technical systems, became the sole task of the British between 1918 and 1947.<sup>47</sup> British underinvestment in infrastructure was caused by limited funds received from London and by the low qualifications of its colonial staff.<sup>48</sup> In what was perceived by the British London government as a propaganda book, *Black and Beautiful*, which was published in 1938, the anonymous Italian author criticised the lack of repair and maintenance of the German-built infrastructure. The author blamed the British for not maintaining some of the German roads in Tanganyika; as a result, the roads turned into

<sup>47</sup>Frank Edward and Mikael Hård, “Maintaining the Local Empire: The Public Works Department in Dar es Salaam, 1920-1960” in *Transport History* 41, no. 1 (2020): 27-46.

<sup>48</sup> Andrew Roberts, “The Imperial Mind” in *The Cambridge History of Africa: From 1905-1940*, eds. J.D. Fage & Roland Oliver (Cambridge: Cambridge University Press, 1986): 24-76, here at 28.

forests. Sir Donald Cameron, the governor of Tanganyika, was concerned about it and called for action in response to the book's criticism, but did not specify the kind of action that should be taken.<sup>49</sup> Although the 1930s witnessed heightened German propaganda over Britain and on her former colonies to the extent that the German government said the 1936 food shortages had been caused by the British control of Tanganyika,<sup>50</sup> one can hardly ignore the fact that the British did not invest in serious repair, maintenance and construction in Dar es Salaam until the Colonial Welfare and Development were funds remitted, beginning in 1947. In other words, what the Germans were saying was not all propaganda, since the British were doing very little to 'develop' the territory. The fact that serious infrastructural development was dominant in the post-war era has been discussed in detail by historians John Iliffe in the case of Tanganyika and by Nancy J Jacobs in the case of the African continent in general using a concept that was coined by Low and Lonsdale in 1976, the "second colonial occupation".<sup>51</sup>

In an attempt to repair and maintain the German-built large technical systems in Dar es Salaam and in other parts of Tanganyika, the British had to rely on the quasi-Public Works Department (PWD) of the military. This quasi-PWD was led by military engineers from the late 1916 to about 1920 when the administration of Tanganyika was transferred from military to civilian administration. Civilian rule began with the appointment of Sir H A Byatt as governor who was to be assisted by an executive council in administering Tanganyika.<sup>52</sup> A report presented to the United Kingdom parliament in July 1921 indicates that, between 1918 and 1920, the quasi-PWD did not exist as an institution. Rather, it existed as a programme of works under the military. The reports add that "no new works were entered upon as it was realised that conditions were too uncertain to permit of any expenditure being incurred except such as was urgently required for maintenance."<sup>53</sup> In Dar es Salaam, the focus was on repairing the war-damaged technical systems such as roads, bridges, the water supply, drainage, street lighting, the electric power station and railway crossings. The report uses such words as maintenance, clean, repair, rebuilt, and reconstruction to imply restoration of the pre-WWI state of infrastructure by reconstructing the damaged parts of the technical systems and ensuring that they continue functioning optimally. This is the case even in the contemporary technological cultures of the Global North. In the United States of America, for

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<sup>49</sup> British National Archives (herein BNA), CO 691/169/15: Tanganyika: Charges against British Administration.

<sup>50</sup> G.L. Steer, *Judgement on German Africa* (London: Hodder and Stoughton Ltd, 1939), 19, 325; P.H.C. Clarke, *A Short History of Tanganyika: A Mainland of Tanzania* (Arusha: Longmans, 1966), 125.

<sup>51</sup> See John Iliffe, *A Modern History of Tanganyika* (Cambridge: Cambridge University Press, 1979), 436-484; Nancy J. Jacobs, *African History through Sources: Colonial Contexts and Everyday Experiences, c. 1850-1946*. Vol.1 (New York: Cambridge University Press, 2014), 307-308.

<sup>52</sup> United Kingdom, *Report on Tanganyika Territory, Covering the Period from the Conclusion of the Armistice to the End of 1920* (London: His Majesty's Stationery Office, 1921), 37.

<sup>53</sup> *Ibid.*, 88.

instance, the Office of Transportation Maintenance states that the maintenance of drainage and roads has to “preserve the originally constructed” networks.<sup>54</sup>

In another case, the temporary administration of Dar es Salaam in 1919 outlined a number of public works that were to be executed in the city. Most of what appeared to fall within the realm of technical repairs was labelled “New Works”.<sup>55</sup> They included such works as the repair of drainage, sewerage, public laundry and road culverts. What does this mean to a historian of technology? The British authorities in Dar es Salaam and London – local and imperial – were concerned with repairing and maintaining the German technological legacy because they were extremely dependent on it for efficient colonisation of the territory. The administrators in Dar es Salaam, coming from a Global North technological culture of the day, could not conceive living in a colony without such technical systems. This is not accidental. Technologies tend to create vulnerability to users when they become part of their everyday life. Scholars of science and technology, Wiebe Bijker, Anique Hommels and Jessica Mesman, contend that such “vulnerability is an emergent property” of technological systems.<sup>56</sup> It was that vulnerability which made the British establish the permanent PWD in 1921. For over three decades, the primary task of the PWD was maintaining and repairing the existing infrastructure and structures more than in building new infrastructure. Thus, it is not surprising that the annual reports of the PWD and Medical Department produced from 1921 to about 1949 had more accounts of repair and maintenance than construction.

The PWD had a director who served the whole territory and resided in Dar es Salaam as similar technical personnel of German East Africa did. While sources do not reveal the exact date of establishing the PWD, which operated until the end of British colonial rule, it is highly likely that it was established in 1921. This is because many government departments, some of them part of the executive council, were founded in 1920 and 1921. A good example is the Department of Land, Survey and Mines, which was founded in 1920 and which was split into three autonomous departments in 1926.<sup>57</sup> Although it has been argued above that the British colonial administration was more collegial than the German one, the PWD as well as the Lands Department were in most cases receiving orders and instructions from the governor, provincial commissioner or the Medical

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<sup>54</sup> Office of Transportation Maintenance, *Highway Maintenance Guidelines* (New York: State Department of Transportation, 2009).

<sup>55</sup> See “Summary of Report on New Works required in Daressalaam” in TNA, 450/39/10: Report by Dr. Orenstein on Dar es Salaam.

<sup>56</sup> Wiebe Bijker, Anique Hommels and Jessica Mesman, “Studying Vulnerability in Technological Cultures” in *Vulnerability in Technological Cultures: New Directions in Research and Governance*, eds. A. Hommels, J. Mesman and Wiebe E. Bijker (Cambridge & London: The MIT Press, 2014), 6-7.

<sup>57</sup> Tanganyika Territory, *Annual Report of the Land Department 1929* (Dar es Salaam: The Government Printer, 1930), 1.

and Sanitary Services Department. In the development of the drainage and traffic infrastructure in Dar es Salaam, which under normal circumstances would have been a monopoly of the PWD, the Medical Department opinion was more influential to the government seniors and above the PWD. Similarly, the Medical Department had powers over urban planning rather than the technically capable Lands Department. This situation resulted from the British administrative system, which had some hierarchy, contrary to what has been argued by the historian John Iliffe.<sup>58</sup> In the Central Town Planning and Building Committee, the director of the Medical Department was a chairman, whereas the directors for the PWD, Lands and Survey as well as the chief government architect were mere members.<sup>59</sup> Furthermore, the Medical Department did not want to leave the sanitary and anti-malarial works to the PWD. In particular, the department solicited the recruitment of the sanitary engineer who would be attached to the Medical Department, despite the fact that the PWD had the capacity to execute any civil engineering project and had, in principle, objected to the move.<sup>60</sup> The presence of a sanitary engineer, who was not attached to the PWD, in Dar es Salaam from the mid-1920s to mid-1930s proves that the wishes of the Medical Department were always granted.

At a more localised level, the government had also a tradition of appointing the medical officers of Dar es Salaam as executive officers of the township. This development was backed by Government Notice No. 48 of 1923.<sup>61</sup> By virtue of this appointment, the medical officers were the administrators of the township, from whom PWD engineers took orders. The medical officers were also supposed to supervise the anti-malarial and sanitary works. Although they enjoyed being lent ears by senior administrators and technical personnel, they were overwhelmed by the range of administrative, engineering and medical responsibilities. In 1929, for instance, the Medical Department mentioned in the annual report that the post of Executive Officer of Township Authority and engineering tasks were reducing their capacity to deal with health challenges. Thus, they wished “the P.W.D. takes over the supervision and maintenance of all works of an engineering nature” so that “the position of the Health Office would be materially eased.”<sup>62</sup> They also requested reorganisation of the Township Authority, which culminated in their replacement by the municipal secretary, a non-medical officer, in 1932.<sup>63</sup> In spite of these changes, which were in their favour

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<sup>58</sup> Iliffe, *Tanganyika under German Rule*.

<sup>59</sup> Tanganyika, *Land Department*, 2.

<sup>60</sup> See letter from Governor Donald Cameron to Secretary of State L.C.M.S. Amery in TNA, 450/46/8: Sanitary Engineer. The need for Sanitary Engineer was stated in the annual report of the Medical Department for 1923.

<sup>61</sup> Tanganyika Territory, *Annual Medical and Sanitary Report 1923* (London: The Crown Agents for the Colonies, 1924), 46.

<sup>62</sup> *Idem*, *Annual Medical and Sanitary Report 1929* (Dar es Salaam: The Government Printer, 1930), 46.

<sup>63</sup> Letter from Chief Secretary to District Officer T.P.S. Dawkins dated 30.05.1932 in TNA, 61/602: Township Authority Reorganisation.

once again, the medical officers continued to exert influence on sanitary and anti-malarial engineering tasks as well as on urban planning. On the latter, for instance, they gave building and demolition permits in Dar es Salaam until 1950 when the town planning department.

With the interlacing of engineering, medical and spatial planning together with administrative roles, the PWD was more of a department waiting for orders and instructions from other government hierarchies, both those superior and equal to it, as we have seen in the case of the influence of the Medical Department than that of the PWD. The PWD were merely a technical agency which designed technological structures and systems, while decision-making was subject to correspondences between the township or district, provincial and national authorities. As such, there was no collegiality in decision-making and budgeting. Indeed, the British PWD had its autonomy reduced so much that it only executed the projects directed from upper echelons of administration in a more comparable way to the German public works units. The first interpretation this administrative trapping is that the engineering profession was disdained by other professions in the colonial administrations in the Global South. The disdain informs us of the technological dialectics that occurred in making and designing the Dar es Salaam and Global South technical systems. The opposition to the unfortunate situation 1937, which led to the re-organisation of the PWD and the clarification of its functions, is one of the things that show the existence of a contested technical terrain in the territory.<sup>64</sup> The second interpretation is in concord with Gabrielle Hecht's concept of technopolitical regimes<sup>65</sup> as technological issues were decided by two layers, the political and technological layers, with the political group enjoying the final say in decision-making.

If one compares the story of Dar es Salaam with the story of the Global North's era of sanitary movement, one notices that the engineering profession was understated so much to the extent that the momentous achievements were credited to social reformers like Sir Edwin Chadwick and medical doctors like Dr John Snow.<sup>66</sup> In a fundamentally class society of the United Kingdom,<sup>67</sup> some studies have linked the low social status of the engineering education and profession as a key factor for Britain lagging behind Germany, France, the United States of America and Japan in the development of science and technology since the 19<sup>th</sup> century.<sup>68</sup> This convergence

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<sup>64</sup> BNA, CO 691/168/7: Public Works Department – Reorganisation; Tanganyika Territory, *Annual Report of the Public Works Department 1937* (Dar es Salaam: The Government Printer, 1938), 4.

<sup>65</sup> Gabrielle Hecht, *The Radiance of France: Nuclear Power and National Identity after World War II* (Cambridge: The MIT Press, 2009), 16.

<sup>66</sup> See Michelle Allen-Emerson, *Sanitary Reform in Victorian Britain: Sanitary Engineering*. Vol. 3 (London: Pickering & Chatto, 2012); Amanda J. Thomas, *Cholera: The Victorian Plague* (Barnsley: Pen & Sword, 2015).

<sup>67</sup> Cf. Selina Todd, *The People: The Rise and Fall of the Working Class* (London: John Murray, 2015); Marjorie J. Mbilinyi, "Education in the British Colonial Period (1919-1961)" in *Proceedings of Historical Association of Tanzania Conference* (Dar es Salaam: University of Dar es Salaam, 1974).

<sup>68</sup> Albu, "British Attitudes to Engineering Education".

between the colonising Global North and the colonised Global South in the place and role of the engineering profession denotes the nature of circulating technological cultures. This means that, during circulation, the appropriation processes were epiphenomenal. The actors sought to maintain technocratic cultures as transferred from their home countries. The broader consequence is that it would take the Global South native users of urban infrastructure a long time to understand, appreciate and appropriate the new technological cultures. It is no wonder then that it was easy for the colonising actors to limit the spread of the Global North contemporary modern urban technical systems to their streets at the expense of the native Global South subjects.

Despite the low status of the PWD within the colonial technological regime, the PWD showed that engineering professions were elitist and racial. One manifestation of elitism within the PWD was the fact that the senior and permanent employees between 1921 and 1950 were, to a large extent, British. Only a small number of Asians occupied middle and junior level positions. Native Africans were invariably employed as temporary, casual, unskilled and semi-skilled labour gangs. Perusing annual reports produced by the PWD from 1920s to 1950, one discovers that the racial aspect was very important in the reportage style. One will also discover that the reports provided accounts of the European and Asian workers in terms of their professions and figures, while the Africans were either listed as labour gangs or gang supervisors, or were not mentioned at all. This reportage understated the fact that colonial PWD was labour intensive. As such, this is equivalent to contending that the early British PWD depicted denial of the run-of-the-mill actors in the making and development of urban technologies in Dar es Salaam. The denial was rife in recognising and appreciating the work done by ordinary and casual labourers as the reports were conspicuously silent on them. Although no work has examined the sociological implication of this silence, it is very possible that the ordinary labourers felt that they were outsiders in the projects they were implementing. This affected the appropriation of engineering technology and the care for the built technical systems.

## **3.2 Spatial Zoning**

### *3.2.1 The Colonial Segregation Continuity Narrative: Myth and Reality*

The literature on Dar es Salaam which is, by and large, a socio-economic and political history shows that there has been a strong nexus between spatial and infrastructural configurations since the colonial days. This situation is not uncommon on the African continent and the rest of Global South. Spatial configurations in colonial urban Africa were epitomized by new land-use practices, land laws and new settlement planning. In their totality, these aspects symbolised new forms of control through space. In the British colonies, they were fulfilling the self-proclaimed

crusade dubbed as “the White man’s burden” in which transforming the colonies, their environment and people were inevitable on humanitarian and moral grounds. A British imperial historian, Andrew Porter, asserts that this crusade was influenced by a British-American poet Rudyard Kipling. Kipling wrote a poem in 1899 encouraging the colonial powers to civilize the colonial lands and people because its masses were “sullen peoples, half-devil and half-child.”<sup>69</sup> Ulrike Lindner argues that such racist tendencies were not limited to the British alone. Literally, all European colonial policies were influenced by “racist and social Darwinist theories.”<sup>70</sup> Infrastructural development became an important ingredient in spatial re-organisation.<sup>71</sup> They were introduced with many objectives. They included facilitating colonial control and exploitation, controlling diseases and representing modernity. Most often than not, spatial re-organisation processes preceded the building of infrastructure in the typical colonial cities like Dar es Salaam. In other words, urban plans were made prior to the building of infrastructure. But in places like Zanzibar, where the Oman Arabs had deeper historical influence, the British urban plans did not work out owing to the spatial configurations that were already in place.<sup>72</sup>

The British planning model introduced strict spatial segregation along racial lines as opposed to the former German functional zoning. The British racial zoning replaced the German functional zoning, which provided the basis of spatial planning. As German archival records reveal, the city’s population comprised *einheimische*, *Siedler* and *Asiaten*, literally translated as native, settler and Asian.<sup>73</sup> The British used this population composition to rigidly segregate the racial groups in the urban residential sectors. “Racial segregation in South African towns was rationalised on grounds of hygiene, and when [Lord] Milner became colonial secretary he espoused academic schemes on similar lines.”<sup>74</sup> Andrew Burton indicated that, in Dar es Salaam, the British also used “the insanitary conditions perceived to be prevalent in African township” to execute spatial segregation between Africans, Asians and Europeans.<sup>75</sup> Burton interpreted this as a sign of British

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<sup>69</sup> Andrew Porter, “Introduction: Britain and the Empire in the Nineteenth Century” in *The Oxford History of the British Empire: The Nineteenth Century*, ed. A. Porter (Oxford & New York: Oxford University Press, 1999), 24.

<sup>70</sup> Ulrike Lindner, “New Forms of Knowledge Exchange Between Imperial Powers: The Development of the Institut Colonial International (ICI) Since the End of the Nineteenth Century” in *Imperial Cooperation and Transfer, 1870-1930: Empires and Encounters* edited by Volker Barth and Roland Cvetkovski (London: Bloomsbury, 2015), 57-78, here at 60.

<sup>71</sup> John Broich, “Engineering the Empire: British Water Supply Systems and Colonial Societies, 1850-1900”, *Journal of British Studies* 46, no. 2 (April 2007), 347.

<sup>72</sup> William Cunningham Bissell, *Urban Design, Chaos, and Colonial Power in Zanzibar* (Bloomington & Indianapolis: Indiana University Press, 2011).

<sup>73</sup> Bundesarchiv, Reichskolonialamt R1001/309: Bild 105-DOA0968.

<sup>74</sup> Roberts, “Imperial Mind”, 50.

<sup>75</sup> Andrew Burton, *African Underclass: Urbanisation, Crime & Colonial Order in Dar es Salaam* (Dar es Salaam: Mkuki na Nyota, 2005), 50.

intolerance of urban Africans. At least “the Germans displayed greater tolerance towards African urbanisation,” he adds.<sup>76</sup>

Another historian, James Brennan, argues that the separation of residential areas was necessary because the British wanted to “protect indigenous people from the encroachment of outsiders,” which “systematically invoked the categories of native and non-native” races that are very common in the colonial records.<sup>77</sup> They used cultural preservation to conceal their racism and economic class characters exhibited in their other colonies and in Britain. They, thus, used cultural paternalism to implement a broader racial policy: “Africans should ‘develop along their own lines.’”<sup>78</sup> Unlike in Tanganyika, in Nigeria and Uganda racial segregation in urban areas was not successful.<sup>79</sup> To make the implementation of their policy successful and legal in Dar es Salaam, the British enacted the *Land Ordinance* of 1923, which gave the powers to remove inhabitants from public lands and areas in which they were, by virtue of race, not permitted to settle. It was through the ordinance that plots of land had racial labels: native, Asian and European. While during the German era the racial labels were showing population composition, during the British era the labels were used in spatial planning and in establishing social interaction controls. In the post-WWII, the labels permeated the political representation field in which constituents were to have African, Asian and European representatives (see Figure 3.4). They also percolated into the welfare and recreational gatherings of women in Dar es Salaam, in which the attendance and sitting arrangements had to reflect the triple racial heritage of the territory.

The 1923 *Land Ordinance* was a legal culmination of the five-year meetings of the Central Building and Town Planning Committee which were held between 1918 and 1922. The committee members were the Principal Medical Officer as chairman, the Director of Public Works, the Land Officer and Senior Sanitation Officer as Secretary and Executive Officer.<sup>80</sup> The Medical Department was influential in spatial planning throughout the British colonial period, which explains why hygiene was a paramount justification for doing spatial planning. The committee decided between 1918 and 1920 that in Dar es Salaam “an area is to be set apart as [an] European residential quarter” and “an area about 300 yards wide has been marked down as a neutral zone in which no building will be permitted and within the limits of which it is hoped, in course of time,

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<sup>76</sup> Burton, *African Underclass*, 45.

<sup>77</sup> James R. Brennan, “Nation, Race and Urbanization in Dar es Salaam, Tanzania, 1916-1976” (PhD Diss., Northwestern University, 2002), 18.

<sup>78</sup>C.C. Wrigley, “Aspects of Economic History” in *The Cambridge History of Africa: from 1905 to 1940* edited by A.D. Roberts (Cambridge: Cambridge University Press, 2001), 131.

<sup>79</sup> Roberts, “Imperial Mind”, 51.

<sup>80</sup> Tanganyika Territory, *Annual Report: Sanitation Branch of the Medical Department, 1921*, 155 in BNA CO 736/13: Tanganyika – Executive Council Meetings, 1920-1934.



to demolish existing huts and shanties. To the east of this neutral zone no native hut will be allowed to stand.”<sup>81</sup> The 1923 ordinance provided funds for surveying about 500 native plots west of the old German city so that all the Africans who were living in the proto-city could be evicted. By March 1923, 200 plots of land had been surveyed and their distribution to the Africans was about to commence.<sup>82</sup> Evictions began in 1925 and, by 1933, some of the Africans had started resisting their removal from the old city; thus, a “civil action was taken to obtain their eviction, and during the year ejection orders were made by the Court . . . in the clearance of a neutral zone between the business area of the township and the native quarter.”<sup>83</sup> The neutral zone, dubbed ‘Open Space’ in other archival sources, was a physical separation which was about 270 metres wide and 2 kilometre long.



**Figure 3.4:** Tanganyika’s First Women MPs in 1955: European, African and Asian Women  
**Source:** *United Kingdom, Report of Tanganyika for the Year 1955* (London, 1956).

<sup>81</sup> Tanganyika Territory, *Sanitation Report, November 1918 to November 1920*, 53 in BNA CO 736/13: Tanganyika – Executive Council Meetings, 1920-1934.

<sup>82</sup> *Mambo Leo*, No. 3, March 1923.

<sup>83</sup> Tanganyika Territory, *Annual Report of the Land Department 1933* (Dar es Salaam: The Government Printer, 1934), 8.

Although the evictions were backed by the 1923 legislation, they were in practice a forceful land alienation without the owners being given any compensation. It is important to highlight the fact that, during the German period, land for public and private use used to be purchased from the Africans. This differentiates the German approach from the British one as the British undertook land alienation without seeking the consent of the owners or paying them. The German practice was commended even by the later British administrators in Dar es Salaam, for example the former district commissioner, Mr H H McCleery, who commended the Germans for not alienating Africans from their lands by force.<sup>84</sup> Under the Germans, it “was an obligation on the” land “owner to give up to the Government at cost price land required for public works”, wrote A Greig, the Land Officer in British Tanganyika in 1930.<sup>85</sup> F S Joelson, an early British commentator on former German East Africa, wrote in 1920 that “the lordly whites [Germans] did not scruple to expropriate them [Africans] from the coveted spots that they had occupied for years, and to restrict them to a well-defined location.”<sup>86</sup> There are no sources on land matters written by Africans. Thus, we cannot know Africans’ view over German and British zoning. This limitation makes us susceptible to taking ideological impressions made by the source producers – the Europeans. However, the infrastructural services provided in African areas have received numerous responses, which are discussed in detail in the next section of this chapter.

Spatial zoning in Dar es Salaam began during the German colonial times when the metropolitan zoning variant circulated from Europe to German East Africa. The European variant treated the “town as a living organism, whose development both deserves and needs to be controlled with utmost thought and care.”<sup>87</sup> The key features of the town included the presence of good traffic infrastructure and public health-like systems of sewage, drainage and street cleaning. Infrastructural services, building and cleaning, were had to come up to a certain agreed standard in order to achieve some uniformity. These services fell under the jurisdiction of municipal administrations, thus leading to the ascendancy of what T C Horsfall calls ‘municipal socialism’.<sup>88</sup> Under municipal socialism, urbanites were to reside in towns and cities, enjoying the infrastructural and cleaning services offered collectively by the municipal government. They were free to build houses, but they were required to conform to certain standards. In Germany, these developments took place at a time when the population was rising and when epidemics like cholera had left critical lessons. In

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<sup>84</sup> Bodleian Library (formerly Rhodes House Collections), Dar es Salaam Extra Provincial Book V.I-II

<sup>85</sup> Tanganyika Territory, *Annual Report of the Land Department 1929* (Dar es Salaam: The Government Printer, 1930), 3.

<sup>86</sup> Joelson, *Tanganyika Territory*, 23.

<sup>87</sup> William Harbutt Dawson, *Municipal Life and Government in Germany* (London: Longmans, Green & Co., 1914), 141.

<sup>88</sup> T.C. Horsfall, *The Improvement of Dwellings and Surroundings of the People: The Example of Germany* (Manchester: University Press, 1904), 139-146.

the city of Cologne, for instance, the zoning system saw the city attain four zones which were defined by the types and colour of buildings.<sup>89</sup> Failure to conform to the standards would attract an intervention from the municipal authorities.

The Germans introduced the zoning system in Dar es Salaam in 1891. They introduced the system using master plans. Since the area was largely underpopulated and less built, they planned a small area in grid form, from the harbour to the near inland. The area that was planned was relatively plain. With roughly less than 6 square km, the area was bordered by the Msimbazi and Gerezani creeks to the north and south, respectively. To the west it was bordered by the coconut farms of the native Zaramo people and ended in what today are known as Bibi Titi Mohamed Road and Ali Hassan Mwinyi Road.<sup>90</sup> Grid planning was a Global North ideal in the peak of high modernism, which developed together with the zoning system. The German plans were used to build dirty roads across Dar es Salaam. They used building codes to distinguish residential, commercial and government streets.<sup>91</sup> Like the building of other kinds of infrastructure, the building of roads relied heavily on the use of “forced labour and were narrow and often with trees on either side.”<sup>92</sup> Unlike the sanitary, water and electric infrastructure, the roads built in the city were equally distributed in all the planned areas, regardless of the racial differences of the beneficiaries. “In this pleasant town of avenues even the streets of the native location are boulevards.”<sup>93</sup> Whereas the northern and eastern areas were reserved for building white settlements and public institutions, the central parts were reserved for commercial activities, mainly undertaken by European and Asian merchants. The southwestern areas were reserved for residential purposes and were dominated by Africans. The 1892 plan for Dar es Salaam, which was modified in 1893, introduced building codes –*Bauordnung*– which had to be adhered to by all the urbanites in the city. The building codes were used to introduce elements of municipal socialism in the city. Equally important, the Germans used them as a tool for appropriating the German zoning system in Dar es Salaam.

Looking critically at the building codes, the buildings were not mere structures with certain standards. They reflected certain class taste, interests and ideology, particularly through the architectural designs, building materials and spatial distribution. The sociological scrutiny of urbanites in the city reveals that the first urbanites were German colonial officials, soldiers and merchants; Indian and Arab merchants; and African soldiers, labour gangs and domestic servants

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<sup>89</sup> Horsfall, *Improvement of Dwellings*, 146.

<sup>90</sup> These roads are described well in Laura Sykes and Uma Waide, *Dar es Salaam: A Dozen Drives around the City* (Dar es Salaam: Mkuki na Nyota, 1997), 23-4, 54-58.

<sup>91</sup> Kironde, “Land Use Structure of Dar es Salaam”; Karl Vorlaufer 1970.

<sup>92</sup> P.H.C. Clarke, *A Short History of Tanganyika: A Mainland of Tanzania* (Arusha: Longmans, 1966), 107.

<sup>93</sup> Joelson, *Tanganyika Territory*, 36.

who came from outside Dar es Salaam. Given the composition of the city, it is correct to argue that German Dar es Salaam was a city of immigrants of all racial groups. This was the time when the monetisation of the economy was beginning to replace the old barter economy, in which goods and services were exchanged with goods, and not money. It is contended here that the *Bauordnung* were adapted to the socio-economic conditions of the urbanites to make the city inclusive and accessible to all racial groups. Four reasons support this contention. First, the roads, as the master plans depicted, were built in relatively the same width and status throughout the city: they were all dirt roads.<sup>94</sup> Secondly, the *bauordnung* introduced “various standards of building” by taking note of the economic profiles of the social groups in Dar es Salaam.<sup>95</sup> In other words, the *bauordnung* was accommodative, both socially and economically. Thirdly, as the historical urban planning scholar J M Kironde and the British intelligence report of 1916 illustrate, the Germans did not create a spatial demarcation line between residential areas until a consideration was made on paper in 1914.<sup>96</sup> The residential separation along racial lines in Dar es Salaam was thus fluid and largely in-existent during the German colonial period. This contrasts German colonial rule with British colonial rule which came to create buffer zones between racial groups.<sup>97</sup>

Finally, the zonal system had been introduced in German cities like Cologne in the 1870s – roughly two decades before the colonial project had begun. The zonal system separated residential, commercial and government areas on the basis of colour, building material and design.<sup>98</sup> Historians like James Brennan and social scientists like Sarah Smiley have persistently argued that the German authorities practised outright racial segregation in Dar es Salaam and, therefore, failed to attribute this functional zonal system to planning developments which had occurred earlier in Germany.<sup>99</sup> Lussuga Kironde also acknowledged that most of the features of the *bauordnung* were “fashionable in Europe at the time.”<sup>100</sup> As such, Kironde, Brennan and Smiley subscribe to the

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<sup>94</sup> As seen in the original plans and reproductions preserved in the British National Archives, Weston Bodleian Library, and the Bundesarchiv.

<sup>95</sup> Kironde, “Land Use Structure of Dar es Salaam”, 130.

<sup>96</sup> Kironde, “Land Use Structure of Dar es Salaam”; United Kingdom, *German East Africa*.

<sup>97</sup> John Iliffe, “The Age of Improvement and Differentiation (1907-45)” in *A History of Tanzania* edited by I.N. Kimambo and A.J. Temu (Nairobi: EAPH, 1969), 123-160, here at 144.

<sup>98</sup> William Harbutt Dawson, *Municipal Life and Government in Germany* (London: Longmans, Green & Co., 1914) 142; T.C. Horsfall, *The Improvement of Dwellings and Surroundings of the People: The Example of Germany* (Manchester: University Press, 1904), 146.

<sup>99</sup> Sarah L. Smiley, “Heterogeneous Water Provision in Dar es Salaam: The Role of Networked Infrastructures and Alternative Systems in Informal Areas”, *Environment and Planning E: Nature and Space* 3, no. 4 (2020): 1215-1231, here at 1218; Jochen Monstadt and Sophie Schramm, “Toward the Networked City? Translating Technological Ideals and Planning Models in Water and Sanitation Systems in Dar es Salaam”, *International Journal of Urban and Regional Research* 41, no.1 (2017): 104-125; Shahadat Hossain, Wolfgang Scholz & Sabine Baumgart, “Translation of Urban Planning Models: Planning Principles, Procedural Elements and Institutional Settings”, *Habitat International* 48 (2015): 140-148, here at 142.

<sup>100</sup> Kironde, “Land Use Structure”, 131.

fallacy of generalisation by failing to see the unique Dar es Salaam context as opposed to other German colonies. In refuting that generalisation, one might ask further questions. For instance, why do they assert that the Germans established “a *cordon sanitaire* between the African and European quarters to limit the range of disease vectors,” while no archival record or physical features from the German colonial era prove that?<sup>101</sup> Why don't they compare the German metropolitan and colonial building codes? Or why do the scholars demonstrate unwillingness to study the colonial-metropolitan circulation of ideas, knowledge and practices? Why do they treat German and British colonial planning models as equal in relation to Dar es Salaam against the historical evidence available? If the Africans in colonial Dar es Salaam were able to differentiate German from British colonial practices, why are contemporary scholars not able to do so as well?<sup>102</sup> Is the factual amnesia accidental or purposeful? Perhaps, these questions are seeking to reveal the magnitude of segregation narrative in a context which has seen a transition from one colonial power to another.

Apart from the accommodative nature of the *bauordnung*, other historians have identified further evidence that indicates that the Germans in Dar es Salaam were largely non-racist in practice unlike in other contemporary colonial capitals. A famous German historian on Africa, Andreas Eckert, has demonstrated that the Germans were very racist in the spatial planning of the Cameroonian city of Douala.<sup>103</sup> On the other hand, Philip Curtin argues that unlike the German colonial cities of Douala in Cameroon, Lome in Togo and Windhoek in Namibia, the medical personnel in Dar es Salaam administered the prophylactic malaria medicine to people from all racial groups from 1900 until 1910 when it became too costly for the colonial state to maintain it.<sup>104</sup> This could be interpreted as a pragmatic medical socialism as there was no racial segregation in the provision of the medicine. However, this should not mean that there was no class treatment in the general public health system. Class treatment was a universal thing in the past and in the present even in the so-called socialist countries. Kironde also indicates that the debate over racial segregation started in the end of 1910s. It was initiated not by the government but by the German merchants who wanted to rival the Indians over monopoly of the market of urban Africans who

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<sup>101</sup> Monstadt and Schramm, “Networked City?”, 112.

<sup>102</sup> Schnee, *Deutsche-Ostafrika*.

<sup>103</sup> Andreas Eckert, “Koloniale Stadtplanung und europäischer Rassismus. Die Enteignung der Duala,” in Winfried Wagner et al eds., *Rassendiskriminierung, Kolonialpolitik und ethnisch-nationale Identität* (Münster & Hamburg: LIT, 1992), 206-216; *idem*, “Unordnung’ in den Städten. Stadtplanung, Urbanisierung und koloniale Politik in Afrika,” *Periplus. Jahrbuch für außereuropäische Geschichte* 6 (1996), 1-20.

<sup>104</sup> Curtin, “Medical Knowledge and Urban Planning,” 607; Manuela Bauche, *Medizin und Herrschaft: Malariabekämpfung in Kamerun, Ostafrika und Ostfriesland (1890-1919)* (Frankfurt and New York: Campus Verlag, 2017), 8. Bauche adds (88) that in Cameroon's Douala, the Africans were resettled away from their native areas and away from the European areas because of anti-malaria programmes.

“were mixed up with Indians” residentially.<sup>105</sup> The government had succumbed to the merchant quest in theory. However, until 1918 when German colonial rule ended, this policy had never been implemented. Historians Ulrike and Jürgen Becher have also argued convincingly that Dar es Salaam was less strictly segregated racially during the German rule.<sup>106</sup> Finally, the British sanitary reports and others cited earlier indicate that it was the British who planned and legislated for residential separation along racial lines (see Figure 3.5 below). Hence, one cannot treat German spatial zoning in Dar es Salaam in the same manner as that of the French and British, who were from the very beginning of their colonial regimes, racist.<sup>107</sup>

Circulating modernity and adapting to local conditions, as was the case in German Dar es Salaam, serves to show that colonial projects were not always rigid. It critiques James C Scott’s *Seeing like a State*, which posits that high modernist ideals tended to fail for lack of flexibility when applied in different contexts other than areas of origin. This critique has been justified by the findings of a historian of technology, Suzanne Moon, who examined how circulated high modernist large-scale projects in colonial Indonesia succeeded after they were appropriated and adapted to the socio-economic conditions of the native Indonesians.<sup>108</sup> Thus, the pre-1914 *bauordnung* had ensured that buildings in the city had certain uniformity, depending on the zone in which they were. When the British started expanding the city boundaries from the early 1930s onwards,<sup>109</sup> the German configuration was changed in keeping with the blatant racial segregation policy. This settlement pattern has been a staple in the segregation narrative that invariably treats the German and British colonial patterns as an undifferentiated whole, something that this chapter attempts to challenge.

The British zoned Dar es Salaam into three residential sectors along racial lines during the interwar period. The zones were Zone I, Zone II and Zone III. Separated by a neutral zone, popularly known as the *cordon sanitaire*, each residential zone would be inhabited by one race. Zone I was for people of European descent; Zone II was for people of Asian descent, who are referred to in the colonial records as Indians, especially in the period before the breakup of India and Pakistan, and<sup>110</sup> Zone III was for people of African descent, who are referred to in the records as

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<sup>105</sup> Kironde, “Land Use Structure of Dar es Salaam”, 132; A historian Manuela Bauche writes that the Indians of Tanganyika were at some point considered as natives. See Bauche, *Medizin und Herrschaft*, 72-73.

<sup>106</sup> Ulrike Lindner, “Wissen-Kontakt-Transfer: Koloniale Stadtplanung am Beispiel Dar-es-Salaam/Deutsch-Ostafrika,” in *Kunstchronik* 74 (2021), 381-390; Becher, *Dar es Salaam, Tanga und Tabora*.

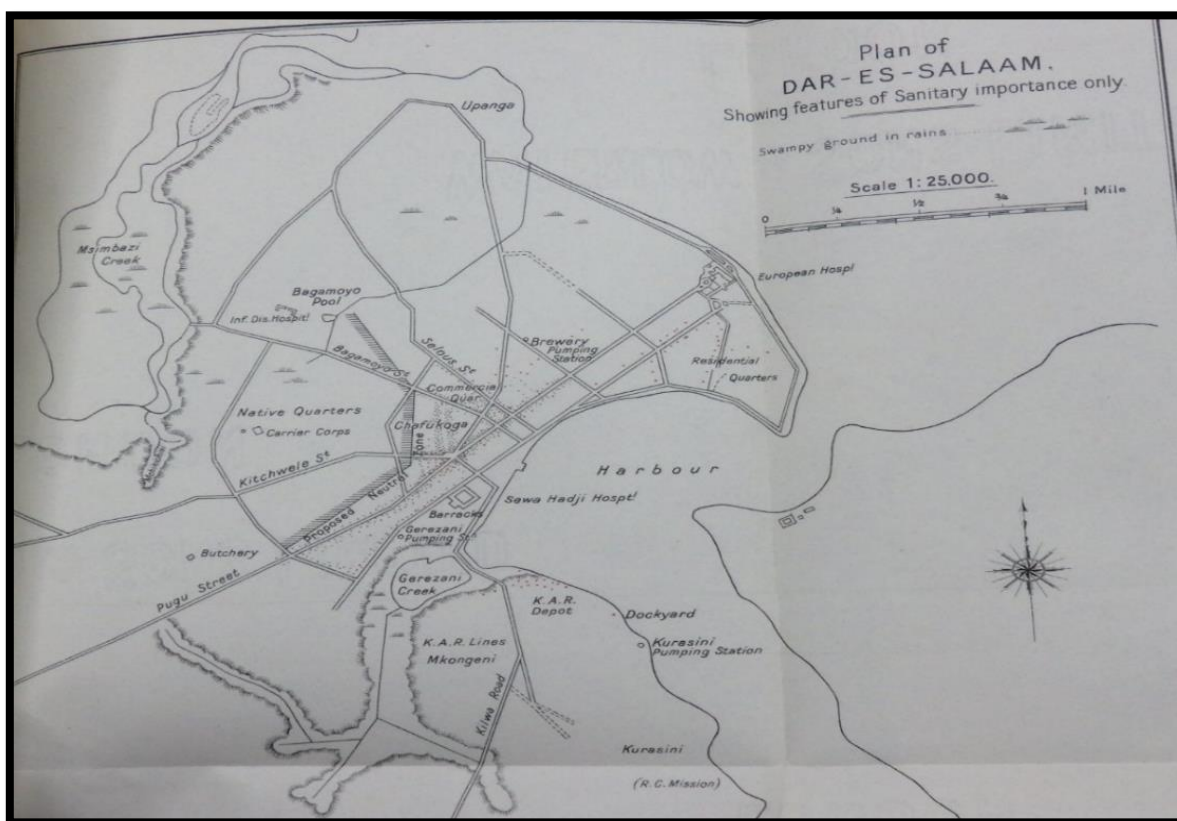
<sup>107</sup> Ambe J. Njoh, *Planning Power: Town Planning and Social Control in Colonial Africa* (London: Taylor & Francis, 2007), 54.

<sup>108</sup> Suzanne M. Moon, *Technology and Ethical Idealism: A History of Development in the Netherlands East Indies* (Leiden: CNWS, 2007).

<sup>109</sup> TNA 61/403/Vol.I: Township Boundaries – D’Salaam Extension of, 1931-1939.

<sup>110</sup> Eva Kjellberg, “The Ismailis in Tanzania”, Institute of Public Administration, University College – Dar es Salaam, *Mimeo.*, 1965-9?

natives. In their endeavour to argue that it was the Germans who created this racially-based residential zoning, Hossain, Scholz and Baumgart erroneously contend that “the settlements for Africans in African-style huts were situated outside these 46 lots and separated from the European settlements by Arabs’ farmhouses.”<sup>111</sup> They also suggest that the building codes were also introduced towards the end of German colonial rule. However, the British intelligence report of 1916 provides evidence that is counter to Hossain’s contention (see Figure 3.3). It shows that the African areas were within the 46 blocks surveyed and planned by the German city authority in Dar es Salaam.<sup>112</sup> The intelligence was probably the first to use the phrase ‘native quarter’, a quintessential term in British colonial semantics, a term that was blindly adopted by one of the earliest historians of Dar es Salaam – David H Anthony III – in his description of German spatial arrangements.<sup>113</sup>



**Figure 3.5:** Proposal for the Neutral Zone in Dar es Salaam  
**Source:** *Tanganyika, Annual Report: Sanitation Branch of the Medical Dept 1921*

<sup>111</sup> Hossain, Scholz and Baumgart, “Translation of Urban Planning”, 142.

<sup>112</sup> United Kingdom, *German East Africa*.

<sup>113</sup> David Henry Anthony III, “Culture and Society in a Town in Transition: A People’s History of Dar es Salaam, 1865-1939” (PhD Diss., University of Wisconsin-Madison, 1983).

The second counter-evidence comes from the original master plan of Dar es Salaam of 1892/1893 which was prepared by the Germans. The plan indicates all 46 plots. To be precise, the master plan shows that block numbers 23, 24, 27, 28, 37, 38, 39, 40, 41, 42, 43, 44 and 45 were largely inhabited by Africans (see Figure 3.6).<sup>114</sup> The 1892 master plan and the British intelligence report thus show the same thing: African residential areas were planned and were within the 46 originally planned blocks. Thirdly, when the British introduced racial zoning, they evicted Africans from the 46 blocks and relocated them to a newly surveyed area of Kariakoo. This was mentioned in the annual reports of the Tanganyika Department of Lands between 1923 and 1933.<sup>115</sup> The roads which separated streets in Kariakoo were curved in 1924 under the supervision of the Medical Department.<sup>116</sup> The fourth piece of evidence comes from the British colonial officials of the Eastern Province of Tanganyika in their administrative correspondences about the origins of boundary descriptions as they were contemplating extending Dar es Salaam in 1931. They noted that:

The German Ordinance itself does not give a description in words of the boundaries of the Zones. The description in words of the boundaries of the Zones, given at page 242 of Vol. III of the Laws of Tanganyika, does not therefore appear to have been taken from the German Ordinance. How such description was arrived at could probably be ascertained from the present Government files dealing with the Building Regulations in question.<sup>117</sup>

The final piece of evidence comes from the photographic material curated at the city museum of Dar es Salaam at Old Boma, whose provenance is from the Northwestern University in the United States and Bundesarchiv in Germany. Mostly taken between 1900 and 1916, the photographs reveal that the Asian and African buildings and streets looked the same. They also display streets like Kisutu which were inhabited by Asians and Africans, but during the British times the streets were exclusively occupied by Asian. If all these primary sources reveal that Africans were not segregated in the German planned urban land blocks, which source do social scientists use when they make bold but factually wrong statements about outright racism? Well, the answer lies in the fact national developments and events in the German East Africa reveal that the Germans were racist. One event was the Maji Maji War in which the Germans were racially brutal. Also, correspondences between metropolitan government in Berlin and colonial state in German East Africa shows that there was racist perspective over the colony and its subjects. This work argues that what happened nationally differed significantly with what happened in urban Dar es Salaam. One has to consider

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<sup>114</sup> See Deutsche-Ostafrika, *Uebersichtskarte von der Stadt Dar-es-Salâm und deren nächster Umgebung* retrieved from Weston Bodleian Library RBMSS E11:25.

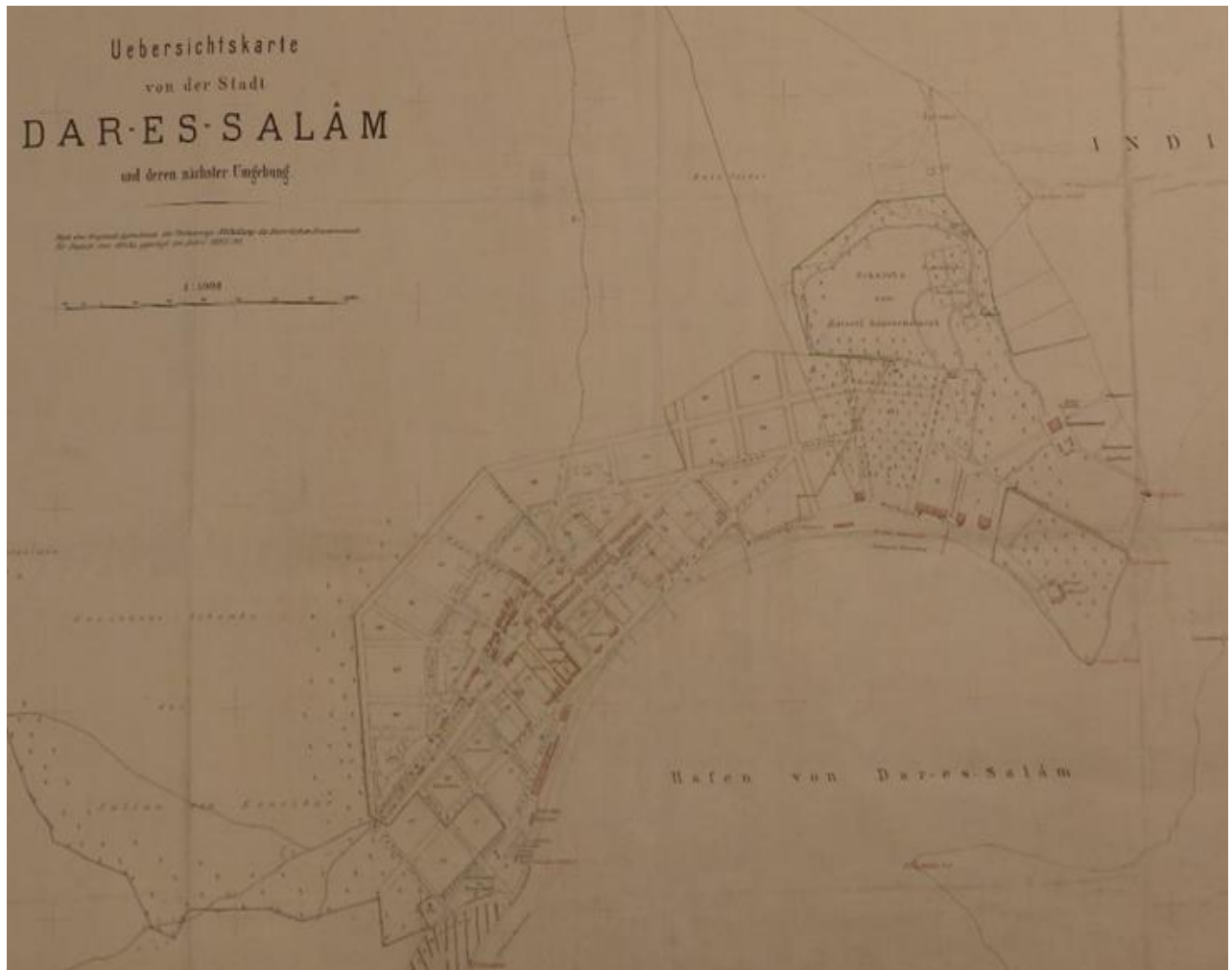
<sup>115</sup> See for instance in Tanganyika Territory, *Annual Report of the Department of Land, Survey and Mines for the Year 1923* (Dar es Salaam: The Government Printer, 1924), 4.

<sup>116</sup> Tanganyika Territory, *Annual Medical and Sanitary Services Department, 1924* (London: The Crown Agents, 1925), 140.

<sup>117</sup> Letter from Keeper of German Records to Provincial Commissioner dated 08.06.1931 in TNA 61/403 Vol.I: Township Boundaries – Dar es Salaam Extension of.



that that African population in Dar es Salaam was cosmopolitan and friendlier to the Germans than other German colonial capitals of Windhoek, Lome and Douala. As such, historians and social scientists have generalised national racism to local contexts of Dar es Salaam, a generalisation which this work seeks to distance itself.



**Figure 3.6:** The First Master Plan of Dar es Salaam Showing the 46 Planned Blocks  
*Source:* RBMSS, Weston Bodleian Library, Oxford University.

Spatial planning along racial lines was a dominant feature of Dar es Salaam during the interwar and post-war periods. The British used cultural preservation and medical arguments to rationalise their practice. They created the *cordon sanitaire* between the African and Asian areas for instance, but they did not set aside recreational spaces in the African areas.<sup>118</sup> In the end, Dar es Salaam landscape was marked of by what the geographer Sarah L Smiley calls ‘three colours’: European, Asian and

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<sup>118</sup> Tanganyika Territory, *Annual Medical and Sanitary Services Department, 1929* (Dar es Salaam: The Government Printer, 1930), 49.

African colours. The historian John Iliffe stressed in the 1960s that such landscape became a visibly spatial feature in the 1930s.<sup>119</sup> This confirms that the spatial and racial policies had materialised within the first decade of British rule in Dar es Salaam. In the pro-African media and local discourse, the areas were known as *Uzunguni*, *Uhindini* and *Uswabilini*. In the post-colonial era, the European areas became the residences of the top African bureaucrats and foreign expatriates. The Asian areas remained Asian, and so were the African areas. Independence replaced the powerful British legacy of racialised geography with socio-economic categories. This does not mean that there was completely no change in the post-colonial era. The new areas which were planned became areas of the middle class and better infrastructure than the unplanned areas. In the popular discourse, two labels emerged: *Uswabilini* for the poor and the unplanned areas and *Ushuani* for the middle class and the planned areas. The British racial zoning, therefore, led not only to geographical and social distinctions but also to economic and infrastructural distinctions, which have persisted till today. Differences in infrastructure are discussed below.

### 3.2.2 *British Spatial Zoning and Its Imprint in the Provision of Infrastructure*

Racism in the provision of infrastructure in British Dar es Salaam was not an accidental development. As lessons from colonial India and Britain itself reveal, the British empire was hierarchical in social structure. Phillip Curtin once argued that racialised provision of infrastructural services in Africa was an extension of the colonial cultures from India.<sup>120</sup> Studying British society itself as uncovered by Selina Todd, one learns that the British people are classy, both historically and culturally.<sup>121</sup> As such, it is correct to argue that the British imperial and colonial cultures pre-meditated the advent of infrastructural splintering urbanism in all British cities in the Global South. Recent imperial historians agree with this argument, saying that “imperial and colonial cultures and institutions constantly played upon each other.”<sup>122</sup> In this section, I portray how cultural tendencies of infrastructure provision developed in Dar es Salaam; and how such development led to the splintered infrastructure instead of a ubiquitous and networked infrastructure provision that was already common in the cities of the Global North.

The unequal provision of infrastructure in the interwar period was made possible by the town administrative structure. John Iliffe argues that Dar es Salaam “had no adequate administration. It was governed by a Municipal Secretary concerned primarily with the commercial

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<sup>119</sup> Iliffe, “The Age of Improvement and Differentiation,” 144.

<sup>120</sup> Curtin, “Medical Knowledge and Urban Planning.”

<sup>121</sup> On class nature of British society see in Selina Todd, *The People: The Rise and Fall of the Working Class* (London: John Murray, 2015).

<sup>122</sup> Porter, “Britain and The Empire in the Nineteenth Century”, 1.

zone.”<sup>123</sup> The networked ideal of providing infrastructure equally and to all urban residents and areas was unattainable. The municipal administration, headed by Europeans, considered itself responsible for providing infrastructure in Zone I and Zone II. Like the colonial officials in Kampala, the colonial officials in Dar es Salaam posited that it was “necessary to provide for covered drains only in the bazaar area and in the roads connecting the pier to the centre of the town, for it is in these roads alone that the user would seem to justify this expense.”<sup>124</sup> In 1929, the Medical Department noted in its annual report that “a piped supply of good water is provided in each house in the residential area, to a considerable number in the commercial zone, and to a few stand-pipes in the native town.”<sup>125</sup> The British were unwittingly admitting that the networked infrastructure was being offered along racial lines, too. The European and Asian areas which in the report were referred to as residential and commercial zones were connected to the typical networked water system in which every house had access to a public water network. The African housing units did not have such access. The natives purchased or fetched water from a single point in a street as the medieval and early modern Europeans used to do. Public water kiosks and mobile water venders – popularly known as *wazegazega* – were a common feature in Zone III in 1920 and the 1930s,<sup>126</sup> but non-existent in Zone I or Zone II. The same thing was common in the other British colonies of Singapore, India, Sri Lanka and Hong Kong, where “the targets of water reform were chiefly identified by race rather than class.”<sup>127</sup> Hugh Dixon, a civil engineer who had been invited to assess the development of Dar es Salaam drainage in the early 1950s, was peeved by such racialised water provision and argued that “water consumption is a function of the standard of living and not race.”<sup>128</sup>

There were strong concerns among the colonial officials about improving drainage in Dar es Salaam between 1924 and 1929. In 1925, for instance, the concern was for ‘proper’ sewerage to be provided in only the European and Asian zones.<sup>129</sup> The study and planning for the building of permanent drainage was undertaken in 1931. The study recommended the implementation of combined drainage plans for Zones I and II. A few selected areas of Zone III were to be installed with open storm water drainage to control floods and malaria. The plans for sewerage and

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<sup>123</sup> Iliffe, “The Age of Improvement and Differentiation (1907-45)”, 145.

<sup>124</sup> Letter from Howard Humphreys & Sons to the Chief Secretary dated 09.10.1930 in BNA CO 536/182/18: Drainage Development Schemes: Sewerage and Storm Water of Kampala and Jinja

<sup>125</sup> Tanganyika Territory, *Annual Report of the Medical and Sanitary Services Department, 1929* (Dar es Salaam: The Government Printer, 1930), 49.

<sup>126</sup> Letter Director, Medical Dept. to Senior Health Officer dated 23.09.1933 from in TNA 61/622: Public Bathing Places

<sup>127</sup> Broich, “Engineering the Empire”.

<sup>128</sup> Dixon, “The Main Drainage of Dar es Salaam”, 100.

<sup>129</sup> Tanganyika Territory, *Annual Report of the Medical and Sanitary Services Department, 1925* (Dar es Salaam: The Government Printer, 1926), 31.

stormwater drainage were drawn by Messrs Howard Humphreys & Sons firm, which the government dubbed “a firm with world-wide experience of this kind of problem” because it had implemented sanitation and water projects in most of the British colonies.<sup>130</sup> Humphreys’ dominance within the British empire signals that the engineering knowledge and materiality on drainage matters was circulating a single engineering style, something that is discussed in detail in Chapter VI. It also tells us about the connections they had with the key Crown Agents officials who were responsible for identifying consulting engineers in the United Kingdom for colonial public works.<sup>131</sup> In the late 1920s and early 1930s when the Consulting Engineers for Tanganyika were consulted, the Crown Agents were four and all were knighted. They were Hugh C Thornton, Percy H Ezekiel, Lt Col James Carmichael and Henry Lambert.<sup>132</sup> Such connections have been discussed in detail in Casper Andersen’s *British Engineers and Africa, 1870-1914*.

Covering Oyster Bay, Sea View, the commercial zone, the government streets and some native areas, “the cost of the full scheme was estimated at £360,000 of which £201,660 was the sewerage scheme and the balance for a stormwater drainage scheme.”<sup>133</sup> The reason the native areas were included in the storm water scheme is that they were low lying and were frequently flooded “sometimes to a depth of several feet during the rainy season.”<sup>134</sup> The European and Asian areas, which had the lion share of scheme’s funding despite being smaller areas, were included in the scheme to improve the future health of the city.<sup>135</sup> In a short report on housing conditions in Zone II published towards the end of the Second World War, for instance, it was argued that the rapid increase in the number of the Asians from India called for immediate sewerage improvement because “an outbreak of a serious epidemic disease (such as Plague) would give rise to grave danger to the population.”<sup>136</sup> In 1921, colonial reports categorised Indians as ‘poor Whites’ group because it had either low or “no sanitary standard at all; it has no knowledge of the causation or means of

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<sup>130</sup> Tanganyika Territory, *Report of the Central Development Committee* (Dar es Salaam: The Government Printer, 1940), 160 in BNA, CO 691/179/15: Development of Tanganyika – Report of Central Development Committee; Howard Humphreys had many projects in the British Empire such as in Uganda, Sierra Leone and British Guiana. See for instance in BNA, CO 536/182/18: Drainage Development Schemes: Sewerage and Storm Water of Kampala and Jinja.

<sup>131</sup> In a letter from Governor Donald Cameron to the Secretary of State for Colonies Lord Passfield dated 27.02.1930, the governor requested the London government to ask the Crown Agents “to approach a suitable firm of Consulting Engineers and arrange for an Engineer to be sent” to Tanganyika for planning the sewerage scheme of Dar es Salaam which had been communicated in earlier correspondences between London and Dar es Salaam. See in BNA, CO 691/107/9: Sewerage Scheme.

<sup>132</sup> See in David Sunderland, *Managing British Colonial and Post-Colonial Development: The Crown Agents, 1914-1974* (Suffolk: The Boydell Press, 2007), 254.

<sup>133</sup> Tanganyika, *Central Development Committee*, 158.

<sup>134</sup> Tanganyika, *Central Development Committee*, 158.

<sup>135</sup> Tanganyika, *Central Development Committee*, 160.

<sup>136</sup> TNA, 61/4/15: Housing in Zone 2 – Dar es Salaam Township.

prevention of disease.”<sup>137</sup> The District Officer of Dar es Salaam in 1929 reported that the Indian section of the township had “conditions under which people live, Asiatics chiefly, are often thoroughly insanitary.”<sup>138</sup> However, the fear of eruption of epidemics in the Asian areas was not an isolated or localised trepidation. The Colonial Office in London understood its gravity in all the colonial cities and towns. In 1934, for instance, it was noted that “Kampala, like other towns in East Africa, has ... in the middle an Indian bazaar which, as usual with Indian bazaars, has become a regular plague spot” unlike the natives who were understood as having “a high regard for sanitary administration and a confidence in modern methods of checking the spread of disease”.<sup>139</sup> “They [the Indians] are regarded by white community as an unhealthy, dangerous growth,”<sup>140</sup> wrote one Briton. The London and Dar es Salaam governments, as well as the whites in the colonial towns and cities developed this covert official lampoon over Indians. As archival records show, the medical concerns were, thus, at the heart of the calls to improve the storm-water drainage and sewerage of Dar es Salaam between 1918 and 1945.

The scheme was not implemented in the 1930s because Britain and Tanganyika were experiencing a shortage of funds as a result of the great economic depression. The Deputy Governor of Tanganyika told to the Secretary for Colonies in 1934 that his government had shelved the project since “the time was not considered suitable for the inauguration of the schemes involving heavy capital expenditure.”<sup>141</sup> The scheme was on shelves until in the 1950s when it was slightly revised and executed. The shelving of the scheme showed weaknesses in the British colonial development in the interwar period as it was one of the external manifestations of the global economic recession. Had flooding not been recurring, the native areas would not have been included in the scheme. The exclusion of Africans from infrastructural service provision was, thus, not only in the networked infrastructure ideal, but it was done through separate infrastructural designs as was shown in the comprehensive drainage plan for Dar es Salaam. One would say that splintered urbanism caused duality in the provision of infrastructure in two distinct qualities, two dissimilar designs and two different kinds of spatial coverage.

The roads in Zone III were dirty roads with no additional layers of gravel or tarmac to consolidate them. Such roads had either dirty drains or no drain ditches at all. Africans were not

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<sup>137</sup> Tanganyika Territory, *Annual Report of Sanitation Branch of the Medical Department, 1921* in BNA, CO 736: Tanganyika Territory – Administration Reports.

<sup>138</sup> TNA Open Accession, Annual Report for the Year 1929 for Dar es Salaam District.

<sup>139</sup> Memo from J.E.W. Flood to Dr. O’Brien dated 29.10.1934 in BNA, CO 536/182/18: Drainage Development Schemes: Sewerage and Storm Water of Kampala and Jinja

<sup>140</sup> Joelson, *Tanganyika Territory*.

<sup>141</sup> Letter from Sir P. Mitchell to Sir Philip Cunliffe-Lister dated 26.09.1934 in BNA, CO 691/140/13: Sewerage Schemes; see also letter from Sir D.J. Janzine to Sir Philip Cunliffe-Lister dated 17.08.1932 in BNA, CO 691/125/11: Sewerage Scheme – Dar es Salaam.

happy with the state of the roads and demanded improvements that were never made.<sup>142</sup> In 1945, for instance, the Provincial Commissioner for Eastern Province in Tanganyika noted that “dissatisfaction has frequently been voiced at the housing shortage, bad roads, inadequate street lighting, insufficient police protection and the paucity of medical services in Zone III . . . but little practical improvement has been effected.”<sup>143</sup> Unlike in other British colonies such as Nigeria, where Africans used pressure groups like the Motor Transport Union to ask for improvement of the state of roads and whose demand was granted immediately by the Public Works Department of Nigeria in 1938,<sup>144</sup> in Dar es Salaam the roads in the African areas remained in poor state throughout the colonial period because of the absence of such powerful pressure groups. On the contrary, only few streets in Zone I, especially the two streets along the road to the city centre, had been macadamized and had ditches surfaced with concrete in the pre-WWII era.

Solid refuse was also frequently collected in Zones I and II, while in Zone III it was not.<sup>145</sup> In the interwar period, the dump was on the “outskirts of native town.”<sup>146</sup> There were street lights in the Asian and European areas and the police force demanded that they “be kept burning throughout the night” to increase security. On the contrary, the African zones either lacked or had very few street lights found in only important points like market centres and busy junctions.<sup>147</sup> These conditions remained unchanged throughout the British colonial period. As such, it is rational to argue that the practices that qualify the recent ‘people as infrastructure’ thesis by Abdoulmalik Simone<sup>148</sup> were already firmly established during the colonial period. The manifestations of this thesis in the post-colonial cities uncovers the colonial continuity, instead of change. Each zone had its own infrastructural set-up and house designs. As the literature on technology shows, the provision of differential infrastructural services in urban areas creates splintered urbanity.<sup>149</sup> The networked infrastructure ideal of ubiquitous and unified technical systems was not introduced into African areas during the British colonial period by default. Racism, cultural paternalism and

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<sup>142</sup> *Kvetu*, 14.01.1938.

<sup>143</sup> Tanganyika Territory, *Annual Reports of the Provincial Commissioners for the Year 1945* (Dar es Salaam: The Government Printer, 1946), 31.

<sup>144</sup> Letter dated 26.08.1937 from Deputy Governor of Nigeria to Secretary of State for the Colonies stated that the Public Works Department “made in the Estimates for 1937-38 for extending the tarring of roads”. See in BNA, CO 583/222/12: Lagos Municipal Area: Improvement of Roads & Drains and the Extension of Markets.

<sup>145</sup> Letter dated 20.08.1927 from District Commissioner, Dar es Salaam to Provincial Commissioner, Eastern Province, in TNA, 61/247/1: Sanitation – Dar es Salaam.

<sup>146</sup> Tanganyika Territory, *Annual Report of Medical Department for 1923* (London: The Crown Agents, 1924), 55.

<sup>147</sup> TNA, 61/615: Township Lighting 1928-1944.

<sup>148</sup> Abdoulmalik Simone, “People as Infrastructure: Intersecting Fragments in Johannesburg” in *Public Culture* 16(3) (2004), 407-429.

<sup>149</sup> Stephen Graham and Simon Marvin, *Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition* (London: Routledge, 2001).

financial shortages were the key reasons that the British administrators used to rationalise the provision of splintered infrastructural services at the expense of Africans.

### 3.3 The Bearing of Anti-Malarial Engineering on Drainage and Traffic Infrastructure

#### 3.3.1 Drainage Structures and Designs

Prior to 1935, the main highway from Dar es Salaam to the north, west and southwest highlands of Tanganyika was parallel to the railway line. The highway headed to the southwest of the city. However, in 1934 the Public Works Department decided to construct a new, main highway to the west of the city; the highway crossed the Msimbazi Valley. The construction began in 1935.<sup>150</sup> The decision to construct the highway the modern Morogoro Road, had a significant implication for the lower parts of the Msimbazi Valley. In particular, it implied that the valley anti-malarial drainage engineering was now intersecting with the traffic infrastructural engineering. In later years, there were other implications, apart from the technical ones. It created room for the boundary of the city to be expanded towards modern-day Kinondoni and Magomeni neighbourhoods, which was done in the post-war period, as discussed in Chapter II. Since then, the magnitude of perennial flooding has been assessed, at least visually and informally. The media have invariably used photographs of the Msimbazi Valley during the rainy season to show the gravity of flooding and to make the government act. People have also had difficulty in accessing the city centre during floods. Moreover, the anti-malarial drainage projects dominant up to the mid-1930s in the Msimbazi Valley lost their importance during floods. Despite their loss of importance, the anti-malarial drainage structures have come to dominate the future of flood controls not only in valleys but also in the streets of Dar es Salaam City. But why and how did this change from malarial control to flooding control happen?

On 12<sup>th</sup> August 1936, the Director of Medical Services Department wrote a letter to the Chief Secretary of Tanganyika on sewerage and drainage matters in Dar es Salaam. The Director was responding to the measures the Department was taking to address the problem of storm water, or flooding, which had led to the appearance of “so many unfavourable comments in the press.” Apart from stating the general state of the storm-water drainage, the letter acknowledged the existence of “the underground stormwater drainage system in the Acacia Avenue area” which was in poor state owing to disrepair and lack of routine maintenance. A decade later, the *Tanganyika Standard* noted that the system of drainage underground drains was “virtually the system built for the far smaller German town, with few extensions.”<sup>151</sup> In the early 1920s, the Executive Council of

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<sup>150</sup> BNA, CO691/146/1: Tanganyika: Public Works Expenditure.

<sup>151</sup> *Tanganyika Standard*, 12<sup>th</sup> August, 1940.

Tanganyika had also acknowledged that the Germans had built an underground pipe network for sewage and storm water control in the European business street whose waste water was disposed of in the sea.<sup>152</sup> In the literature on drainage and sanitation, such a network is known as the combined drainage system.<sup>153</sup> The business street, known as Barra Rasta Strasse at the time, was equipped with combined drainage because it was heavily-built and probably for technological representation purposes in an important commercial street of the city and the territory. The combined drainage was known as the underground sewers in North American cities, where they were installed earlier than in European cities. The sewers were “intended mainly for storm water, to prevent flooding and accumulation of ‘miasma’ breeding puddles of stagnant water.”<sup>154</sup> In the second half of 19<sup>th</sup> century, however, the function changed after it was realised that cholera was a waterborne disease which could be controlled by draining wastewater from households through the combined drainage, an understanding that had begun in European cities, especially in Paris and London, following scientific discoveries, sanitary movements, and most importantly, the great stinks of streets and rivers.<sup>155</sup>

The Germans also built dirty roads with convex shapes and some roads were built with open but parallel gutters to direct storm water to the nearby port. In some literature on sanitation, these drains are known as surface drains.<sup>156</sup> Surface drains are part of separate sewerage systems because they help “overcome the problems of dilution of sewage and fluctuations in the flow to the treatment plant due to climatic conditions.”<sup>157</sup> In Europe and North America, surface drains were commonly used to direct both sewage and storm water to the immediate rivers and seas from roughly about the 1790s to about 1890s.<sup>158</sup> “New York City’s first sewers”, for instance, “were simply gutter drains made of wood, then stone and later of brick.”<sup>159</sup> This was also the case for Kampala City in Uganda during the 1920s when territory was under British colonial rule.<sup>160</sup> The

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<sup>152</sup> Tanganyika Territory, Administration Reports for 1924 in BNA, CO 736/13: Tanganyika – Executive Council Minutes.

<sup>153</sup> Hans Buitert, “Constructing Dutch Streets: A Melting Pot of European Technologies” in *Urban Machinery: Inside Modern European Cities* edited by Mikael Hård and Thomas J. Misa (Cambridge: The MIT Press, 2008), 141-162, here 150.

<sup>154</sup> Joel A. Tarr, “The City and Technology” in *A Companion to American Technology* edited by Carroll Pursell (Oxford: Blackwell Publishing, 2008), 97-112, here at 100.

<sup>155</sup> Stephen Halliday, *The Great Stink of London: Sir Joseph Bazalgette and the Cleansing of the Victorian Metropolis* (Gloucestershire: The History Press, 2013)

<sup>156</sup> David Butler and John W. Davies, *Urban Drainage* (London: E and F.N. Spon, 1998), 6.

<sup>157</sup> N.F. Gray, *Water Technology: An Introduction for Environmental Scientists and Engineers* (London & New York: IWA Publishing, 2010), 411.

<sup>158</sup> Halliday, *The Great Stink of London*, 54; for American cities see in Tarr, “City and Technology”, 100 and in Carroll Pursell, *The Machine in America* (Baltimore: The Johns Hopkins University Press, 2007), 144-146;

<sup>159</sup> Harry Granick, *Underneath New York*. With an Introduction by Robert E. Sullivan Jr. (New York: Fordham University Press, 1991), 40.

<sup>160</sup> Letter from Howard Humphreys & Sons to Chief Secretary of Uganda Protectorate dated 02.04.1930 in BNA, CO 536/182/18: Drainage Development Schemes: Sewerage and Storm Water of Kampala and Jinja



two technical functions – removal of sewage and storm water – coalesced into the control of flood waters. In the literature on sanitation and drainage engineering, surface drains are called ditches, gutters and channels.<sup>161</sup> Their design is “mostly open drains, lined or unlined, running adjacent to roads.”<sup>162</sup> To be unlined means they are dirty channels, drains that are just dug and then left without further building. The lined channels are drains that have been dug and have been surfaced with layers of slabs or are consolidated with concrete. Unlike lined channels, unlined ones are prone to erosion during the rainy season. The disadvantage of unlined drains is that they need frequent repairs and maintenance to remove silt or to increase depth. The advantage of unlined drains lies in the fact that a significant amount of water may be absorbed by the surface before being going to the treatment plant or the disposal area. Thus, they reduce the volume of storm water in the final points. In the 1920s Dar es Salaam, the British called for immediate installation of surface drains “simply lined with a thin sand and lime mixture, or some similar facing of low cost” in order to control flooding in the African streets.<sup>163</sup> Surface drains exist as part of the combined or separated drainage systems. They are found in both the Global North and Global South nations.

In the construction of traffic infrastructure, surface drains were known for their efficiency in protecting roads from erosion. The historian R J Forbes has identified the British roads engineer Thomas Hughes as the first to suggest the digging of channels parallel to roads under construction so that the drainage of roads could be improved. This idea was introduced in 1838 in England.<sup>164</sup> Since then, most of the roads built in urban areas have been equipped with surface drains to protect them from water erosion, to control flooding and, therefore, to increase the resilience and durability of the roads. They exist in different designs, which have been innovated over time to adapt them to the local climatic conditions. Other designs have been made a routine engineering culture in certain places owing to path dependence as was the case with the former British colonies like Tanganyika. The inclusion of surface drains in traffic infrastructure has led to a certain level of technological interdependence being developed. It is now hard to design road projects without including some form of surface drainage. During the German colonial period, surface drains were used to remove water from streets during the rainy season. In the main streets of Kaiser Strasse and Wissmann Strasse, the drains were lined. Storm water was disposed of in the sea. During the

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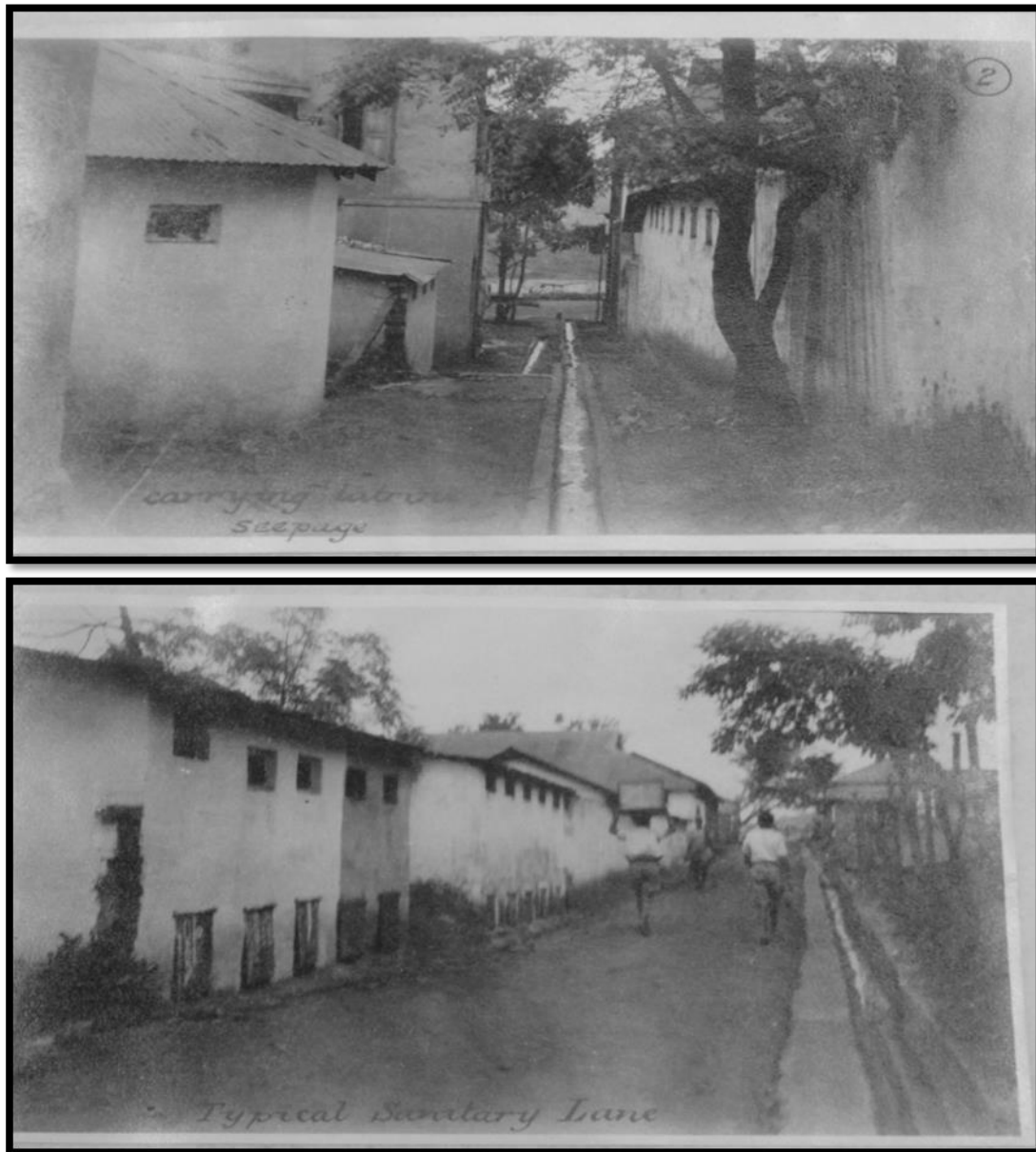
<sup>161</sup> See in Olumuyiwa Bayode Adegun, “Coping with Stormwater in Johannesburg, South Africa Informal Settlement”, *Municipal Engineer* 167, no. ME2 (June 2014), 89-98; Brian Reed, “Storm-water Management in Low-Income Countries”, *Municipal Engineer* 166, no. ME2 (June 2013), 111-120.

<sup>162</sup> Reed, “Storm-water Management”, 112.

<sup>163</sup> Letter from Health Officer of Dar es Salaam to Provincial Commissioner dated 01.11.1927 in TNA, 61/247/1: Sanitation – Dar es Salaam.

<sup>164</sup> R J Forbes, “Roads to c. 1900” in *A History of Technology: The Industrial Revolution c. 1750 to c.1850* edited by Charles Singer et al. (Oxford: Oxford University Press, 1958), 520-547, here at 536.

British colonial period, the drains were the key drainage infrastructure that enjoyed frequent repair and maintenance.<sup>165</sup>



**Figure 3.7:** Open Surface Drains in Kampala in 1930

**Source:** BNA, CO532/182/18: *Drainage Development Schemes – Kampala and Jinja.*

Apart from the ditches, traffic engineering had additional drainage improvement technologies some of which were also known before the 19<sup>th</sup> century. The technologies predated both the modern underground and surface drainage structures. In the renaissance and late enlightenment Europe, there was interest in the classical documents on road building. This interest emerged in the quest to respond to the growing volume of trade that passed overland. The vehicles that travelled on roads used animal power included coaches, chares and chariots. As such,

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<sup>165</sup> Edward and Hård, “Maintaining the Local Empire”.

improving the drainage of roads was technically important. Italians improved road drainage by raising the road level above the surface soil and by using stones, sand, mortar and cobble layers. Before the 18<sup>th</sup> century, road engineering was the province of military engineers.<sup>166</sup> Roads were understood as the key infrastructure of war. No serious training was offered for non-military engineers. As a matter of fact, C L Howard Humphreys, the founder of Messrs Howard Humphreys & Sons civil engineering firm and designer of drainage systems in the East African colonial capitals, was formerly a military engineer who left the British army as a lieutenant colonel.<sup>167</sup> France is well respected for being the first country to establish training institutes for traffic engineering. The institutes – known as *École* – were established by royal decrees to train the building supervisors and road engineers. The first training institute was decreed in 1747 and was called the *École des Ponts et Chaussées* in Paris. The then famous road builder, Jean Perronet, became the first director of the institute.<sup>168</sup>

Other European nations which lagged behind, excluding Britain, began established serious centres and institutes to train traffic engineers towards the end of first half of the 19<sup>th</sup> century.<sup>169</sup> The French trained who were in the road institutes are credited for introducing trench-digging in road building roads in the late 18<sup>th</sup> century. Trenches were carefully rammed with successive layers of stones, bigger and smaller stones, in order to improve durability. For the purpose of improving drainage, the roads had 18-inch layer width at the middle and 12-inch width on the sides, thus creating a convex cross-section. Storm water would thus be pushed out of the road through the convex gradient. The French traffic engineering influenced the famous British engineers in the 19<sup>th</sup> century, namely Thomas Telford and John McAdam, who spread the technology within Britain.<sup>170</sup> A biographer of Telford, Julian Glover, has described him romantically as a *Man of Iron* whose road building “method produced a road which was designed to mature and to last,” and who “drew on both his own experience as a stonemason and on work done in France by the pioneering roadbuilder Pierre-Marie-Jérôme Trésaguet.”<sup>171</sup> Telford’s and McAdam’s apprentices circulated the road building methods in the British Empire. In Tanganyika, for instance, it was such civil engineers as Sir Alexander Gibb, the great-grandson of Telford’s assistant, John Gibb, who spread the

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<sup>166</sup> John Weiler, “Colonial Connections: Royal Engineers and Building Technology Transfer in the Nineteenth Century” in *Construction History* 12 (1996), 3-4.

<sup>167</sup> Dixon, “The Main Drainage of Dar es Salaam”, 97.

<sup>168</sup> Forbes, “Roads to c. 1900”, 523.

<sup>169</sup> For Germany see in Kees Gispens, *New Profession Old Order: Engineers and German Society, 1815-1914* (Cambridge: Cambridge University Press, 1989).

<sup>170</sup> Forbes, “Roads to c. 1900”, 527-531.

<sup>171</sup> Julian Glover, *Man of Iron: Thomas Telford and the Building of Britain* (London: Bloomsbury, 2016), 198.

method in the 1940s and 1950s.<sup>172</sup> It was Sir Gibb who drew the first comprehensive master plan for Dar es Salaam during the British colonial era in 1949.<sup>173</sup> Another was Howard Humphreys, who acknowledged in the 1932 report on the main drainage of Dar es Salaam that “the three main principles of road construction” which “are drainage, foundation and surface.” He added that most of the roads in Dar es Salaam lacked surface drains, which “has been the cause of unfavourable comment in the past.” He also noted that “it is most uneconomic to continue the reconstruction of important roads without paying attention” to drainage first.<sup>174</sup> In practice, however, most of the roads built from 1932 to 1960 had either no or poor drainage.

Separate drainage systems are not preferred in many nations in the Global North because they are expensive to build and need a bigger space in which to install two separate wastewater systems. They involve building an underground piped network for on sewage and building a separate piped or surface drainage for storm water. Climatic conditions of the Global North provide good reasons for installing a combined drainage system, instead of a separate drainage system. When building the combined drainage system for London, Sir Joseph Bazalgette distasted the separate system because it would take the builders a long time to install a proper wastewater system in the capital of the empire.<sup>175</sup> In colonial Uganda, however, the British engineers under the advice of the renowned consulting engineer company, Howard Humphreys, preferred a separate drainage system for Kampala. Part of the advisory was included in the letter to the Chief Secretary of Uganda Protectorate on 2<sup>nd</sup> April 1930, which read in part:

In designing any system of sewers for a tropical city subject to intense downfalls of rain, it is necessary to exclude storm water and to deal with it by an entirely separate system of drains. This can easily be arranged and we have done so in the case of Kampala. The sewers, therefore, designed to deal with foul liquids alone. Storm water drainage will form the subject of a separate report. Were storm water not excluded from the sewers, the sizes of pipes required would be so large that the system would be financially impracticable. Whereas open drains are best for storm water drainage they are impracticable for sewage.<sup>176</sup>

The adoption of separate or combined drainage systems has further implications, which are historical. The Germans introduced municipal socialism in Dar es Salaam, which continued to exist in the British colonial period and in the post-colonial era. Municipal socialism refers to the use of public money to provide infrastructural services for the good of the public. Although the concept has been subject to divergent scholarly and ideological debates on the socialist and

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<sup>172</sup> Glover, *Man of Iron*, 249; Example of Gibbs’ road building works in Tanganyika was stated in *Report to the General Assembly of the United Nations on the Administration of Tanganyika for the Year 1947* (London: His Majesty’s Stationery Office, 1948), 43.

<sup>173</sup> Further details on the works of Sir Alexander Gibb in Tanganyika are described in Chapter IV of this work.

<sup>174</sup> TNA 450/649/1: Drainage Ordinance

<sup>175</sup> Halliday, *The Great Stink of London*.

<sup>176</sup> Letter from Howard Humphreys to Chief Secretary dated 02.04.1930 in BNA, CO 536/182/18.

capitalist urban governance, those involved in the debates agree that municipal socialism embodies “collective provision” of “things like drains, utilities, markets, pavements, garbage collection, etc.”<sup>177</sup> It comes with legal restrictions on individual change, building, repair and maintenance of infrastructure used or understood as belonging to the whole public. Building regulations and rules are good examples of such restrictions. Since the infrastructure is built with public money it is supposed to be provided uniformly in terms of design or quality or both in all the urban areas under certain municipal jurisdictions. As such, municipal socialism has made many Global North cities in the world adopt networked infrastructure systems by default.<sup>178</sup> The conception of modern urban infrastructure as a networked system is closely associated with studies by the French scholar Gabriel Dupuy. According to Dupuy, the networked planning and engineering of modern infrastructure began in some European cities in the mid-19<sup>th</sup> century and later circulated elsewhere.<sup>179</sup>

Some of the areas where the networked infrastructure ideal was circulated were the colonial towns and cities like Dar es Salaam and Tanga in Tanganyika. Spatial planning made room for their circulation by providing grounds for their introduction in the towns and cities. However, traffic infrastructure is probably the only infrastructure that became fully networked by linking all urban areas during the colonial era. Drainage, water and power infrastructure developed a duality or heterogeneity because of limited funds or because of the intentional unwillingness to spread such networks to all areas because of racial or other cultural-political factors. With respect to the drainage system, for instance, there was a small network of underground piped combined drainage network in a few streets in Zone I during the interwar period. The network was extended to Zone II in the post-war period. Some streets in the same zones had also been equipped with surface drainage, both lined and unlined. There was, thus, some form of network duality in the two zones. In Zone III there were either a few surface drains, which were never lined, or no drains at all. In October 1938, for instance, the Medical Officer noted that many streets in Zone III needed “water-proofing” surface drainage as the sandy ones could be damaged easily.<sup>180</sup> To the dismay of the Medical Officer of Dar es Salaam, nothing was done by the Municipal Authority.<sup>181</sup> Furthermore,

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<sup>177</sup> Jon G. Davies, “From Municipal Socialism to . . . Municipal Capitalism?”, *Local Government Studies* 14, no. 2 (1988): 19-22.

<sup>178</sup> See for instance in G. Flamingo, “Municipal Socialism in Europe”, in *Journal of Political Economy* 6 (1898): 396-401; Gustav Cohn, “Municipal Socialism”, *The Economic Journal* 20, no. 80 (Dec. 1910): 561-568.

<sup>179</sup> Gabriel Dupuy, *Urban Networks: Network Urbanism* compiled and edited by Jeroen van Schaick and Ina T. Klaasen. (Delft: Techne Press, 2008), 19-37.

<sup>180</sup> Letter from Medical Officer of Health to the Municipal Secretary, Dar es Salaam dated 15.09.1938 in TNA, 450/649/1: Drainage Ordinance.

<sup>181</sup> Letter from Medical Officer of Health to the Director of Medical Services dated 13.05.1940 in TNA 450/649/1: Drainage Ordinance.

the surface and underground drains were not connected at all. As a result, the drainage of Dar es Salaam did not have a unified network. It assumed the shape of bits and sections of drains, here and there, a splintered drainage system. It was chaotic and heterogenous infrastructure unbundling, which has existed to the present. Recent studies in social sciences have posited the failure to implement the networked infrastructure ideal in Dar es Salaam in particular and in the Global South in general as being caused by “patterns of rapid urbanization.”<sup>182</sup> However, this caricature is partially tenable only in the present. In the colonial days, the population and cities were very small. It was not implemented because of colonial government’s unwillingness to spread the networks equitably and accordingly, which ultimately led to what Prince K Guma calls the ‘state of translation incompleteness’.<sup>183</sup>

### 3.3.2 From Anti-Malarial Drainage to Urban Traffic and Flood Drainage: The American Factor

If the sanitary movement and engineering in the Global North was a riposte to the cholera epidemics and great stinks, the sanitary movement and engineering in the Global South was a response to the malarial and yellow fever endemics and epidemics. As such, the discourse on sanitation in the 19<sup>th</sup> and 20<sup>th</sup> centuries was about control of waterborne diseases by either preventing contamination of clean water from sewage waste or by preventing the development of breeding places for mosquitoes. The actors in sanitation understood that controlling wastewater would reduce the spread and impact of waterborne diseases. The context and the resultant designs of sanitary or drainage structures, however, differed, depending on the nature of the dreaded disease. In the Global North, the context was a free world in which cholera was ravaging the cities and capitals of the colonial empires. The intervention needed political, medical, social and technological solutions. Politicians discussed and approved the budgets for implementing drainage schemes. Medical personnel like Dr John Snow, and later Robert Koch, discovered the association between water contamination and cholera.<sup>184</sup> Civil engineers built the sewerage drainage and treatment or dump so that the water supply could not be contaminated.<sup>185</sup> The anti-cholera engineering structures became the piped and combined underground sewerage networks. The structures became the standard drainage designs in the Global North cities as well as in the Global South centres that had large numbers of people from the Global North. Some of such Global

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<sup>182</sup> Monstadt and Schramm, “Toward the Networked City?”; Cf. Smiley, “Heterogenous Water Provision in Dar es Salaam”.

<sup>183</sup> Prince K. Guma, “Incompleteness of Urban Infrastructures in Transition: Scenarios from the Mobile Age in Nairobi”, *Social Studies of Science* 50, no. 5 (2020), 728-750.

<sup>184</sup> Amanda J. Thomas, *Cholera: The Victorian Plague* (Barnsley: Pen and Sword, 2015), 161-2, 191; Richard J. Evans, *Death in Hamburg: Society and Politics in the Cholera Years 1830-1910* (New York: Penguin, 1988), 265-72.

<sup>185</sup> Thomas, *Cholera*, 166; Halliday, *The Great Stink of London*.

South cities were the colonial capitals. They became one of the modernity representations of technological materialities or one of the material cultures of the industrial civilisation.

In most of the Global South locations, colonial and neo-colonial control was widespread. Malaria and yellow fever were causing a heavy death toll, especially to the key actors in the political superstructure who originated from the Global North. This has been documented well in J R McNeill's *Mosquito Empires* and in William C Gorgas' *Sanitation in Panama*. In West Africa, malaria, among other reasons, prompted the British to establish indirect rule because it was claiming the lives of so many British administrators that West Africa was dubbed 'the White Man's Grave'.<sup>186</sup> In German East Africa, later Tanganyika, the morbidity rate caused by malaria between 1921 and 1930 was as high as 36%, and in the mortality rate malaria accounted for 21.5%.<sup>187</sup> These figures show the number of the European and Asiatic officials affected by malaria in Dar es Salaam. The Africans were not counted, since they were not attended in the European and Asiatic hospitals. In the 1890s, the Germans had established a medical research centre at Amani in Tanga with a huge malarial bias.<sup>188</sup> The British maintained the centre and its research bias, and in the early 1930s they established the second centre in Dar es Salaam. They also passed *the Mosquito Extermination Ordinance of 1935* and started the use of what they called 'propaganda' in which "timely notices were published in the local Press drawing attention in non-medical terms to the factors concerned in the spread of malaria, and detailing the prophylactic measures."<sup>189</sup> In particular, the British used pamphlets and posters published in Kiswahili and native languages to disseminate anti-malarial knowledge. One pamphlet was known as "Mafundisho".<sup>190</sup> When some Africans had attained Western education, the health propaganda that relied on written media is less likely to have achieved the anticipated outcome. By its design, the propaganda was elitist, which explains why anti-malarial programmes proliferated after the post-war era.

The Germans were extremely troubled by malaria. For instance, the mortality rate of malaria between 1904 and 1912 stood at 0.66 % for the Europeans. Therefore, in 1912 they felt compelled to hire an experienced American medical doctor to advise on proper methods of controlling the disease.<sup>191</sup> It was Dr Alexander J Orenstein. Orenstein had worked as the right lieutenant of William C Gorgas, the famous American military doctor and an extremely important

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<sup>186</sup> M H Y Kaniki, "The Colonial Economy: The Former British Zones" in *Africa under Colonial Domination 1880-1935* edited by A. Adu Boahen (California: Heinemann, 1985), 390.

<sup>187</sup> BNA, CO 691/147/8: Tanganyika: Malaria Research Schemes.

<sup>188</sup> Geissler et al., "Amani".

<sup>189</sup> R. Mackay, *Second (Final) Report of the Malaria Unit, Dar es Salaam, for the Period November 1934 to December 1936* (Dar es Salaam: The Government Printer, 1938), 32; TNA, 23027: Extermination of Mosquitoes Ordinance, 1935.

<sup>190</sup> Tanganyika Territory, *Annual Medical and Sanitary Services Report for the Year 1933* (Dar es Salaam: The Government Printer, 1934).

<sup>191</sup> Mackay, *Report of Malaria Unit*, 8.

person in ending the dread of yellow fever and malaria in Cuba, Panama and the Caribbean.<sup>192</sup> Gorgas' work in Cuba and Panama was part of the broader preventive medicine, a dominant form of medicine at a time when curative medicine was yet to be introduced and infectious diseases were looming large. It was the time when medical doctors helped design civil engineering solutions for medical problems. Gorgas and Mr Joseph L Le Prince, a civil engineer to the British or the building inspector to the Americans, developed engineering designs to control the development of breeding places for mosquitoes.<sup>193</sup> They targeted the vector population.

The first design was an open surface drain. The drain was first dug in a V- or U-shape. Then, it was lined with concrete and oriented to a gradual gradient. The concrete was good because it "entirely prevented the growth of grass and did away with the expense of upkeep." It also reduced breeding places on the surface because it drained water efficiently. Unlined drains proved to be inefficient and uneconomical to maintain as they were prone to erosion and silt accumulation, offered an ideal surface for the growth of grass and a good breeding environment for mosquitoes as they could easily develop into small ponds and resist good flow of water. The second design involved filling excavated ditches with broken stones. This design allowed water to pass below the stones and prevented the growth of grass. There were also non-engineering solutions, especially the oiling of ponds, swamps and other kinds of moving and stagnant water containing fresh water. Oiling of stagnant water bodies used kerosene to kill the mosquito larvae or burn grass that grew on the sides of ditches.<sup>194</sup> The latter solutions were applied in areas which were a bit far from congested residential areas because those were excellent areas for the reproduction of mosquitoes that carry the germs of malaria or yellow fever. With high operation costs and the growing apprehension about their environmental consequences, especially from the 1950s onwards, such non-engineering solutions were dropped in favour of drainage designs.

On arrival in Dar es Salaam, Orenstein advised the Germans to adopt the same methods that had been applied in Panama and Cuba. He had noted that the Germans had constructed a few ditches in the city. He had noted that the Chafukoga area was inundated with water during the rainy season and that an intervention was needed to "keep the water out of the houses at all times" like building "a sewer of sufficient capacity". Swamps and creeks also needed "drainage . . . by the use of sub-soil and open concrete-lined drainage." He also suggested filling and clearing vegetation

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<sup>192</sup> Randall M. Packard, "The Invention of the 'Tropical Worker': Medical Research and the Quest for Central African Labor on the South African Gold Mines, 1903-36", *The Journal of African History* 34, no. 2 (1993): 271-292, here at 280; Rochelle Keene, "Alexander Jeremiah Orenstein (26 September 1879, Odessa, Russia – 7 July 1972, Johannesburg)", *Occupational Health Southern Africa* 26, no. 2 (2020): 93-94.

<sup>193</sup> Gorgas, *Sanitation in Panama*.

<sup>194</sup> Gorgas, *Sanitation in Panama*.



ponds, including the Karavanserai and golf course ponds. Furthermore, he suggested oiling of ponds and creeks. And finally, he suggested that all houses, especially European houses, should have window mosquito screens. To succeed in combating malaria with these measures, the health officer had to lead an inspection committee to the streets, just as had been done in Havana and Panama.<sup>195</sup> Orenstein gave these suggestions after reading the report of Dr Manteufel, the medical officer of Dar es Salaam, which revealed that incidents of malaria were very high in the city, despite the decade-long (1901-1910) provision of quinine prophylaxis to the denizens. As noted by the historian Philip Curtin, the prophylactic malarial medicine was administered by Dr Heinrich Ollwig, an apprentice of Robert Koch, to all people regardless of their race.<sup>196</sup> Probably, out of attending upper social class needs, part of the golf course pond was filled as Orenstein was writing the final report to control malaria. The Governor of German East Africa had objected to Orenstein's suggestion of installing a sewer rather than on open drainage in the Chafukoga area. This made Orenstein elaborate on how scientific the suggestion was in the final report to *Gesundheit Kommission* – the Health Committee.<sup>197</sup> With the First World War (WWI) looming large, Orenstein's recommendations were not executed.

With malaria still a huge threat even to the new colonial masters of Dar es Salaam – the British – after WWI, Orenstein's report was re-read with urgency. The British learnt of the malaria dread soon after capturing the city. In 1917, for instance, a military medical officer, Captain Pomeroy, reported that 70% of “the troops were down with malaria.”<sup>198</sup> The early civil officials contemplated installing a combined sewerage system at the core of the city, taking inspirations from towns like Rangoon, Rio de Janeiro, Southampton and Cape Town. The aim was to do away with the cesspits, found in all the former German zones: residential, government and commercial zones. The cesspits were considered as endangering the water supply because of their copiousness and closeness to wells. “This proximity,” the Medical Officer wrote, “is not only to be found in the Native quarter: the German European officials were far from ensuring that their cesspools were placed as the necessary distance from their wells.” Indeed, the cesspits were the dominant sanitation infrastructure in the pre-war and interwar Dar es Salaam. To the medical officer, it was “a matter

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<sup>195</sup> All these have been taken from a report of Dr A J Orenstein which was translated by the British in 1919. See in TNA, 450/39/10: Report by Dr A J Orenstein to the Imperial Governor of German East Africa, 1913. On importance of sanitary inspection in Cuba and Panama during the works of anti-malarial see Robert Patterson, “Dr. William Gorgas and His War with the Mosquito”, *CMAJ* 141 (1989): 596-599, here on 596.

<sup>196</sup> Philip D. Curtin, “Medical Knowledge and Urban Planning in Tropical Africa”, *The American Historical Review* 90, no. 3 (1985): 594-613, here in 607.

<sup>197</sup> TNA, 450/39/10: Report by Dr A.J. Orenstein to the Imperial Governor of German East Africa, 1913. Italics are mine for emphasis.

<sup>198</sup> Tanganyika Territory, *Annual Reports of Principal Medical Officer and the Senior Sanitary Officer for 1918-1920* in BNA, CO 736: Tanganyika Territory – Administration Reports.

of wonder that epidemics of intestinal disease were not of frequent occurrence in German times, or even during the war, with large numbers of Indian troops and followers who were brought into the country.”<sup>199</sup> Orenstein had also provided some details of the water supply and suggested what to do to improve the quality of water, given the proximity of the cesspits. The cesspits were also considered to be causing wetness in the city, ideal breeding places for mosquitoes.

The British treated Orenstein’s report with great importance because it offered them some light on drainage matters and plans at a time when there were shortages of maps of the city or records of the previous works. They knew he had been employed by the American government and had been an assistant of “Surgeon-General Gorgas during the construction of Panama Canal.” They concluded that “his opinion, therefore, is of weight.”<sup>200</sup> Orenstein’s background and experience in Dar es Salaam were not the only factors that emboldened the British. Local conditions made his report an inevitable knowledge reference. Most of the open drains had been buried by the rainy in the four years of inactivity or had been damaged during WWI. The transition from military to civil rule had also caused the loss of valuable information on city governance, since it had caused fruitless disputes between military and civil medical officers. Thus, the period between 1918 and 1925 was dominated by infrastructure restoration and repair, or had “been largely taken up by spade work, ‘getting things going’ in other words.”<sup>201</sup> Most of such activities have been documented by Edward and Hård in their work on repair and maintenance research in Dar es Salaam.<sup>202</sup> Apart from restoring and repairing infrastructure, the British landmark construction projects were the anti-malarial drains in the creeks bordering the city centre. The building of drains followed the ‘manual’ provided by Orenstein.

Because of inadequate funds for spraying the ponds and creeks with kerosene fuel, and because DDT had not yet been developed, the British focused on digging drains in certain streets to prevent the stagnation of storm water in the 1920s.<sup>203</sup> In the Gerezani and Msimbazi creeks, they could not build drains: but they filled parts of the creeks and improved the flow of water by removing pools of stagnant water. The hurdle in such works during the 1920s was the frequently reported “lack of funds”.<sup>204</sup> Furthermore, drainage works (all sanitary, anti-malarial and storm water drains) in the interwar and during the war period could not be provided with funds neither from

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<sup>199</sup> All quotes taken from TNA, 450/39/10: Summary of Report on New Works required in Daressalaam, 30 September 1919.

<sup>200</sup> Tanganyika, *Annual Reports of Principal Medical Officer*.

<sup>201</sup> Tanganyika, *Annual Reports of Principal Medical Officer*.

<sup>202</sup> Edward and Hård, “Maintaining the Local Empire”.

<sup>203</sup> Experimental spraying of DDT in Dar es Salaam was discussed and launched in late 1940s. See BNA, CO 927/140/7: East Africa – Application of Insecticides from the Air to Control Anopheline Mosquitoes on Swamp Breeding Grounds in Dar es Salaam; Tanganyika Territory, *Annual Report of Medical Department for 1948* (Dar es Salaam: The Government Printer, 1949).

<sup>204</sup> See for instance in Tanganyika, *Annual Report of Sanitation Branch, 1921*.

the central colonial government nor from the native authorities (which later came to be part of local government). They received funds from extraordinary votes or from the London government through the Colonial Development Fund (CDF) grants and loans. Even when CDF grants and loans were provided, they were little. The outcome could not have been tremendous. Most of the drains, whether in the streets or creeks, were not lined with concrete, making them prone to erosion by storm water and disappearance after a short time. They would, thus, require emergency funds to repair or re-dig. Despite these setbacks, the malarial mortality and morbidity rates declined significantly. The decline made the colonial actors continue with their course of action.

To the relief of local colonial actors, there were some improvements in the CDF funds for building anti-malarial drainage in Dar es Salaam in the 1930s. In 1936, for instance, the CDF disbursed about £ 27,000 for anti-malarial works for the Gerezani, Kivukoni, Kurasini and golf course areas.<sup>205</sup> Lasting for a duration of four years, the works led to the improvement of the drainage of the creeks through the construction of concrete-lined drains, as shown in Figure 3.11 below. The mortality and morbidity rates caused by malaria also fell sharply. If “the medical conquest of yellow fever and malaria made the engineering feat (the Panama Canal) possible”, the combined medical and engineering solutions against malaria made the colonisation of Dar es Salaam a less exacting task.<sup>206</sup> While in the creeks there were significant improvements in drainage to control mosquito breeding, in the streets the situation was still far better, particularly in the African areas. Flooding and the erosion of storm-water drains led to the making of persistent “calls for provision of new drains as soon as possible.”<sup>207</sup>

Orenstein’s footprint did not end only in the set of combined medical and engineering solutions. It also impacted on the organisational structure of the Medical and Sanitary Services Department. This was because of the sheer dominance of medical personnel in Dar es Salaam’s and Tanganyika’s civil administration. In Dar es Salaam, the senior medical officer served as the executive officer in the 1920s, and from the 1930s onwards, as the municipal secretary of the township administration.<sup>208</sup> They supervised the day-to-day activities of municipal governance and public works, thus making them the most resourceful officials in the colonial administration. They gave orders to the engineers, made decisions on spatial planning and determined the final medical policies. This exceptional place of the medical officers was replicated in the administration of the

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<sup>205</sup> Tanganyika Territory, *Annual Report of the Medical and Sanitary Services Department for 1936* (Dar es Salaam: The Government Printer, 1937).

<sup>206</sup> Amos Christie, “Medical Conquest of the ‘Big Ditch’”, *Southern Medical Journal* 71, no. 6 (1978): 717-723, here at 718.

<sup>207</sup> Tanganyika, *Annual Report of the Medical and Sanitary 1936*.

<sup>208</sup> See for instance in annual reports of the Medical and Sanitary Services Department for 1929 and 1931.

territory. At territorial level, the Director of Medical and Sanitary Services Department was the third most powerful person in the territory after the Governor and Chief Secretary. He acted as a governor during most of the executive meetings.<sup>209</sup> This special place of the medical officers, empowered by Orenstein's advice, led to the introduction of a new type of engineer – the sanitary engineer.

The sanitary engineer found only in Dar es Salaam worked under the Medical and Sanitary Services Department in executing engineering projects related to medical issues. Orenstein's suggestion on the recruitment of this type of engineer given to the British drew inspiration from the organisational structure of the Cuban and Panama anti-malarial and yellow fever committee. Led by a medical doctor, Dr Gorgas, the committee had a standby team of civil engineers led by Joseph Le Prince, who was not allowed to do non-medical building works.<sup>210</sup> The sanitary engineer, who in the 1930s was known as the malarial engineer, existed in the Medical Department for two decades. He was responsible for building and maintaining storm water drains and sewage drains, and building and improving drainage in the swamps and creeks. The Medical Department noted that sanitary engineer's arrival was expected to greatly reduce the "annual cost of maintenance and repair" by developing a permanent surface drainage.<sup>211</sup> He did these tasks under the senior medical officer or the Director of Medical Services. In 1932, for instance, the anti-malarial engineer of Dar es Salaam was William Millar. Millar developed the drainage plans for controlling floods in the golf course.<sup>212</sup> However, funds were not forthcoming for building anti-flood cum anti-malarial drains for the golf course despite being a recreational area for the senior colonial officials. Two years later, "unusually heavy rains caused the flooding of the golf links for six weeks and the malaria rate for the township was considerably higher than that of 1933."<sup>213</sup> Fearing for the worst, the colonial officials applied immediately for the CDF funds, which were disbursed in 1936 as pointed out above. The imperial government disbursed the funds promptly against all the odds of the 'hungry thirties' because it was alarmed by the abrupt rise of malarial cases after a decade of a sizeable decline. Inaction would have meant depriving the limited European colonial manpower of their health and recreational facility – the golf course – which in the end would have affected the colonial grip over Tanganyika.

The position of sanitary engineer did not exist in the Medical and Sanitary Services Department after 1940. Two things may account for its acrimonious end. Firstly, there was

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<sup>209</sup> See in BNA, CO 736/13: Tanganyika: Executive Council Minutes, 1920-1934.

<sup>210</sup> Gorgas, *Sanitation in Panama*.

<sup>211</sup> Tanganyika Territory, *Annual Report of the Medical Department for 1925* (Dar es Salaam: the Government Printer, 1926), 32.

<sup>212</sup> BNA, CO 691/125/11: Tanganyika: Sewerage Scheme – Dar es Salaam – Loan Allocation

<sup>213</sup> Tanganyika Territory, *Annual Report of the Medical and Sanitary Services Department for 1934* (Dar es Salaam: the Government Printer, 1936), 33.

objection from the Public Works Department (PWD), especially after the latter's reorganisation in 1937. The reorganisation of the PWD was partly an endeavour to assert the department's monopoly and independence over engineering works and professionals. They were not happy to receive orders from the Medical Department, especially on details of drainage design. They also wanted to put an end to the two-decade reduced role as repairers and maintainers of the technological systems built by either the Germans or the British Medical Department.<sup>214</sup> When the position was created in the early 1920s on Orenstein's advice, the British colonial authority felt unease to employing normal civil engineers to the work.<sup>215</sup> It sought to employ a typical sanitary engineer, comparable to Mr Le Prince, who had worked under Gorgas. During the anti-malarial engineering works in Panama, Mr Le Prince was not allowed to work in the ongoing construction of the Panama Canal – a civil engineering project commissioned by his employer, the United States government. He worked under the Surgeon General, Dr Gorgas. The British sought to emulate the US organisational structure and thought that there was a unique type of civil engineers trained in matters of medical importance in America.

However, when the first and subsequent recruitments were made to fill the position, the Governor of Tanganyika, Sir Donald Cameron argued against recruiting Americans. They wanted to hire a British civil engineer with experience in executing sanitation projects in the Global South. They wanted to appropriate the technology of building sanitary drains, which had circulated from Americans. They hired a Briton, Mr G Atkinson in 1925 but in 1926 he proved inefficient and was sacked. When an American applied for the job with recommendation from Orenstein, the Governor wrote to London on the need to employ normal civil engineers who would work under the PWD. While they succeeded in wading off the Americans, they did not succeed in hiring a sanitary engineer without the influence of the Medical Department. This means that the position was contested not only along nationality grounds but also along professional lines.

Secondly, the British ended the position in the 1940s as they were reducing the cost of administration because most of its manpower were directed to serve in the frontline or in other tasks related to the Second World War (WWII).<sup>216</sup> The Medical Department was depleted to the extent that even the annual reports for 1942, 1943 and 1944 were not produced. The anti-malarial works were also put on shelves until after WWII. By virtue of circumstances, like failure to use the Governor's power to dislodge the position in the mid-1920s and failure to extricate it even after

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<sup>214</sup> Edward and Hård, "Maintaining the Local Empire", 35.

<sup>215</sup> Tanganyika Territory, *Annual Report of the Medical Department for 1923* (London: The Crown Agents for the Colonies, 1924), 43.

<sup>216</sup> See Tanganyika Territory, *Annual Report of the Medical and Sanitary Services Department for 1940* (Dar es Salaam: The Government Printer, 1941). The report was only a 2-page report, shortest ever since the Department's establishment in 1920.

the reorganisation of the PWD in 1938, it is correct to argue that the sanitary or anti-malarial engineer would have continued to exist had it not been the belligerence of WWII. Reports by the Medical Department in the post-war era would have continued showing the activities of anti-malarial engineers with the PWD persistent lamentation on the existence of such engineers. The establishment and bitter end of the sanitary engineer position serves to illustrate how powerful the medical profession was over the engineers in Tanganyika, perhaps more than they were at home, in the United Kingdom. The engineers who built the London and Paris combined drainage systems were not working under the medical professionals. They took orders directly from the local or central governments. Moreover, this technocratic context serves to illustrate how technological circulation can be influenced by politics. Finally, it illustrates how anti-malarial drainage and Global North's antiquated road drainage designs found their place in the Global South.



**Figure 3.8:** Oiling Solutions in Panama  
*Source: W C Gorgas, Sanitation in Panama, 1915.*



**Figure 3.9:** A Flooded Golf Course in the City Centre in Dar es Salaam in 1935  
*Source:* R. Mackay, *Second Report of the Malaria Unit, Dar es Salaam, 1938.*

### 3.4 Conclusion

The period between 1913 and 1945 is a historical moment in which the German technological legacy was appropriated, repaired and maintained, particularly in Dar es Salaam's drainage infrastructure. Technological control shifted hands, from the Germans to the British, because of the global political events connected to the First World War. It is a period in which the drainage infrastructure was regarded as being extremely important in controlling storm water, not because it was causing floods, but because it was perceived as being detrimental to public health. The German colonial actors' initial concern over drainage was to improve road drainage. But from 1913 onwards, their focus was on controlling malaria so that they asked the American engineer to advise them on how to design and manage anti-malarial drainage. When the British took over Dar es Salaam in 1918, they maintained the German drainage approach: they actually made drainage a matter of general health, rather than just controlling a single disease. Malaria, yellow fever, cholera and typhoid were dreaded more than floods. As a result, spatial planning and engineering units had to become sub-units of the Medical Department of Tanganyika. Continuity of the medicalisation of drainage in the two colonial regimes, therefore, laid the foundation of ignoring the impact of flooding on the traffic infrastructure. The road builders justified the significance of drainage on public health grounds, thus subjugating its importance to the roads. The improvement of road

drainage in this period was dependent more on anti-malarial drains or on the convex design of roads than on fundamental road drainage requirement.

The second important issue is how the exclusionary perceptions influenced the drainage planners and colonial officials with respect to the design and distribution of drainage and traffic infrastructure in Dar es Salaam during the British colonial period. Unlike their predecessors, the Germans, the British used explicit laws, policies as well as spatial and infrastructural tools to ensure that drainage and traffic infrastructure were provided unequally in quantitative and qualitative terms along racial lines. They adopted apartheid practices in the provision of infrastructure, which affected the urban Africans. The colonial reports and correspondences cited in this chapter reveal that there was a perception among the British that the Africans in Dar es Salaam could endure inadequate and poor infrastructural services, even if they paid taxes and were treated differently from the Europeans and Asians in the same city. The British, therefore, created a moral, legal and policy foundation of a splintered city, the legacy of which still exists. In particular, by emphasising the provision of surface drainage in the African areas and underground piped drainage in the Asian and European areas in the main drainage plan of 1932, they made the city have two separate drainage systems. The possibility of building a networked city through drainage infrastructure was, thus, pre-empted. The quality of the traffic infrastructure also manifested different investments: some street roads were dirty, while others were macadamised to make them less sandy and weather storm water. Unlike the Germans, the British appropriated the drainage and traffic infrastructure which was splintered because they wanted to exert cultural dominance using the racial factor.



**Figure 3.10:** Gerezani Creek Concrete-Lined Drainage, 1936  
*Source:* R Mackay, *Second Report of the Malaria Unit, Dar es Salaam, 1938.*





## CHAPTER IV

### INFRASTRUCTURE REGIMES IN TRANSITION: GOVERNANCE, PLANS AND MATERIALITIES, 1945-1967

The period between 1945 and 1961 was an era of urban expansion in Dar es Salaam, characterised by unprecedented residential and infrastructural construction. In this chapter, archival and secondary sources are examined to argue that infrastructural networks, especially roads and drainage systems, were developed for all the major racial groups' areas to maintain the unequal character that had begun in the German colonial era. It is substantiated in the subsequent chapter sections that disparities in infrastructural services and materialities were mediated through the realm of cultural bias. Cultural bias was the result of the 19<sup>th</sup> century imperialism, which was orchestrated by the technologically-advantaged Global North. The overtly cultural infrastructural development was facilitated by the changing relationship between Tanganyika and Britain in the post war period – a change that pitched new vigour, vitality and funds for 'progress'.

The progress was split in social, economic and political categories. While this newly ignited progress covered the whole territory, Dar es Salaam was the only township that outshone other Tanganyika towns in governance, housing and infrastructure distribution. Such an eye-catching state was punctuated by its elevation from a township to a municipality and city in 1949 and 1961 respectively, by the first municipal master plan in 1949 and by a series of housing and infrastructure projects between 1947 and 1967. These events and processes were a turning point in the history of Dar es Salaam as a cosmopolitan city, as a capital of Tanganyika, as a site of urban technologies' execution and as a site of clashes between cultures – tradition and modernity, foreign and local. Despite the fact that Tanganyika was granted political independence on 9<sup>th</sup> December 1961, the period between 1961 and 1967 can be described as exhibiting the continuity of the colonial urban governance practices and infrastructural services as there was no other significant changes other than the political one. This explains why this chapter describes both the late colonial and early independent periods.

#### 4.1 Urban Governance

##### 4.1.1: Political Governance Transitions

The period after the Second World War was a turning point in the development of Dar es Salaam. There were qualitative and quantitative changes in housing, infrastructure scale and distribution as well as in the social relations between the different racial groups and in urban governance.

Regarding urban governance, a number of geo-political transitions occurred in the period between 1937 and 1967. The annual provincial reports of the Eastern Province that were submitted to the Governor of Tanganyika show that Dar es Salaam had been a district since the end of the German colonial era. As a district, it had rural and urban areas. During the colonial period, rural and urban concerns were conflictual in that the Africans and colonial officials had different demands. In the annual provincial report of 1945, for instance, it was stated that “dissatisfaction has frequently been voiced at the housing shortage, bad roads, inadequate street lighting, insufficient police protection and the paucity of medical facilities in Zone III.”<sup>1</sup> Zone III was inhabited by Africans in urban Dar es Salaam. It can be noted that the urbanites’ voices were so strong that the colonial administrators had to pay instantaneous and more attention than it was the case for the rural voices within the same district. Some of the colonial officials were critical of this situation. In one case, R S Hickson-Mahony, an acting Provincial Commissioner for Eastern Province, pointed out in 1937 that “much of the time was devoted to urban affairs that the administration of the rural areas suffered”.<sup>2</sup> Consequently, Dar es Salaam was split in two districts in 1938, namely Dar es Salaam and Temeke. The new Dar es Salaam District comprised the urban part of the old Dar es Salaam District, whereas Temeke District largely comprised the rural areas.

Following the Second World War (WWII), Europe was left devastated and the war had certain consequences for the governance of the two districts. For one thing, colonial manpower from Britain was reduced. Furthermore, a number of colonial officials went to fight on different fronts of the war. Additionally, the funds that were previously allocated for colonial development were directed towards financing war-related activities. The shortage of staff and the allocation of duties for war-related activities influenced the coalescence of Dar es Salaam District and Temeke District into one district again. The new district was formed in 1942 and was named Uzaramo District.<sup>3</sup> The new district and its setup continued to exist up to 1950 when manpower and financial conditions improved. Fast population growth can be said to have been another factor that made post-war changes inevitable.

In 1946, a *Municipal Ordinance* was passed by the Legislative Council in order to provide guidelines for establishing municipal governments in Tanganyika.<sup>4</sup> As there was no other township which could also become a municipality in the British colonial period, it is correct to argue that the

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<sup>1</sup> Tanganyika Territory, *Annual Reports of the Provincial Commissioners on Native Administration for the Year 1945* (Dar es Salaam: The Government Printer, 1946), 31.

<sup>2</sup> Tanganyika Territory, *Annual Reports of the Provincial Commissioners on Native Administration for the Year 1937* (Dar es Salaam: The Government Printer, 1938), 15.

<sup>3</sup> Tanganyika Territory, *Annual Reports of the Provincial Commissioners on Native Administration for the Year 1942* (Dar es Salaam: The Government Printer, 1943), 20.

<sup>4</sup> *The Municipalities Ordinance, No. 29 of 1946* in Tanganyika Territory, *Ordinances Enacted during the Year 1946* (Dar es Salaam: The Government Printer, 1947).

ordinance was enacted in order to transform Dar es Salaam from a township into a municipality. On 1<sup>st</sup> January 1949, the Dar es Salaam Municipal Council (DMC) came into full operation. Following the formation of the DMC, the Eastern Province Commissioner formed a committee tasked with making a constitution for the council under Mr O B E Malik, the Dar es Salaam Township chairman.

As the constitution for the DMC was being crafted, Dar es Salaam was in transitional governance for two years. The change from a township to a municipality had a bearing on Dar es Salaam. The immediate impact was the transfer of the headquarters of Uzaramo District from Dar es Salaam to Kisarawe,<sup>5</sup> 30 kilometres west of the modern-day city centre. Kisarawe was made the district sub-headquarters dealing with rural administration of the whole district, whereas Dar es Salaam was the headquarters dealing with urban administration. Up to the end of 1946, Uzaramo District had a population of about 150,000 people.

Another impact of the transition period was the incorporation of African representation in the administration of urban areas in Uzaramo District. Previously, the urban Africans were unrepresented since they were considered temporary residents whose permanent homes were in rural areas, as the Director of Town Planning in Tanganyika, Frank White, conceded in 1958.<sup>6</sup> The village headmen were, therefore, the only African representatives who could express African interests to the Liwali and District Commissioner. A Liwali was usually a Swahili middleman who chaired court cases at lower administrative levels within the district and who administered the headmen under a British District Commissioner (DC). In 1947, Dar es Salaam streets were under 25 street Jumbes. These Jumbes as well as one Liwali, three Wakili, 10 non-official representatives and five DC formed a “trial African representation and advisory board to the District Commissioner and Provincial Commissioner.”<sup>7</sup> The trial representation was part of envisioning prospects and challenges of governance after the formation of the municipality.

The experimental representation ended on the 31<sup>st</sup> December 1948. On the 1<sup>st</sup> January 1949, the Dar es Salaam Township was replaced by Dar es Salaam Municipality. When the municipality was about to be established, the population consisted of about 50000 Africans, 19759 Asians and 2110 Europeans.<sup>8</sup> The change from a township to a municipality was accompanied by

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<sup>5</sup> Tanganyika Territory, *Annual Reports of the Provincial Commissioners on Native Administration for the Year 1946* (Dar es Salaam: The Government Printer, 1947), 18.

<sup>6</sup> Frank Silvester White, “Some Problems of Town Planning for Multi-Racial Communities in Tropical East Africa” in *ICE Proceedings: Conference on Civil Engineering Problems Overseas* (London: ICE, 1958).

<sup>7</sup> Tanganyika Territory, *Annual Reports of the Provincial Commissioners on Native Administration for the Year 1947* (Dar es Salaam: The Government Printer, 1948), 27.

<sup>8</sup> Tanganyika Territory, *Annual Reports of the Provincial Commissioners on Native Administration for the Year 1948* (Dar es Salaam: The Government Printer, 1949), 29.

a change in administrative and representation structures. Despite the fact that Africans were in the majority, they were underrepresented at the beginning of a municipal council. The first council had about fifteen councillors: four Africans, four Asians, one Arab and six Europeans. From 1949 to 1958 – when a deputy mayoral position was ‘given’ to Africans to ease political tensions in Dar es Salaam<sup>9</sup> – the mayoral position was held interchangeably by the Europeans and Asians. “The first Mayor of Dar es Salaam was Councillor Percy Everett.” The Municipal Council attained its own administrative structure, which consisted of a Town Clerk, a Municipal African Affairs Officer, a Municipal Engineer and a Municipal Treasurer.<sup>10</sup>

These changes went hand in hand with national administrative changes, including constitutional and institutional reforms. The reforms were made under an order from the United Nations which sought to expedite the transition from colonial to Tanganyika self-rule. The United Nations insisted on increasing African representation and considering African concerns. However, the colonial administrators in Dar es Salaam and elsewhere in Tanganyika did not heed the advice, but acted in disguise instead. Some admitted in various reports that they were not doing due diligence on attending to African affairs more than they did for the other racial groups.

In 1945, for instance, the Eastern Province Commissioner conceded that he “regretted that little or no advance has been made during the year towards the erection of a model block of houses in the African town, nor has it been possible to give African welfare the constructive attentions which it so urgently needs.”<sup>11</sup> Similarly, the Eastern Province Commissioner, S.A. Walden, insinuated in 1952 that Asian concerns were attended at the expense of Africans when he said, “the African housing problem remains as acute as ever and more and more I am convinced that when we talk of an African housing problem we really mean the Asian expansion into African areas.”<sup>12</sup>

As part of the above administrative changes, Uzaramo District was renamed and split several times between 1949 and 1959. In 1949 the district was renamed Kisarawe. In July 1950, Kisarawe District was split in two districts, namely Dar es Salaam and Kisarawe, a decision that is said to have been rejoiced and “welcomed by the Africans in the town.” Additionally, the government enacted the Local Government Law of 1953 in order to encourage the development of district and town councils with elected members from all races, according to the wishes of the

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<sup>9</sup> Tanganyika Territory, *Annual Reports of the Provincial Commissioners on Native Administration for the Year 1958* (Dar es Salaam: The Government Printer, 1959), 20.

<sup>10</sup> Tanganyika, *Annual Reports of the Provincial Commissioners on Native Administration for the Year 1949* (Dar es Salaam: The Government Printer, 1950),

<sup>11</sup> Tanganyika, *Annual Reports for the Year 1944*, 31.

<sup>12</sup> Tanganyika, *Annual Reports of the Provincial Commissioners on Native Administration for the Year 1950* (Dar es Salaam: The Government Printer, 1952), 41.

people.<sup>13</sup> As a capital, Dar es Salaam pioneered the election of councillors in Tanganyika towards the end of the 1950s. It is clear that this split was a political appeasement after the dock strike of 1950 which raised the political consciousness of the urbanites.<sup>14</sup> This means some of the administrative changes were merely political tools with no fundamental importance to the people. Moreover, the number of ward councils in the municipality was also increasing from 4 in 1949 to 12 in 1960.<sup>15</sup> The final district changes during the colonial period were made in 1958 and 1959. In 1958, Ilala District was formed and incorporated most of the peri-urban areas which were not under the jurisdiction of the Municipal Council. The headquarters of Ilala District headquarters were at Ilala Boma. The establishment of this new district dissolved Dar es Salaam District. There were now Ilala District and Dar es Salaam Municipality. On 1<sup>st</sup> July, 1959 the Provincial Commissioner of the Eastern Province formed a Dar es Salaam Extra-Provincial District which comprised all the urban areas under Dar es Salaam Municipality. The purpose of this change was to give power to the municipal councillors over local affairs and to reduce the powers of the District Commissioners.<sup>16</sup> On the other hand, the population was also rising fast in urban Dar es Salaam. According to the 1957 census, for instance, the 1948 population had doubled, reaching 129,000.<sup>17</sup> Immediately after independence, Ilala and Dar es Salaam extra-Provincial Districts were merged into a single district, which was named after the former Zaramo people chiefdom, Mzizima. The Zaramo had been the indigenous people of Dar es Salaam long before the arrival of the Arabs, Germans and British. In Mzizima District, urban concerns were addressed by the City Council of Dar es Salaam, whereas rural issues were under the jurisdiction of the Mzizima District Council. This arrangement continued existing up to 1968 when Mzizima District was dissolved and, in its place, Dar es Salaam District was formed. The district was formed following the encroachment of the urbanites into the peri-urban and rural Mzizima which necessitated expansion of the Dar es Salaam City Council.<sup>18</sup>

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<sup>13</sup> P H C Clarke, *A Short History of Tanganyika: A Mainland of Tanzania* (Arusha: Longmans, 1966), 133.

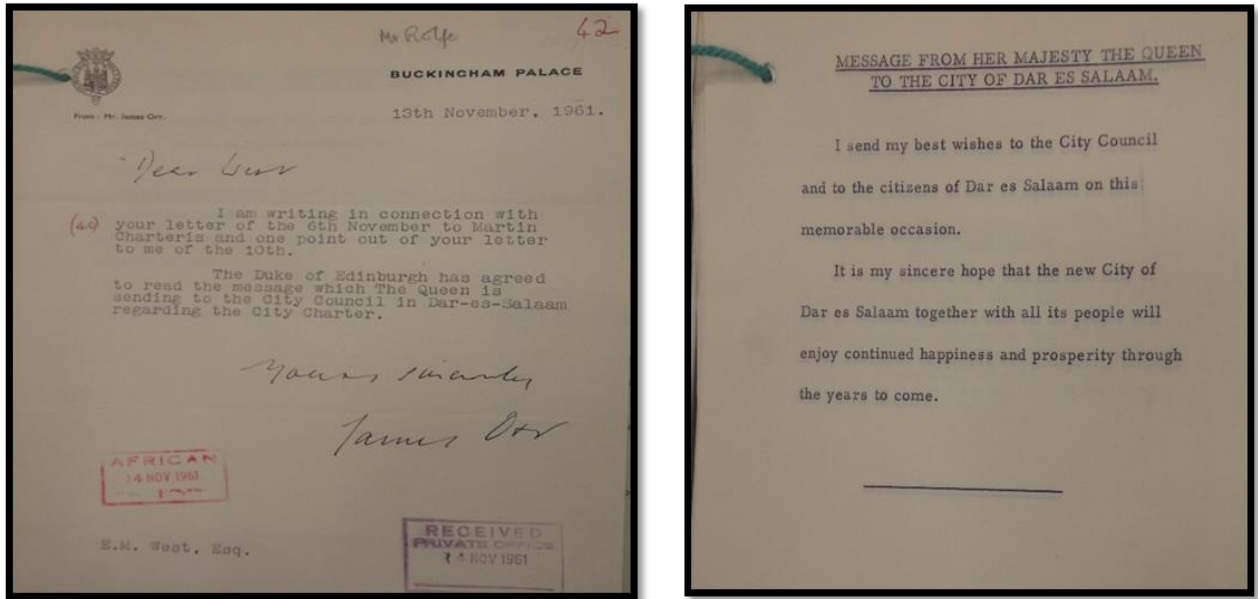
<sup>14</sup> *Ibid.*, 21.

<sup>15</sup> Tanganyika Territory, *Annual Reports of the Provincial Commissioners on Native Administration for the Year 1959* (Dar es Salaam: The Government Printer, 1960), 41.

<sup>16</sup> *Ibid.*

<sup>17</sup> URT, *1968 Dar es Salaam National Capital Master Plan – TS3: Economic Valuation* (Toronto: Project Planning Associates Ltd., 1968), 9.

<sup>18</sup> Central Zone National Archives (CZNA), LG81510 Part II: Dar es Salaam City Council: Boundaries and Layouts



**Figure 4.1:** Granting of City Status to Dar es Salaam in 1961 by Queen Elizabeth  
**Source:** BNA CO822/2863.

The administrative configuration and re-configuration coincided with the heightened wave of decolonisation. Hence, it cannot be the case that the changes and reforms made were an isolated development that sought to address urban challenges alone. As pointed out in the previous paragraph, the changes sought to appease the African working class during strikes as was the case in 1949 and 1950. The changes and reforms for urban governance made the colonial government pay more attention to African concerns. The key question is to what extent the concerns were dealt with? This question is answered in general terms by the historian John Iliffe in his *A Modern History of Tanganyika*.<sup>19</sup> However, a more specific answer concerning Dar es Salaam Municipality infrastructural networks is attempted in the subsequent sections of this chapter.

#### 4.1.2: Technical Governance Transitions

It is important to note that the reconfigurations stated above were made when many Global North cities were also undertaking post-war reconstruction. Since there were significant resonances in the pace of infrastructure construction in Dar es Salaam and Great Britain cities in the same period, this period may be called the era of ‘the high point of municipal engineering’<sup>20</sup> in colonial Tanganyika. This is because the infrastructural development undertaken in the last 15 years of colonial control were far better qualitatively and quantitatively than what had been built in the combined German and British five decades of colonialising Tanganyika. The professional and political governance, which Dar es Salaam underwent during the post-war era, emulated much from

<sup>19</sup> John Iliffe, *A Modern History of Tanganyika* (Cambridge: Cambridge University Press, 1979).

<sup>20</sup> John Abbott, *Green Infrastructures for Sustainable Urban Development in Africa* (London: Earthscan, 2012) 80.

the structure of the British local government. In Britain, the local government in urban areas operated structurally under the *Municipal Corporations Act of 1835*, the *Local Government Act of 1888* and the *Reform of Local Government Act of 1929*. The latter law, the culmination of amendments of the former Acts, indicated that a municipal or urban authority should deal with the following functions: administration, water provision and supply, sanitation, urban transport, waste management, street lighting, public cleaning, housing development, energy, drainage and storm-water management, telecommunications and communications. Similarly, the law provided for the structure of governance: the councillors were to be the political leaders of municipalities who were to be assisted by professionals, namely town clerks and treasurers. Under the town clerks were professionals like municipal engineers and medical officers.<sup>21</sup>

In Dar es Salaam, this technical governance assumed most of the functions and structural organs of the British municipal bodies, leaving some of the critical functions and bodies to the central government. They included functions like town planning, road engineering, water supply network engineering and the provision of housing services. In particular, the functions of the DMC were to “make, construct, alter, repair, and if necessary close all roads, streets, bridges, squares, ferries, sewers, drains and culverts under its control, and, with the consent of the Governor, make new roads.”<sup>22</sup> Whereas in Britain the governance personnel was split under borough representative, a town clerk and a treasurer, in Dar es Salaam the personnel was split under a ward councillor, a town clerk and a treasurer. Urban governance in Dar es Salaam was mediated by *the Municipal Ordinance of 1946* mentioned earlier. The fact that urban infrastructure governance, planning and engineering were under the different jurisdictions of the central government, departments and municipal authority in Dar es Salaam allows us analyse it using concept of infrastructure regimes. Marta Macedo, a Portuguese historian of science and technology, examines the concept ‘regime’ in relation to the science and technology of cocoa production in West Africa during the colonial era. Macedo states that there was transnational and trans-colonial circulation of technologies, in both knowledge and practice. The German Cameroon, for instance, borrowed rational methods of growing standard cocoa from Sao Tomé. The rational methods were not only about technology and practices but also about the administration of actors and the territory. In the territories, “planters, agronomists, engineers, and physicians...were simultaneously doing business, making politics, and producing knowledge.”<sup>23</sup> This is primarily defined by what the author refers to as ‘techno-scientific regimes’. To clarify it further, Macedo identified the four facets of the concept

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<sup>21</sup> *Ibid.*, 70-87.

<sup>22</sup> *The Municipalities (Amendment) Ordinance, no. 67 of 1948* in Tanganyika Territory, Ordinances Enacted during the Year 1948 (Dar es Salaam: The Government Printer, 1949).

<sup>23</sup> Marta Macedo, “Standard Cocoa: Transnational Networks and Technoscientific Regimes in West African Plantations”, *Technology and Culture* 57, no. 3 (July 2016), 560.



regime as follows: first, regime in terms of administration; secondly, a collection of technologies in both knowledge and material aspects which Macedo labels as techno-scientific assemblage; thirdly, the triumph of technology over nature and space; and finally, Sao Tóme as the laboratory of Western technologies.<sup>24</sup>

Macedo succeeds in offering us insights into the history of colonialism and science and technology. Macedo's concept of 'regime' has inspired the current study, which seeks to appropriate the elucidation of the concept. However, this study does not use the phrase 'techno-scientific' because it limits itself to specific economic aspects like the production of cocoa. Aspects related to urban infrastructure such as the planning and engineering of traffic and drainage in Dar es Salaam should have a specific analytical concept called 'infrastructure regime' in this study. In this study, infrastructure regime is understood as the body or authority with a definite role or set of powers over infrastructure planning, designing and construction. The authority becomes a regime either through legal means as is the case for Dar es Salaam Municipality or through constitution (or popular consensus) as for case of the central government and its departments such the Public Works Department (PWD). Infrastructure regimes can have different or overlapping objectives regarding infrastructural development because they operate under different terms and rationalities, which may sometimes affect the provision of infrastructure and urbanites.

The history of infrastructure regimes in the period between 1946 and 1961 in Dar es Salaam indicates that the central government through its various departments was very instrumental in shaping and defining the patterns and transitions of infrastructural networks. The central government, through its departments such as the PWD, Town Planning Department, Water Resources Department and Medical Services Department, could plan, design and construct various infrastructural networks for the people of Dar es Salaam Municipality. The government had more funds, expertise and political thrust than the Municipal Council of Dar es Salaam. However, the status of the Municipal Council was not affected, since local issues were dealt with more politically as Dar es Salaam was at the core of decolonisation politics in Tanganyika. It is likely that the central government was more practical in addressing urban concerns like housing, drainage and roads to safeguard the municipal councillors. Most of the councillors were elected from the wards and a few of them were appointed by the District Commissioner. More urban Africans were represented in the Municipal Council than in the central government. The question that the current study asks is about the extent to which African interests fared in the two infrastructure regimes. Through the concept of infrastructure regime, we can understand the dialectics of urban governance and compare it with the materiality that was produced.

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<sup>24</sup> *Ibid.*, 566.

The discussion of infrastructure regimes cannot be satisfactory if institutional changes in the central government departments are not considered to understand how Dar es Salaam infrastructural networks were planned and managed. It should be noted that some infrastructural networks were not under the central government, namely the port and electricity. The port was under the railway corporation while electricity was under a private firm called *DARESCO* (Dar es Salaam Electrical Supply Company Ltd.). However, the colonial central government and the metropolitan government played a significant role in the provision of the services and the development of the two systems. For instance, on 8<sup>th</sup> January 1949, Mr Arthur Creech-Jones – the Colonial Secretary of the British government in London – presented to the House of Commons about the transport problems at the port of Dar es Salaam that were created by the ongoing groundnut scheme. He also proposed some measures to address the problems.<sup>25</sup> Correspondingly, it was reported in the *Tanganyika Standard* of 15<sup>th</sup> January 1949 that the government was installing street lights in African areas for modernisation purposes.<sup>26</sup> The overlapping of regimes was complicated in 1948 when the East African British colonies, namely Kenya, Tanganyika and Uganda – established the East African High Commission for Common Services. The new establishment dealt with ports, railways, telephone and postal services in all member countries and in all rural and urban areas. In 1949, the organ of the Common Services planned to spend £1,811,901 for railway and ports improvements and maintenance of which £33,000 was set aside for the port of Dar es Salaam alone.<sup>27</sup>

There were institutional changes that were made in the central government in colonial and post-colonial Tanganyika. These changes were promulgated by emulating what was being done in Britain and by enacting relevant laws to facilitate the establishment of new organs. Most of the laws for making institutional changes were made between 1949 and 1960. Some of them were accompanied with constitutional reforms which were recommended by the United Nations for Tanganyika, a Trusteeship Colony.<sup>28</sup> What followed after Tanganyika's independence was a series of repeals and amendments of colonial ordinances to independent national laws. A good example is the *Upanga Repeal Act of 1966*, according to which the planning schemes for the Upanga area, predominantly inhabited by Asians, were repealed.<sup>29</sup> Most of the colonial laws were inherited by making insignificant amendments in wording, for instance replacing the word 'Governor' with the word 'President'. In other words, the content of the laws remained the same. Therefore, colonial

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<sup>25</sup> *Tanganyika Standard*, 08.01.1949; *Tanganyika Standard* 28.05.1949; *Tanganyika Standard* 25.06.1949.

<sup>26</sup> *Tanganyika Standard*, 15.01.1949.

<sup>27</sup> *Tanganyika Standard*, 30.04.1949.

<sup>28</sup> Iliffe, *Modern History*.

<sup>29</sup> CZNA PM/L20/4: Annual Land Report.

institutional governance largely remained intact in fundamental ways, signalling the continuity of the colonial urban regimes and their associated organisational cultures.

The institutions that dealt with urban planning and infrastructures before 1949 were under the jurisdiction of the government departments that had many functions, some of which were unrelated. For instance, town planning issues were under a small unit in the Lands and Mines Department. However, in 1949, a *Town Planning Act* was passed in the Legislative Council on the basis of which the Town Planning Unit was removed from the Medical Department control and quasi unit status. Through this law, town planning issues were combined with surveying activities under the Surveys and Town Planning Department. This Department came into effect on 1<sup>st</sup> of January 1950.<sup>30</sup> The formation of this department was significant not only for Dar es Salaam but also for the whole territory. With this department in place, permanent town planning staff members were recruited and the use of consultants such as Messrs Sir Alexander Gibb and Partners was abolished. As such, the importance of town planning was given due weight, partly because the PWD reported the lack of town planners in 1946.<sup>31</sup> The importance of the department was also highlighted by the Colonial Office in London through its report to the United Nations in 1951. The report explicated how the town planning division had helped the ongoing expansion of public utility infrastructure and services in Dar es Salaam and elsewhere in Tanganyika. The significant help was in the designing of new projects in collaboration with PWD and public utilities companies.<sup>32</sup> Such collaboration is what Mikael Hård and Sven-Olof Olsson refer to as ‘enforced marriage’<sup>33</sup> and echoes the organisational cultural changes sought by the current study.

Institutionally, matters concerning infrastructure were attended to by the PWD, an overall colonial government department dealing with planning, construction and maintenance of airports, sea and lake harbours, roads, railways, bridges, government offices and residential houses, street lighting, water supply, drainage and sewerage. The PWD was also responsible for designing and developing all projects through its designs and drawings section. The section also projected cost estimation and employed its workers. With all these responsibilities entrusted to the PWD, it could be argued that the PWD was a big, important and full-fledged autonomous arm of the government. The PWD was still an important department in the early years of independence but under a different ministry, namely the Ministry for Communication, Power and Works, this time. The

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<sup>30</sup> Tanganyika Territory, *Annual Report of the Department of Surveys and Town Planning 1950* (Dar es Salaam: Government Printer, 1951).

<sup>31</sup> Tanganyika, *Annual Report of the Public Works Department 1946* (Dar es Salaam: The Government Printer, 1947).

<sup>32</sup> Colonial Office, *Report on Tanganyika Territory for the Year 1950* (London: H.M. Stationary Office, 1951), 147.

<sup>33</sup> Mikael Hård and Sven-Olof Olsson, “Enforced Marriage: How District Heating and Electricity Systems Have Been Combined” in A. Kaijser and M. Hedin eds., *Nordic Energy Systems* (Massachusetts: Science History Publications, 1995), 187-204.

ministerial department status of the PWD began in 1958 following the coming into power of Tanganyika African National Union (TANU) and the constitutional changes that were made. Consequently, the PWD is mentioned under the Ministry for Communication, Power and Works in the 1961 Tanganyika National Assembly Hansard records.<sup>34</sup>

As pointed out in Chapter II, the post-colonial period saw more serious funding of infrastructural development, not only in Dar es Salaam but also in the rest of Tanganyika. As a result, the PWD played a significant role in linking policies and plans, real projects, landscapes, decision-makers and technocrats. It also became one of the instrumental players in the post-WWII colonial modernisation. However, storm water and roads were not coordinated in their spatial and technical work aspects. For instance, despite the knowledge of a series of floods affecting roads in year after year, no attempt was made to create a drainage section within the PWD traffic engineering.

It could be argued that the global road engineering profession was not trained in understanding drainage and stormy infrastructure as spatially and technically intertwined with roads. Evidence from the 1945 PWD annual report shows that new methods of roads construction were introduced in Tanganyika. However, those methods did not consider drainage aspect in road construction. The new methods were less costly than the previous ones. They were about road stratification and included “construction using the principles of soil stabilization and the application of bituminous carpets.”<sup>35</sup> These methods were introduced on an experimental basis in a few areas with a series of inspection work in the trial areas and in the neighbouring territories. It was stated that one of the reasons for making the innovation was the increase of traffic volume.

Another way of explaining the absence of organisational culture in the design and planning of drainage and traffic infrastructure was the fact the period between 1945 and 1961 witnessed drainage being conceived as being inextricably intertwined with anti-malarial engineering and sanitation. This perspective had existed since 1913 when Tanganyika was under German colonial rule. While during the pre-WWII era this perspective was backed by the *Extermination of Mosquitoes Ordinance of 1935* in Dar es Salaam,<sup>36</sup> the post-war era was backed by two laws, one of which was the *Public Health (Sewerage and Drainage) Ordinance of 1950*.<sup>37</sup> The two ordinances pre-empted the possibility of drainage and road planners and engineers working together. Thus, they cemented the organizational separateness which created the foundation of intersectionality of two types of

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<sup>34</sup> Tanganyika National Assembly, Assembly Debates for the Sitting from 10<sup>th</sup> – 20<sup>th</sup> October, 1961.

<sup>35</sup> Tanganyika Territory, *Annual Report of the Public Works Department 1945* (Dar es Salaam: The Government Printer, 1946), 6.

<sup>36</sup> TNA, 21507: Malaria Research.

<sup>37</sup> TNA, 450/649/1: Drainage Ordinance.

infrastructure, technically described as ‘innovation junction’ by Onno de Wit et al.<sup>38</sup> This technological culture was not confined in Tanganyika alone; it was circulated within the British Empire. For instance, the drainage ordinance of Nyasaland (modern-day Malawi), Uganda and Sudan – which was used in drafting of Tanganyika’s ordinance – indicated similar inclinations. This means that technological circulation was genuinely transnational not only in colonial agriculture as we learned from cocoa production in West Africa but also in urban infrastructure development and its associated legislations.

The drainage and anti-malarial campaigns continued even in the first decade of independent Tanzania. To support these services, the Ministry for Health and Housing, which during the colonial period was known as the Medical and Sanitation Services Department, was responsible for overseeing drainage systems.<sup>39</sup> This function was included in the organizational structure of the Ministry and also in the allocation of new housing estates in urban areas. In the case of housing, Mr A K Shaba, the Minister for Health, stated in 1968 that “housing estates have been established first in Dar es Salaam, later in a number of up-country towns ...”<sup>40</sup> Reallocating infrastructural issues from the institutions that dealt with other issues was not only limited to colonial and postcolonial Tanzania.

Explaining the development of municipal socialism in the late 19<sup>th</sup> century Germany, William H Dawson states that the Ministry for Home affairs was entrusted with powers over inspecting people’s compliance in sanitation and drainage infrastructure connection and maintenance.<sup>41</sup> Health and infrastructural issues were considered as security issues enough to be shifted from health and public works government departments.

While there were several institutional changes during the post-WWII period in colonial Tanganyika; the changes were mainly in administrative and technical parameters. With the exception of political representation in the Dar es Salaam Municipal Council, the institutional changes that ensued left the Africans in the periphery of all large technical systems organs. Through the PWD, Africans started being trained for lower-level skilled jobs for the Department in the late 1950s. Since the training took longer and could not have started without establishing educational institutions like the Technical Institute in Dar es Salaam, the impact was negligible, almost imperceptible even during the first decade of independence.

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<sup>38</sup> Onno de Wit et al., “Innovation Junctions: Office Technologies in the Netherlands, 1880-1980,” in *Technology & Culture* 43, no. 1 (2002), 50-72.

<sup>39</sup> CZNA, M.1/28/I: Medical and Sanitation.

<sup>40</sup> CZNA, LGRD/S14/5: Minister’s Speech.

<sup>41</sup> William Harbutt Dawson, *Municipal Life and Government in Germany* (London: Longmans, Green & Co., 1914), 90; Cf. T.C. Horsfall, *The Improvement of Dwellings and Surroundings of the People: The Example of Germany* (Manchester: University Press, 1904), 139-140.

According to the various reports and correspondences between the City Council of Dar es Salaam and the Ministry of Local Government and Regional Administration, many municipal and town councils had no local engineers. Some urban councils lacked or had a shortage of engineers, both local and foreign. In 1964, for instance, the Mayor of Dar es Salaam, Mr M Mfaume, told councillors that capital works of City Council were not implemented by 35% in 1963 because of the shortage of engineers. He added that the West German Government had promised to offer two qualified engineers for the Council.<sup>42</sup> Thus, most technical experts were from abroad and worked as foreign expatriates or technical aid. By foreign expatriates, we mean all the foreign nationals hired by the government of Tanzania, but by technical aid, we mean all the foreign nationals who were working as volunteers or sent by their countries, which sought to assist technical operations of the local and central government institutions. In a letter dated 23<sup>rd</sup> February 1967 from the Town Clerk for the City Council of Dar es Salaam to the Secretary for the Local Government Service Commission, it was reported that the City Council had received two German national volunteers, namely, Ms Anneliese Hartmann as a Nursery School Teacher and Mr Jochen Kessen as an engineer. In another letter dated 8<sup>th</sup> October 1966 written by C A Kallaghe who was the Permanent Secretary for Ministry of Regional Administration to the Principal Secretary for Dar es Salaam indicated that “the City Engineer and the Deputy City Engineer are technical aid personnel from West Germany.”<sup>43</sup> Reliance on technical aid for engineers and other critical technicians like motor mechanics at the City Council persisted until the 1970s.<sup>44</sup>

The foreign expatriates formed the critical manpower base for most public institutions in the first two decades of independence. The dependence on foreign technical personnel was critical not just in the urban councils but also in glorious national institutions like the University of Dar es Salaam. Bilateral and multilateral agreements as well as individual volunteers supplied the needed expatriates. One example was the British Expatriates Supplementary Scheme, through which the British government sent and paid the salaries of the British technical experts at the University of Dar es Salaam following an acute shortage of academic staff.<sup>45</sup> The central government of independent Tanzania also went into agreement with the British government in 1962 to retain some of the civil service personnel in many critical government departments until the country was able to replace them.<sup>46</sup> This dependence on foreign experts in the first two decades of independence

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<sup>42</sup> *Tanganyika Standard*, 08.01.1964.

<sup>43</sup> CZNA, LGSC/E.10/1/53: Establishment of Dar es Salaam City Council Vol.III.

<sup>44</sup> See Telegram from Director of Local Government (Mitaa) to Treasury dated 23.02.1971 on placement of Danish volunteer engineer and Telegram from ESTABS to LOGCOM Dar es Salaam dated 15.02.1967 on Swedish mechanical volunteers all in CZNA, S1/4: Swedish Volunteers.

<sup>45</sup> BNA, Ref. no. BW90/1364: University of Dar es Salaam. In this file the names of the British expatriates under BESS policy are listed and the sum of the monthly salaries.

<sup>46</sup> BNA, DO118/233: Tanganyika: United Kingdom Public Service Officers Agreement – Dar es Salaam.

can be interpreted as a legacy of colonial education which had emphasized on ethnocentrism, manual and semi-skilled trades and works such as agricultural and simple vocational skills. Underscoring this path dependence which was consolidated in the post-WWII era, the historian John Iliffe writes:

Tanganyika's educational backwardness brought repeated criticism from London, but the ten-year plan approved in 1947 preserved the pre-war emphasis on primary schooling adapted to village life. 'Based on the existing structure with as little interference with it as possible,' the plan's chief aim was to increase school places, and in this it succeeded. Between 1948 and 1955 the proportion of government's recurrent expenditure which went on education rose from 6 to 14 per cent.' The problem was the type of schooling provided. The plan's central feature was a distinction between primary schools, providing four years of education, and middle schools which would take 20 per cent of primary school leavers and give them four further years of vernacular schooling with an agricultural bias.<sup>47</sup>

The path dependence critiques advanced by imperial historians like Martin J Wiener agree that colonialism had its fair share in making of the new nations – i.e. nations that had just got their political independence and lacked qualified and adequate technical staff.<sup>48</sup> Wiener concedes that “new nations had been crippled at their birth by the continuing institutions, arrangements, and culture of their colonizers.”<sup>49</sup> However, like other critics of the legacy of colonialism, he presents strong defence by arguing that “‘Path dependence’ – historical inertia – did not begin with decolonization; actually it applied to the precolonial and colonial periods as well as to the colonial era.” In other words, colonialism is not the only cause of development problems that many Global South nations experienced after independence. He calls for scholars – including post-colonial theorists led by Edward Said – to equally consider the pre-colonial legacies that might have contributed to making conurbations in the march towards achieving (Western) modernity.<sup>50</sup>

Wiener also argues that, in the 1960s, many countries that had just got independence like Malaysia and Kenya, were equal in terms of development. Three decades later, Malaysia was competing with the Global North in modernisation, while Kenya remained stuck in poverty and backwardness. This difference in development cannot be attributed to the colonial legacy, but to the nationals and their leaders instead. He continues offering more examples of other African countries that have remained stagnant and politically unstable but blame colonialism.<sup>51</sup> Considering the path dependence fanfare among African countries with respect to their problems, this study seeks to reiterate the view that the colonial legacy was instrumental in trapping the march towards

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<sup>47</sup> Iliffe, *Modern History*, 444.

<sup>48</sup> Martin J. Wiener, “The Idea of ‘Colonial Legacy’ and the Historiography of Empire”, in *The Journal of the Historical Society* 13, no.1 (March 2013): 1-32.

<sup>49</sup> *Ibid.*, 6.

<sup>50</sup> *Ibid.*, 21-22.

<sup>51</sup> *Ibid.* 29-32.

achieving modernity. The study argues that the colonial legacy in the colonised world has been overlooked as little was done to examine the impact of the path dependence on it, contrary to Werner's position. This study seeks to find out how colonialism advantaged the Global North at the expense of the Global South.

Walter Rodney, a revisionist scholar of Marxism, once argued that colonialism had taken almost four centuries to make such nations as France, Britain, Germany and USA powerful technologically and developmentally. In his seminal work, *How Europe Underdeveloped Africa*, Rodney indicated how British merchants and industrialists copied the cloth and bronze ware production technologies from several areas in Africa before they destroyed such industries through the enslavement of skilled Africans. He contends that enslavement contributed in bringing the state of lawlessness and violence which again was used by the same slave masters to justify colonialism.<sup>52</sup> What Wiener and other critics do not consider is the contribution that pre-colonial Africa made to technological advancement such as marine transport, mass industrial production and warfare in the Global North. He also overlooks the combined deep impact of slavery and colonialism on African peoples, an experience that never befell areas like Malaysia, which are cited as perfect examples of colonised but developed countries. In so doing, Wiener is committing the typical capitalist fallacy of comparing the unequal as argued by Frankfurt school theorists Max Horkheimer and Theodor Adorno in their critique of enlightenment philosophy. Horkheimer and Adorno believed that "bourgeois society is ruled by equivalence. This fallacy makes dissimilar things comparable by reducing them to abstract quantities." This disposition was summarised in a Latin sentence: *Si inaequalibus aequalia addas, omnia erunt inaequalia* [sic] translated literally to mean "if u add like to unlike you will always end up with like."<sup>53</sup>

It cannot be denied that the pre-colonial and colonial events had a great influence and contribution in the making of modern African countries by looking at the inherited social, political, economic and technological structures alone. But one needs to also consider the impact of the Cold War that began soon after independence. The Cold War made most African countries the battleground for the rivalry between the West and East.<sup>54</sup> This included the inability to access loans for development projects by the nations that did not side with others. The development loans and aid given to countries were little but with high interest rates. This situation made Ali Mazrui, a great

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<sup>52</sup> Walter Rodney, *How Europe Underdeveloped Africa* (London: Bogle-L'Ouverture, 1972).

<sup>53</sup> Max Horkheimer and Theodor W. Adorno, *The Dialectic of Enlightenment: Philosophical Fragments*. Translated by Edmund Jephcott. (Stanford: Stanford University Press, 2002), 4.

<sup>54</sup> See instances of Cold War technological rivalry in Africa in Jamie Monson, *Africa's Freedom Railway* (Indianapolis: Indiana University Press, 2009): 3-11.



African political scientist, to conclude that in the march towards the 21<sup>st</sup> century, African development was truncated.<sup>55</sup>

The term ‘truncated’ probably explains well why dependency on foreign experts in urban projects and councils like Dar es Salaam became inevitable. “Dependency”, borrowing words of Ali Mazrui, “is truncated capacity for self-reliance.”<sup>56</sup> Colonised Tanganyikans were not trained in higher technical skills and professions like engineering. They were trained in communication skills and basic agricultural knowledge but not in industrial production and high technical skills.<sup>57</sup> As we will also see in the next section, the first phase of the Dar es Salaam Technical College that was completed in 1957 aimed at training intermediary technical skills like mechanics, accountants and business managers. This was a signal that the colonial authorities were trying to amend the bias of the education system that they had established. However, the initiative came late and its impact was minimal compared to the existing needs of skilled manpower and the total population in the territory. Furthermore, the faculty of science was established in 1964 at University College Dar es Salaam, but engineering degree programmes were introduced in the mid-1970s. The university was predicated by the recommendations of Professor Bullough from the University of Leeds in UK to start teaching the basic science subjects only, namely Mathematics, Chemistry, Physics and Biology.<sup>58</sup> The University College, and later the University of Dar es Salaam, was the only university in Tanzania from 1961 to the early 1990s. This shows why independent Tanzania and the Dar es Salaam City Council did not have any Tanzanian engineers in the 1960s and 1970s.

#### **4.2 Modernity Discourses: State, Media and other Actors**

As archival sources show, the development of infrastructure was radically changing the face of Dar es Salaam more than of any other part of colonial Tanganyika. Up to 1961, the colonial state was responsible for shaping the policies and framework for urban infrastructure. The colonial actors within and outside Tanganyika were involved in many ways. It was pointed out in the previous section that there were actors from the Colonial Office in London - UK, from the central government in Tanganyika territory and at local level in Dar es Salaam Municipal Council. Similarly, in government departments like PWD, permanent employees were mainly foreigners of British origin usually moving between Tanganyika and UK or within the larger British Empire. The 1947

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<sup>55</sup> A.A. Mazrui, “Toward the Year 2000” in *General History of Africa: Africa since 1935*. Vol. VIII edited by A.A. Mazrui (California: Heinemann, 1993): 905-933.

<sup>56</sup> *Ibid.*, 924

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

<sup>58</sup> BNA, BW90/138: East Africa: University of Dar es Salaam, Establishment of a Faculty of Science; Cf. Isaria N. Kimambo, Bertram B.B. Mapunda and Yusufu Q. Lawi, eds., *In Search of Relevance: A History of the University of Dar es Salaam* (Dar es Salaam: Dar es Salaam University Press, 2008).

PWD report stated that, “an Architect joined the Department on transfer from the Falkland Islands and an Executive Engineer, Grade I, on transfer from Zanzibar.”<sup>59</sup> Understanding that there were many levels of actors and technological circulation within the colonial realm can help us to explain the dialectics of modernity that ensued.

Nonetheless, the various reports of the PWD did not identify Africans as significant actors in the forging of modernity through engineering works. To be exact, annual reports from 1945 to 1956 did not mention Africans as employees of the Department. Africans working in the PWD were considered as casual labourers whose mention appeared only when there was a strike or their shortage. Given the low level of infrastructure construction using machinery throughout the colonial period, it is important to consider the African agency in shaping modernity in Dar es Salaam. This is because there was not only common denial of African agency in manual construction labour but also in recognizing the urban Africans. The colonial government started recognising urban Africans as legitimate and permanent residents of Dar es Salaam after planning to survey selected African areas and building a few simple and cheap houses for them in 1946. The colonial state started recognising Africans in the PWD (and other departments) when it started the construction of Ifunda Technical School in Iringa and the Technical Institute in Dar es Salaam from 1956.<sup>60</sup> Technical education qualification was, therefore, a significant factor for Africans to be considered as employees of the PWD analogous to the way formal housing facilities were considered a criterion for legitimising residence in urban Dar es Salaam. Below is a picture of the institute taken in 1957 when its construction was nearing completion.

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<sup>59</sup> Tanganyika Territory, *Annual Report of the Public Works Department 1947* (Dar es Salaam: The Government Printer, 1948), 2.

<sup>60</sup> Tanganyika Territory, *Annual Report of the Public Works Department 1957* (Dar es Salaam: The Government Printer, 1958).



**Figure 4.2:** The First Phase of Technical College, Dar es Salaam, in 1957

*Source: PWD 1958 Annual Report.*

The colonial modernity has been explained differently by historians of Tanzania and the British Empire. Writing of the concept modernity in relation to urban planning in colonial Zanzibar, William Bissell defines it on the basis of experiences and perceptions on the new urban relations mediated through space. In that case, modernity would be the new master plans on paper and their associated materiality or reality on the ground. Such kind of modernity comes through power relations and forge new experiences and socio-cultural relations between those who introduce them and the supposedly recipients. Although Bissell concludes that Zanzibar depicts one of the failed stories of modernity, he sees modernity as having the duality of material and immaterial unfolded through power, racial and cultural processes.<sup>61</sup> Since power is important in understanding modernity, urban modernity and other forms of modernisations were monopolised by the state and local governments. The general public was kept at bay, and therefore, it was nipped of its democratic participation in modernisation other than through its articulation, appropriation and resistance.

In the post-WWII era, the colonial empires launched a new wave of modernity, which was revealed through a host of heavy investments in large technical systems. As we saw above with respect to the state and municipality-heralded modernisation in Dar es Salaam, the British post-war funds under the *Colonial Development and Welfare Act of 1940* were instrumental in the whole

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<sup>61</sup> William Cunningham Bissell, *Urban Design, Chaos, and Colonial Power in Zanzibar* (Indianapolis: Indiana University Press, 2011).

British Empire. John Iliffe has called that state-heralded modernity the ‘Second Colonialism,’<sup>62</sup> during which the British modernised the colonial territories for altruistic reasons, because they did not want to have poor and undeveloped territories and subjects.<sup>63</sup> The impact of this modernity was largely dependent on a few state actors’ decisions. Iliffe says that, in Tanganyika, it was because of the new Governor’s desire that much of the disbursed funds were used to improve the quality of infrastructure such as water, roads and electricity, instead of conforming to the directives of the London government which emphasised investing in agriculture and tribal education. As such, between 1949 and 1958 most of Tanganyika’s highways were passable throughout the year; the townships and the municipality of Dar es Salaam also had new basic infrastructure. It was also during the same time that the Master Plan for Dar es Salaam was prepared and its implementation started. Because of this plan, the African and Asian areas were planned for the first time as part of Dar es Salaam Municipality. This was a deliberate action of modernising the city and its inhabitants through space and infrastructure. However, the resultant modernity cemented divisions along the lines of class, race, space, materiality and social relations.

Historicising African modernity in 2002, the historians Jan-Georg Deutsch, Peter Probst and Heike Schmidt noted that colonial modernity exhibited a high degree of spontaneity. Colonial modernity was not uniform and it had “the fragmentary character.” It was, thus, influenced by a multiplicity of forces, depending on context. They viewed colonial modernity as “contagion” in that it was an outcome of the contact between the West and different social worlds in the colonies.<sup>64</sup> Many colonial officials subscribed to the contagion thesis. For instance, Sir Alexander Gibb argued in 1949 that “rapid introduction of western civilization naturally brought about an abrupt change in the life of Dar es Salaam’s native population” one of the changes being getting “better paid employment under their European masters.”<sup>65</sup> Examining various studies on colonial modernity, the three scholars were convinced that contagious modernity became evident between the 1930s and 1960s. They also warn us against comparing African modernity to Western modernity. While that caution is highly commendable, it would be prudent to extend the period of colonial modernity to the last quarter of the 19<sup>th</sup> century, since that is the moment when colonial modernisation began to exert its influence on the continent. A study by Casper Andersen indicates that it was in the

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<sup>62</sup> This concept was coined for the first time by D.A. Low and John Lonsdale. See Nancy J. Jacobs, *African History through Sources: Colonial Contexts and Everyday Experiences, c. 1850-1946* (New York: Cambridge University Press, 2014), 307.

<sup>63</sup> Iliffe, *Modern History*.

<sup>64</sup> Jan-Georg Deutsch et al., “Introduction: Cherished Visions and Entangled Meanings” in *African Modernities: Entangled Meanings in Current Debate* edited by Jan-George Deutsch et al. (Portsmouth & Oxford: Heinemann and James Currey, 2002), 3-6.

<sup>65</sup> Tanganyika Territory, *A Plan for Dar es Salaam: Report* (London, Nairobi & Dar es Salaam; Sir Alexander Gibb & Partners, 1949), 13.

latter moment that the modernity discourse on Africa started in various circles of the colonial empires, particularly in the British Empire. Engineers and their apologists in the metropolitan and in the colonies sought to impose technological projects on Africa as a way of modernising the continent. Civil engineering was perceived to be an important and powerful tool of civilising the continent and its people even more than Christianity was.<sup>66</sup>

In the first decade of independence, the municipal and state-led modernisation persisted. Archival records retrieved from Dodoma, Tanzania, reveal that no modernisation could be made in Dar es Salaam without the consent of the central government. It had to wait until May 1972 when the state decided to devolve powers over the local authorities through the *Madaraka Mikoani* document. *Madaraka Mikoani*, literally ‘decentralisation’, espoused the bottom-up approach in decision-making and actions.<sup>67</sup> People were given the power to decide what they wanted, when and how they would achieve it. The people could choose and appropriate modernities that suited them, at least theoretically. An important question to ask ourselves when discussing *Madaraka Mikoani* is about the consequences it had on the previously imposed and contemporaneous urban modernity.

Borrowing Emily Brownell’s phrase – landscape of deferral<sup>68</sup> – we might argue that *Madaraka Mikoani* was a reactionary document to the monopoly of decision-making and control over funds, which was regarded as delaying national progress. It sought to remove all deferrals towards progress. In the document, the government ministries and other central government departments were said to be the main cause of deferral. Progress delay was not the only thing that was condemned. Even the salaries of the workers who were serving the grass-roots communities were deferred because of the long bureaucratic chains that had to be cut as they caused lamentations from the workers and reduced their morale.<sup>69</sup> Planning and decision-making powers were devolved to regional and district levels. At district level, for instance, “the district councillors together with National Assembly representatives from the district were to be members of the newly formed district development councils.” Other members included the District Commissioner, the district technical staff, the district party chairman and the District Director.<sup>70</sup> The level of decision-making and planning descended to the ward and village or street levels. It was this latter step that enabled the people to be involved in planning. People and their representatives, thus, became important actors in the modernisation from below.

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<sup>66</sup> Frank Edward, review of *British Engineers and Africa, 1875–1914* by Casper Andersen, *African Studies Review* 59 (3) (December 2016): 253–54.

<sup>67</sup> See “Madaraka Mikoani” document in CZNA, PM/R50/20: Regional D.D. Quarterly Reports – Dar es Salaam.

<sup>68</sup> Emily Brownell, *Gone to Ground: A History of Environment and Infrastructure in Dar es Salaam* (Pittsburgh: University of Pittsburgh Press, 2020), 92.

<sup>69</sup> CZNA, PM/R50/20: “MadarakaMikoani”

<sup>70</sup> *Ibid.*, 4.

A critical scrutiny of the *Madaraka Mikoani* document reveals that it emphasised impacting positively on non-urban locations. On page 3 of the *Madaraka Mikoani* document, for instance, it was stated that “urban and other town Councils will continue as at present for the time being.” But several researchers have stated that *Madaraka Mikoani* had negative effects for Dar es Salaam. One of the reasons mentioned is that funds were not forthcoming after the declaration of *Madaraka Mikoani* in 1972.<sup>71</sup> Moreover, archival records indicate that funds were undistributed not only after the *Madaraka Mikoani* but also in the period before its declaration. In several instances, Dar es Salaam City had to borrow funds to execute some of the development projects like market construction.<sup>72</sup> The organisational culture of urban governance was the brainchild of the British (metropolitan) local government. Urban governance circulated to Tanzania through colonialism. As demanded by the regulations, local governments, including the urban councils, are required to have their own sources of revenue, obtained from such services as the water supply, sanitation services, municipal levies and others. Nevertheless, the revenues generated were insufficient because the City Council of Dar es Salaam – unlike those of the British and other Global North cities – did not run and control infrastructural services like sanitation, water and transport in their entirety. In the colonial days, such services were controlled by non-municipal government departments, especially the PWD and the Water Department. The municipal council was limited to making the by-laws and regulations governing the provision of the services. Its main sources of revenue were the market levies from the less than 10 markets that it owned and managed. As a result, the municipal council relied on the central government for funds for doing various activities and projects discussed and planned at their level. The reliance on central government for funds was common during the colonial days and the post-colonial era. In several letters from the City Clerk to the Permanent Secretary and the Director for Local Government, the clerk bemoaned the paucity of funds like funds for “grass cutting in city gardens and roads,” for unimplemented projects and capital projects recommended by the City Engineer and the Medical Officer.<sup>73</sup>

A survey of newspaper headlines and features would have illuminated how the people viewed the modernisation of Dar es Salaam City, especially in the early post-colonial era. It is unfortunate that, in that period, the newspapers were very political in their reportage, covering much the new projects and development from the state perspective. Some researchers have implicitly made comparisons between colonial and post-colonial modernisation through the prism of technological circulation. A historian of Sino-Africa technological transfer, Jamie Monson, has

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<sup>71</sup> See, for instance, in Brownell, *Gone to Ground*; additional negative impacts on urban development of *Madaraka Mikoani* are discussed in detail in Chapter V of this thesis.

<sup>72</sup> CZNA, LGLB 58: Loan to Dar es Salaam City Council.

<sup>73</sup> CZNA, LG 82910/72: Dar es Salaam City Council: Estimates.

suggested distinguishing between modernity through domination and modernity through mutual friendship.<sup>74</sup> Modernity through domination is that in which technology was transferred at material level without imparting skills to the users and, probably, future managers, too. In the records retrieved from Dodoma, a letter from the Vice-President of Tanganyika to Area Commissioners – dated 26<sup>th</sup> July 1963 – prohibited the commissioners from driving GT vehicles, since the insurance companies demanded that only the drivers trained and certified by GT drive them. If they drove them and if an accident occurred, the insurance companies and GT would not service the vehicles.<sup>75</sup> This kind of technological circulation does not provide room for appropriating technology since the latter is transferred only at the level of device or materiality, denying users the knowledge or immaterial level of technology. The users are denied the capacity to tinker with technology as its knowledge is the monopoly of the few. Hence, their innovative aspirations are nipped in the bud. This was, by and large, a characteristic feature of the colonial modernisation that has persisted to the post-colony.

Modernity by mutual friendship, which is discussed in Monson's work, is one in which material and knowledge levels of technology are transferred together to users and managers. This falls into the category of post-colonial modernisation. With respect to the building of TAZARA<sup>76</sup> from 1969 to 1975 with the Chinese capital and technology in Tanzania and Zambia, Monson says:

Technology was transferred materially during the railway's construction, in form of rails and ballast (the permanent way) as well as wagons (the rolling stock) and locomotives. Technology also took the form of knowledge, conveyed through "teaching by example" on the part of the Chinese technicians, although this was unevenly distributed.<sup>77</sup>

The above distinction serves as a good dichotomy of colonial and post-colonial urban modernity as well as of Western and Eastern technological circulation and appropriation in the Cold War era. There is no record from the City Council of Dar es Salaam between 1961 and 1999 that indicates that all foreign engineers attempted to train local foremen and engineers. No wonder, then, that, whenever their contracts ended, the City Council requested outgoing staff replacement immediately. The fact that foreign engineers' replacement was sought frequently during the early decades of independence tells us of shortage of local engineers as well as the inevitable demand of technological expertise. The engineers became key actors in the modernisation of the city. This modernisation built upon the colonial period materiality falls into the category of "modernity as

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<sup>74</sup> Monson, *Africa's Freedom Railway*.

<sup>75</sup> CZNA, T4/1: Transport.

<sup>76</sup> TAZARA is an acronym for Tanzania and Zambia Railway Authority. This railway was built to provide port access to the landlocked Zambia at the time when South African apartheid regime denied her of using her ports to import and export important items unless it stops supporting the anti-apartheid movement.

<sup>77</sup> Monson, *Africa's Freedom Railway*, 8.

necessity.”<sup>78</sup> The latter became a dominant scenario in most post-colonial cities, not just in Dar es Salaam. Furthermore, staff replacements hint that engineers – who invariably came from the Global North – perceived engineering knowledge as esoteric. They did not intend to ensure the sustainability of the structures (materialities) and practices they constructed and maintained in the city. It also implies that they only gave orders to the semi-skilled and unskilled labour force without seeking to transform it, unlike the Chinese engineers who built TAZARA. Modernity heralded in that way was bound to fail or have certain consequences for the users in the near future as it was brought as a black box technology embedded with exclusive and isolated elements.

### 4.3 Materialities

In this work, the term ‘materiality’ refers to the physical attributes of technology, the artefacts, specifically urban infrastructure like traffic, drainage and the water supply. It is used against the soft, or rather, non-physical manifestations of technology such as knowledge, ideas and practices. When combined, the material and immaterial attributes constitute technology as we know it. In urban Dar es Salaam, infrastructure was an outcome of the processes and actions of many institutions and individuals. In the temporal parameter of this chapter, most of the infrastructure was an outcome of the British imperial, national and local development. National development was conceived in the interwar Colonial Development and Welfare Act discussed earlier and it was implemented after the 10-Year Development Plan of 1946-1956<sup>79</sup> and the post-colonial development plans of 1961-1964 and 1964-1969. These national plans sought to develop and improve national infrastructure and social services in both the rural and urban areas. Development plans were, therefore, the first major factor for drainage and traffic infrastructural development in Dar es Salaam.

The colonial development plans were a translation of the Colonial Development and Welfare Act of 1940, which was modified in 1945. The law was an imperial factor as it was not only about Tanganyika, although it was Tanganyika that benefited more than any other British colony owing to the UN calls, the German counter-propaganda and Britain’s internal factors. The plans began throughout the British colonial Africa in 1946. A total fund of about £52,150,000 was set aside for implementing plans.<sup>80</sup> Territorial and urban infrastructure received greater attention than it did before WWII, since colonial exploitation could no longer continue without development. The historian Nancy J Jacobs says that:

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<sup>78</sup> Deutsch et al., “Introduction”, 7.

<sup>79</sup> See for instance in BNA, CO691/198/10: Development in Tanganyika: Ten Year Development Plan – Road Construction Programme.

<sup>80</sup> Jacobs, *African History*, 313.



... these large-scale infrastructural and social projects were not what is meant by 'development' today. During the postwar moment, the emphasis was not on "grassroots" participation, on helping "the poorest of the poor", or on specific needs of women. The projects were not so different from those in noncolonies. In the United States, the Soviet Union, and Brazil, governments planned cities, built dams, and promoted scientific farming techniques.<sup>81</sup>

The contention by Jacobs that such infrastructural development was not in stark contrast with other contemporary large technical projects in the Global North and the Global South supports the argument that technological circulation took place with fundamentally similar ideals but with different objectives. Whereas the shared ideal was the modernisation of cities and territories through modernist planning; the objectives of the colonial modernity in city infrastructure such as roads was to perpetuate colonial control by showing the good face of the colonial masters. To put bluntly, technology was being used for political ends in that the colonial subjects were being prepared to accept colonialism as a good phenomenon. In Africa, this functionalist approach to technological circulation was practised by the British and the French. The French version was known as *Fonds d'investissements pour le développement économique et social* (FIDES).<sup>82</sup>

In the whole of Tanganyika, the post-WWII colonial development funds were used to implement various economic projects and infrastructure projects in both the urban and rural areas. The pace of investing in infrastructure between 1946 and 1948 was slow and unconvincing. It was not until 1949 that the pace of infrastructural development in Tanganyika gained a new vitality and vigour. The historian John Iliffe attributes this vitality to the arrival of a new governor of Tanganyika, Sir Edward Twining. Iliffe says that "Twining was a developer ..." and that he "became Tanganyika's most important governor, and Britain lost Tanganyika."<sup>83</sup> Given that before Twining's arrival, Britain had ruled Tanganyika for three decades with a remarkable reluctance to develop the territory, Iliffe's statement is correct. One of the things that vindicate Iliffe's assertion is Twining's revision of the 1947 Ten-Year Development Plan, in which he increased the budget from over £19 million to over £24 million, of which more than £8.7 million was for national infrastructure and more than £8.2 million for urban infrastructure and housing.<sup>84</sup> The other piece of evidence is found in the annual reports of the PWD released from 1949 to 1961 when more projects were implemented than they were in any other period. Twining's zeal to develop, or rather, to modernise Tanganyika was not received well in London. In one correspondence, for instance, dated 25<sup>th</sup> February 1954 from S J Field to Mr Martin and Formoy of the Colonial Office, it was

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<sup>81</sup> *Ibid.*, 311.

<sup>82</sup> *Ibid.*, 307

<sup>83</sup> Iliffe, *Modern History*, 442.

<sup>84</sup> *Ibid.*, 443.

pointed out that “Tanganyika has been working on a wrong basis in their claims for issues of these C D and W grants, as a result of which the grants are overdrawn.”<sup>85</sup> This complaint was grounded in the fact that the Governor of Tanganyika was revising the old development plans and seeking more money for infrastructure. There is no evidence showing that Twining balked in his personal devotion to develop Tanganyika until his tenure ended in 1958.

Being the capital of the territory and the most populous urban place in Tanganyika, Dar es Salaam received the lion’s share of urban infrastructure investments. For instance, whereas other urban centres had one or no main public water supply source, Dar es Salaam had four water sources by 1959, up from the two it had in 1949.<sup>86</sup> Twining’s agency added a new impetus for urban drainage and traffic infrastructural development nationally and locally, as was for Dar es Salaam City. Most of the materialities’ ‘progress’ was shaped by the activities of the central government through the PWD and the Municipal authority in implementing fully or partially the 1949 Master Plan for Dar es Salaam and the 1950 Drainage Ordinance. Materiality development and expansion were supplemented by the housing schemes in Zones II and III,<sup>87</sup> which indirectly incorporated infrastructure provision. A good example was the 1950 *Upanga Area Planning Act*, which led to the development of a residential area for Zone II, and the Magomeni, Ilala and Kinondoni housing schemes for Zone III. In housing, just as in general urban infrastructure, Dar es Salaam got a huge expansion and investment. For instance, of the planned 484 African urban houses for Tanganyika in 1951, 298 houses were to be built in Dar es Salaam alone. Other urban centres were allocated little funds for building a few houses, as follows: Mtwara (20), Tanga (26), Tabora (20), Mwanza (30), Morogoro (15), Kilosa (15), Mbeya (20), Iringa (20) and Moshi (20).<sup>88</sup>

Financial, legal, engineering, political and medical forces were entangled in decision-making and the discussions of what should define the design, function and scale of the drainage infrastructure in Dar es Salaam. All these forces converged in the period between 1947 and 1954. The major reason behind the serious consideration of the drainage system was the impact of floods and rains in the city, which was infrequently accompanied by road damage, high incidence of malaria and a host of several water-borne diseases. The final product was the *Public Health (Sewerage and Drainage) Ordinance No. 42 of 1950*, which was assented to in 1954,<sup>89</sup> a law which legalised funds

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<sup>85</sup> BNA, CO822/1097: Colonial Development and Welfare Projects for Road Construction in Tanganyika

<sup>86</sup> See the opening of the fourth source, Ruvu River Water Supply in Tanganyika Territory, *Annual Report of Public Works Department 1959* (Dar es Salaam: The Government Printer, 1960), 6.

<sup>87</sup> See the telegram from the Secretary of State for Colonies to Governor of Tanganyika dated 31.12.1951 in BNA, CO822/592: Colonial Development and Welfare Scheme for the Construction of Urban Houses in Tanganyika 1951/1953.

<sup>88</sup> *Ibid.*

<sup>89</sup> TNA, 450/649/1: Drainage Ordinance.

for drainage, defined the design and punctuated the future drainage system in Dar es Salaam. The making of the ordinance involved different actors, and not merely those involved in public health or works. What is more interesting is that the central government took the initiatives to enact a law that was fundamentally not new, but that which drew lessons from different colonies in Africa. The British colonial government took some lessons from the *1937 Kampala Drainage Ordinance* and the *1947 Sudan Public Health Ordinance*.<sup>90</sup>

Whereas the law was intended to curb the heightened incidence of malaria, the concern came also to increase its connection to roads and creeks. It also incorporated things related to sewage and sanitation so much so that the law should have been dubbed the Drainage-cum-Sewage Act. This is justified in that, during decision-making, the Medical Department had not made a quintessential decision on what had to be inserted into or removed from the ordinance. They also relied on input from the Legal and the Social Services departments, which addressed most of the social issues in the government and in the Legislative Council.<sup>91</sup> We can say that there was organisational coordination that gave room for a mutual exchange and circulation of drainage knowledge within the colonial state and within the global colonial empire of the British. The success of the *Drainage Act* was, however, realised at the end of the colonial era as in the period before its implementation local people were not involved in any step. It is interesting to note that professional networks were loosely forged through this ordinance. This law was very palpable and more effective in the urban areas than in the rural areas as it was in the areas where there were many people affected by malaria and where there were huge drainage problems. Dar es Salaam offers us striking lessons on how it was implemented.

The revised 10-year development plans, the Municipal Council and the *Public Health (Drainage and Sewerage) Ordinance* were not the only instruments that shaped the infrastructure of Dar es Salaam. Archival records indicate that drainage and other kinds of infrastructure were also invariably identified in annual acmes of works to do suggested by the District Commissioners (DCs) and the quasi-Town Planning Department on the one hand, and the African Affairs committee meetings on the other between 1950 and 1961. According to the Dar es Salaam District Officer who served from 1956 to 1960, Dick Eberlie, the DCs “served the rapidly growing African population that lived in high-density housing in the teeming suburbs around the city centre ... fostering welfare and democracy at the local level.” Despite serving the urban Africans, DCs had little or no contact with the Municipal Council or its technical officers.<sup>92</sup> Hence, most of the

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<sup>90</sup> See copies of these Ordinances and the correspondences on enactment of the Tanganyika Drainage Ordinance in *Ibid.*

<sup>91</sup> Letter from G. Henderson from Public Works Department to Director of Medical Services dated 7<sup>th</sup> May 1952 in TNA, 450/649/1: Drainage Ordinance.

<sup>92</sup> Richard F. Eberlie, *District Officer in Tanganyika: The Memoirs of Dick Eberlie* (London: Bluemoon, 2015), 3-4.

infrastructure projects conceived by the DCs were implemented in the city by the PWD as central government projects. At the conception of the projects, the central government planned to build roads with anticipation that “the Municipality would be responsible for improvements and maintenance.”<sup>93</sup> However, the position of the council was that the builders should maintain and repair roads. This situation continued to the first decade of independence. For instance, it was reported in the 1962 annual report of the Ministry for Communications, Power and Works (formerly PWD) that the City Council had refused “to accept responsibility for a number of streets which were constructed to a high standard of carriageway but without street lighting.”<sup>94</sup> These streets were built with bitumen following the DC’s recommendation.

The Town Planning annual reports released between 1950 and 1965 contained recommendations of what should have been done in infrastructural development after submitting its various planning schemes for Dar es Salaam. In the 1951 annual report, for instance, the Survey and Town Planning Department called for the “deliberate construction of roads, bridges, railway sidings, open spaces, industrial areas and other skeletal features of the town” to implement the 1949 Master Plan.<sup>95</sup> In the implementation of the plan, it appears that, in Zone I, Zone II and the commercial and industrial zones, the skeletal features of the town – including drainage – were installed in advance or concurrently with the development of the zones. Thus, by 1961, the two zones had the necessary infrastructure. In Zone III, however, surveyed plots were frequently provided to Africans in the absence of basic infrastructure. In the minutes of the executive meeting which was chaired by the Provincial Commissioner for Eastern Province and which was held on 17<sup>th</sup> January 1952, the lack or poor provision of drainage infrastructure and traffic infrastructure was raised. The minutes showed that there were “appalling conditions in Kinondoni where plots had been allocated to Africans before any provision had been made for roads, surface drainage or water.”<sup>96</sup> While this scenario presents to us the deliberate splintering of drainage infrastructure and traffic infrastructure, one needs to know that there were also institutional weaknesses that contributed not only to exacerbating the situation but even to circulating and appropriating the technical systems across the city.

The institutional weakness referred to here were explicitly stated in the Town Planning Unit reports from 1950 to 1965. One is that, from its inception, the Town Planning Unit had insufficient staff to carry out its planning activities effectively. Hence, the quality of their many planning

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<sup>93</sup> Memorandum No. 36 for Standing Committee: Road in New Development Areas – Dar es Salaam, 20<sup>th</sup> March 1950.

<sup>94</sup> Republic of Tanganyika (RT), *Annual Report for Public Works Division 1962* (Dar es Salaam: The Government Printer, 1963), 2.

<sup>95</sup> Tanganyika Territory, *Annual Report of the Survey and Town Planning Department 1951* (Dar es Salaam: The Government Printer, 1952), 15.

<sup>96</sup> TNA, 41949: Health and Sanitary Measures – Municipality Dar es Salaam

schemes was significantly compromised. The second weakness, which is connected to the first, was lack of civil engineering experts attached to Town Planning Unit. The engineers were supposed to undertake engineering surveys for providing infrastructure. Without such surveys, the planners predicted failure or intricacy in installing the basic infrastructure based on their planning knowledge alone. This ambivalence was stated boldly in the 1965 report which stated that planning layouts “should be followed by careful engineering investigations and designing, demarcation on the ground, construction of drainage, roads, water supply, and electricity and finally the disposal sites for potential developers.”<sup>97</sup> In PWD reports there is no statement that indicates that engineers consulted urban planners during the implementation of several schemes. This means that even the engineers did not see the importance of working collaboratively with the urban planners, although they were working on the same urban materiality. This suggests that professional sciences such as engineering and urban planning imparted working cultures that did not embrace multi-disciplinarity.

The institutional weakness stated above has not been addressed in the post-colonial Town Planning Department of Tanzania since in the whole department there are no civil engineers. It is only in the district, municipal and city councils that the planners and civil engineers break the national and professional boundaries in making plans for their areas. But still, it appears that urban planners have the final say in the final production of the city plans. The post-colonial national boundaries seem to have colonial roots. In a memo dated 6<sup>th</sup> December 1951, a Member for Social Services, for instance, commenting on the sanitary measures in Dar es Salaam Municipality said that “town planning Dar es Salaam inaccuracies occurred because through lack of staff and time it was not possible to check on the ground what had been put down on paper.” He went on to argue that “the functions of the town planners cease after the plans has been made.”<sup>98</sup> This means that the 1949 Master Plan discussed below was not implemented well and completely. One example is the reduction of road junctions in the Kariakoo area which was never implemented.

The institutional and working cultures of the planners and civil engineers were not the only hurdles towards sustainable and best implementation of the plans for Dar es Salaam. Archival records indicate that the views and perceptions of the political administrators also contributed to shaping the infrastructure materiality, especially in terms of distribution and design. The power of political decision-makers over technocrats in urban governance is significantly great and, as post-colonial Dar es Salaam will show in the subsequent chapters, has persisted to the present. The situation got worse when the decision-makers from different institutions had different whims. For

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<sup>97</sup> United Republic of Tanzania (URT), *Annual Report of the Town Planning Division 1965* (Dar es Salaam: The Government Printer, 1967), 2.

<sup>98</sup> TNA, 41949.

instance, in a memo dated 17<sup>th</sup> May 1952 from the Commissioner for Development, W L Rolleston to M D W, it was insinuated that the Dar es Salaam Municipality Authority had found out that surface drainage (which are now spread all over the city outside the old Zones I and II) were not desirable in the municipality. However, this position was objected to by the Chief Secretary (CG) as he thought surface drainage was desirable and that it would “be possible to provide for this in a small way.”<sup>99</sup> The CG also differed with the municipality’s recommendation to introduce a water-borne drainage system in the African zones. He said that:

The proposal for a water carried sewerage system seems entirely out of place. From the point of view of territorial priority, Magomeni’s turn for sewerage system might come up in fifty years. It is not irrelevant to point out that in the Temeke/Chang’ombe area the Municipality concentrated building of houses by Africans with no form of sanitation whatever. The cost of installing water carried sewerage is hardly worth estimating. Unless this condition can be waived the scheme might as well be abandoned straight away.<sup>100</sup>

The above objection to water-born drainage made all the African areas drainage concerns to be about storm-water surface drainage. The reasons for their establishment were, according to the planners, the need to drain the sites so that they were habitable, to drain the roads to protect their foundations and to drain breeding places for mosquitoes.<sup>101</sup> This view highlighted the spatial and technical connection between the drainage infrastructure and traffic infrastructure discussed in this work. The same CG who argued that installing water-borne drainage in the African areas was expensive endorsed the expansion of the same system into the Asian and European areas. The Upanga area had its water-borne drainage installed as part of implementing the 1949 Master Plan.<sup>102</sup> The European area of Oyster Bay, in which the 1949 Master Plan and the 1929 Oyster Bay planning scheme considered impossible to install a water-borne drainage system owing to its hard rock surface, had the system extended in 1952.<sup>103</sup> Other areas like Acacia Avenue and Burton Street in the bazaar had piped storm-water drainage, which was installed as early as 1951.<sup>104</sup> As will also be shown in the discussion of the 1949 Master Plan, the views and implementation of urban infrastructure projects were not only splintering such systems as drainage and roads but also hybridising them. For instance, the appeal for open-surface drainage was implemented in the same

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<sup>99</sup> TNA, 32575/2: African Housing Schemes – Magomeni.

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

<sup>101</sup> *Ibid.*

<sup>102</sup> See the recommendation of this scheme in the Tanganyika, *Plan for Dar es Salaam*.

<sup>103</sup> Tanganyika Territory, *Annual Report of the Public Works Department 1952* (Dar es Salaam: The Government Printer, 1953), 8.

<sup>104</sup> Tanganyika Territory, *Annual Report of the Public Works Department 1951* (Dar es Salaam: The Government Printer, 1952), 6.

city, where there was also piped drainage, consequently producing a hybridised and splintered drainage system.

As we have seen above, infrastructure projects in the last decade of colonial control were conceived by either by the central government through the DC and senior executive officials or by the Municipal Council. A large number of projects that were conceived by the central government were largely implemented than those which were conceived by municipality or by the urban planners. Contrary to the practice in the Global North, where modern urban governance circulated from, this scenario informs us that colonialism created the superimposition of central government decisions on the municipal governments. Such superimposition, coupled with limited municipal revenue resources, has contributed in rendering municipal authorities powerless and, at certain times, useless. What is worthy pointing out at this point is that post-colonial Tanzania inherited the superimposition tendencies. This was uncovered in the Three-Year Development Plan of Tanganyika of 1961-1964 and the First Five-Year Development Plan of Tanzania of 1964-1969, which temporally fall within the analytical framework deployed in this chapter.

The Three-Year Development Plan was a national development arrangement conceived to cater for the colonial-postcolonial transition period. It was produced using reports prepared by the World Bank Mission to Tanganyika in 1960 and the economic surveys conducted by the government itself. As a transitional plan, it had fundamentally more continuity than change. This is to say that it suggested more reforms than transformations by, for example, calling for increased enrolment of secondary school and university students, increasing expenditure in the provision of urban infrastructural services. The plan noted that Tanganyika had a favourable balance of trade that had been strong since 1954; and the balance of trade was reliant on agricultural production by 80% and on mineral extraction by 13%. According to the plan, “the expatriate officers form at present the backbone of all technical services of the Government on which the fulfilment of the development plan depends.” Hence, the plan recommended a slow rate of ‘Africanising’ the civil service so that the implementation of the plan could not be affected.<sup>105</sup> In 1962, the *Sunday News* carried a story about expatriate engineers leaving the Ministry of Agriculture, while knowing that there were no local replacements and that the responsible Minister had beseeched them to remain in their posts.<sup>106</sup> One of the issues that were considered important, apart from education and Africanisation of the civil service, was expansion of the tiny industrial base by increasing the number of import substitution industries (ISIs). Most of these ISIs were to be established in major

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<sup>105</sup> Tanganyika Territory, *Development Plan for Tanganyika 1961/62 – 1963/64* (Dar es Salaam: The Government Printer, 1961), 1-2; this position was supported by MPs like Mr. H.E. Sarwatt (Mbulu) who warned the government of the dangers of fast-tracking ‘Africanisation’ without training Tanzanians in large numbers and best education. See “Not Enough Qualified Staff, Argues M.P.” *Sunday News*, 18.02.1962.

<sup>106</sup> *Sunday News*, 18.02.1962.

urban centres. To achieve this objective, MP H E Sarwatt recommended that technical education at Dar es Salaam should also be provided on a part-time basis so that it could produce immediate manpower for the industries.<sup>107</sup> As such, urbanisation and technology were considered the necessary for industrialisation.

Nationally, the urban sector was given more consideration than the rural sector. This is because most of the schools and educational projects were in urban areas, particularly in Dar es Salaam. Infrastructure developments were also more pronounced in urban areas. The asymmetrical investments underscore the fact that urbanisation was increasing its impact and significance on national development, despite the fact that less than 10% of about 8.5 million Tanganyikans were living in urban areas by 1961. All issues related to urban infrastructures were made solely under the Ministry of Lands and Surveys which among other things was entrusted “to promote township development by constructing roads, railway sidings, drains, and similar services on public land, particularly on public land planned for industrial development and land planned or already developed for high density housing.”<sup>108</sup> However, owing to financial difficulties, as reported in the plan, the Ministry for Lands and Survey had to sign an agreement with the local authorities for providing roads in high-density areas.<sup>109</sup> Reading the urban concerns in the Three-Year Development Plan keenly, one discovers that it sought to give more attention to the African zones. The plan avoided using the racially connoted labels such as ‘African’ or ‘Zone’ as the government was no longer colonial. Instead, it adopted objective planning terms such as high-density areas, which were first appropriated in the 1949 Master Plan for Dar es Salaam. Apart from the general urban bias through investments in education, industries and infrastructure, very little can be said about Dar es Salaam. But one can learn from the water supply, for instance, that, since the Eastern Province (of which Dar es Salaam was a part) had been allocated £113,060 and the other provinces had been allocated less than £71,000, Dar es Salaam had the lion’s share of the funds. Evidence that shows that it had the lion’s share is that, between 1961 and 1964, the central government was working to find a fifth source of water, which was the lower River Ruvu.

In the First Five-Year Development Plan of 1964-1969, the government indicated its intention to transform the economy, housing, urban infrastructure and rural development. Construction, public utilities, transport and communications were expected to outgrow the other sectors of the economy by realising at least 33% of growth between 1962 and 1970.<sup>110</sup> The other projected growth

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<sup>107</sup> *Ibid.*

<sup>108</sup> Tanganyika Territory, *Development Plan for Tanganyika*, 86.

<sup>109</sup> *Ibid.*, 87.

<sup>110</sup> RT, *First Five-Year Development Plan of Tanganyika, July 1964 to June 1969* (Dar es Salaam: Ministry of Development Planning, 1964), 14.



issue in economy was the increase in ISIs. Many industries were to be established during the period of implementing the plan. One reason for ISIs was said to be the reduction of trade imbalance between Tanganyika and its East Africa colleagues.<sup>111</sup> To achieve this goal, certain industries were given priorities such as textile, oil refinery, cement and agricultural implement industries. A centre for industrial development was also established within the Ministry for Industry, Mines and Power supported by the UN Special Fund.<sup>112</sup> The measure was to survey, allocate areas for expanding the industrial estates and zones throughout Tanzania. The modern Ubungo and Makuburi industrial estates in Dar es Salaam with their rail extension were surveyed and established as part of implementing the plan.<sup>113</sup> By 1965, industrial construction and infrastructural development had begun.<sup>114</sup> Although in the first Five-Year Development Plan industrialisation was a national project, most industries were opened in the capital, Dar es Salaam. This triggered the development of plans to expand the boundaries of the city, expansions whose discussion also ensued in 1965.<sup>115</sup> Records from the Central Zone Archives in Dodoma reveal that, in January 1967, the Ministry for Local Government and Regional Administration approved the city boundary expansions, whose implementation started effectively in January 1968. A large chunk of rural Mzizima District was merged with Dar es Salaam City.<sup>116</sup> Hence, Mzizima District had to ‘undergo’ a natural death as a district.

In relation to housing and urban infrastructure, the government took two measures. The first was transferring urban issues from the Ministry of Lands and Survey to the Ministry of Local Government. Hence, issues related to urban roads and drainage were under local government. Second, the government founded the National Housing Corporation (NHC) responsible for urban housing projects. The implication of this responsibility clustering was that the establishment, expansion and maintenance of the drainage infrastructure and traffic infrastructure was also divided between the two institutions. In other words, the infrastructural services were being splintered, both qualitatively and quantitatively. NHC made sure that its estates had all infrastructure services like roads, electricity, water and septic tanks. A few of NHC estates like Kariakoo were connected to the piped drainage system. It should, however, be borne in mind that the initiatives to connect Kariakoo to the piped drainage had begun as early as 1962 by the combined efforts of the City Council and the central government.<sup>117</sup> NHC estates like those in Dar es Salaam were the best

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<sup>111</sup> *Ibid.*, 21.

<sup>112</sup> *Ibid.*, 45.

<sup>113</sup> URT, *Annual Report of the Town Planning Division 1964* (Dar es Salaam: The Government Printer, 1965), 4, 8.

<sup>114</sup> URT, *Annual Report of the Town Planning Division 1965* (Dar es Salaam: The Government Printer, 1967), 4.

<sup>115</sup> *Ibid.* 5;

<sup>116</sup> Letter from Director of Local Government (Urban) to PS for Ministry of Local Government dated 19<sup>th</sup> January, 1967 in CZNA LG81510 Part II: Dar es Salaam City Council: Boundaries and Layout.

<sup>117</sup> CZNA, LAPF 78/1: City Engineer’s Report to Highways and Works Committee 19<sup>th</sup> December, 1962, 657.

planned and matched or overtook the colonial housing schemes. In contrast, the Ministry for Local Government offered infrastructural services in collaboration with, or separately from, the urban councils. They served areas which were not under NHC and most of which were unplanned. Nowadays, the areas are referred to as informal settlements. Not all infrastructural services were provided. Hence, if one were to visit Dar es Salaam City today, one would see the said qualitative and quantitative difference caused by the post-colonial splintering of urban infrastructure. This splintering continued even when the government adopted Ujamaa – an African version of socialism – in February 1967. The two institutions, by virtue of their responsibilities, became the media for circulating and appropriating urban technologies. In roofing, for instance, NHC was offering loans for urban house roofing thus encouraging the rapid transition from thatch roofing to iron corrugated sheet roofing.<sup>118</sup> This was contrary to the use of tiles for roofing, something that had been encouraged during colonialism.

As was the case in the colonial *Ten-Year Development Plan* and the early post-colonial *Three-Year Development Plan*, Dar es Salaam fared well in the *First Five-Year Development Plan*, unlike all other urban centres in Tanzania in relation to the infrastructural budget and development. The plan, for instance, shows that, out of £3,348,000 for supplying water in urban areas in the entire county, £1,634,000 was for Dar es Salaam alone.<sup>119</sup> Like water, drainage and roads had separate plans for the five-year period. Sewerage infrastructure and storm-water infrastructure were allocated £2 million under the Ministry for Local Government.<sup>120</sup> The objective was to improve urban sanitation. £52,000 was set aside for building of roads and a drainage system, and for routine maintenance in the high-density areas. Despite its little amount, the roads and drainage fund were divided to the Ministry for Local Government and Ministry for Lands, Settlements and Water.<sup>121</sup> Furthermore, about £100,000 was set by the Central Government as a standby basket loan to urban councils that would seek to improve their sewerage schemes. NHC was also ordered to set aside a similar amount for the same function.<sup>122</sup> It is not known how much Dar es Salaam borrowed from the central government for building roads and a drainage system from the countrywide funds. But evidence shows that, in 1966, the City Council's treasurer complained about the lack of funds for sewerage and road construction during the visit to the City Hall by the Minister for Local Government.<sup>123</sup> Another record indicates that the City Council requested a loan

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<sup>118</sup> URT, *First Five-Year Development Plan*, 84.

<sup>119</sup> *Ibid.*, 56.

<sup>120</sup> *Ibid.*, 83.

<sup>121</sup> *Ibid.*, 84.

<sup>122</sup> *Ibid.*, 85-86.

<sup>123</sup> CZNA, LG.81410: Dar es Salaam City Council: General.

of about £33,300 from for sewerage and maternity clinic construction in 1968.<sup>124</sup> When the City Council of Dar es Salaam was split in three municipals in 2001, the Director of Local Government ordered the municipal directors to discuss how they would share the burden of unpaid loans of the City it had before its split up.<sup>125</sup> Thus, it is very likely that most of the funds that had been set aside as loans and for building roads and drainage systems nationally ended up being spent in Dar es Salaam.

The general assessment of the development plans from 1947 to 1968 from the dimension of the large technical systems in Dar es Salaam is that the plans played an instrumental role in transforming rapidly the urban materiality. The transformation was dependent on the actions of the imperial, national and local actors who were involved in discussing and planning infrastructural development such as those from the Colonial Office in London, the Governor of Tanganyika and the actors from the government departments and ministries. Dar es Salaam, unlike any other place in Tanganyika, was favoured because of its capital status. While in the colonial days the objective was to develop splintered but technologically representative infrastructure, in the early post-colonial days infrastructure was developed as part of the industrialisation and housing provision with hybridity emerging as the main feature. Despite the presence of plans, the motivations and factors for infrastructure construction were different between the late colonial and early post-colonial periods. In the post-colonial era, some industrial zones such as Ubungu and Makuburi had separate drainage systems from the rest of city. Hence, the industrial sector was not only a motivation for building a drainage system but also for splintering the provision of infrastructure. The same applied to housing provision by NHC and in industrial workers' residential projects and roads. As a result, by the end 1968, Dar es Salaam had achieved more materiality transformations within the last two decades than had been the case in the previous six decades of colonial rule.

#### **4.4 The 1949 Dar es Salaam Master Plan Examined**

In 1947, the government of Tanganyika commissioned Sir Alexander Gibb and Partners to prepare three things: the Dar es Salaam Master Plan, the Mtwara Port Plan and the organisational structure of the Town Planning Department for the whole territory.<sup>126</sup> By May 1948, the Executive Council of Tanganyika – comparable to a modern-day cabinet composed of the President and ministers – had at its disposal the draft master plan for Dar es Salaam waiting for approval before the final plan could start being implemented in the new government year.<sup>127</sup> During the British

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<sup>124</sup> CZNA, LGLB 58: Loan to Dar es Salaam City Council.

<sup>125</sup> CZNA, RALG/U.20/12 Vol.II: Dar es Salaam City Council.

<sup>126</sup> Allen Armstrong, "Colonial and Neocolonial Urban Planning: Three Generations of Master Plans for Dar es Salaam, Tanzania" *Utafiti* 8, no. 1 (1986), 44; Tanganyika, *Plan for Dar es Salaam: Report*, 19.

<sup>127</sup> Tanganyika, *Plan for Dar es Salaam*, 143.

colonial era, the government and financial year was following the normal calendar year. Hence, the implementation of the 1949 Master Plan for Dar es Salaam was set to be effective from 1<sup>st</sup> January 1949, a date when Dar es Salaam also became a municipality. This became a decisive turning point in urban planning and development in modern-day Mainland Tanzania. It marked the beginning of controlled urban design and growth with the plans playing a great instrumental role in urban development.

The master plan for Dar es Salaam had six main technical concerns to address. These were surface utilisation, the condition of buildings, services, community plans, populations and planning studies. These concerns were technical as they were at the level of abstraction. It is this level of abstraction that has been critiqued by the urban geographer Allen Armstrong for being too esoteric because such abstractions can only be discerned by urban planners.<sup>128</sup> For the purposes of ‘implementing’ as conceived by the central government of Tanganyika and for the lay reader, the plan had three objectives: the first was a comprehensive spatial use and control in which the concern was about setting specific areas for government structures, commercial activities, residential purposes, offensive and inoffensive industrial areas and areas for general public use. The second objective was to provide social and infrastructural services. In that case, the main concern was about the design and distribution of such services as health facilities, educational facilities, street roads and highways, piped and well water, electricity distribution and sanitation services which, in this plan, appear to have incorporated septic tanks, a piped sewage system, a piped storm-water system and open drainage. The last objective was to have a street layout and housing design according to each zone. It is in this case that the comments on reorganising the Asian (Zone II) and African (Zone III) areas were made to create open spaces in streets so as to have fresh air and to reduce road junctions. The suggested open spaces, unlike the one that had existed since the mid-1920s, embraced progressive ideas about urban spatial utilisation. It sought to introduce places akin to parks and gardens where people would do some recreational activities. New settlement areas were also suggested and incorporated into the plan to reduce overcrowding in the two areas mentioned above. The planning schemes such as the Magogoni, Kurasini and Kinondoni planning schemes for urban Africans for creating was what was labelled the ‘boys’ towns; and the Upanga scheme for Asians were some of the measures to reduce overcrowding in the municipality.<sup>129</sup> While such schemes were executed, the open spaces were not established, something that has persisted in the post-colonial plans of Dar es Salaam and other areas in Tanzania.

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<sup>128</sup> Armstrong, “Colonial and Neocolonial Urban Planning,” 45.

<sup>129</sup> Tanganyika, *Plan for Dar es Salaam*, 36-46; The *Tanganyika Standard* of 15.01.1949 had an article on the first reading in the Tanganyika Legislative Council (LEGICO) of the bill “Planning Scheme for Upanga Area”.

In the original plan the duration of its implementation was not specified. Instead, the estimated population growth was a key determinant in the long-term plan implementation. Prepared using the population census of 1948, which showed that Dar es Salaam had about 69,000 people,<sup>130</sup> the plan was to serve its full capacity when the population reached 200,000 inhabitants.<sup>131</sup> Sources that have commented on this plan and its plan writers do not explain explicitly the rationale behind the use of population figures in projecting the implementation of the plan. Nor do they explain why the figure was very low and static. It is possible that the planners had not envisioned situations that would have catapulted population dynamics. Against the temporal infinite and limited population growth projections, the population of Dar es Salaam had doubled in 1957 when it reached 129,000 people. It grew to 272,000 people in 1967.<sup>132</sup> The sharp population increase was caused by things such as the burgeoning industrial base in the municipality after 1949 and after the independence of Tanganyika.

Crafted by the British planners who believed that “introduction of western civilization naturally brought about an abrupt change in the life of Dar es Salaam’s native population” only and who also sought to amend the failures of the early German plans for the city;<sup>133</sup> the plan became the ideological tool in the immediate post-WWII contexts. It sought to inculcate to the urbanites the British post-war progressive ideology as well as to justify the Colonial Development and Welfare Act of 1940, a reaction to the German interwar propaganda. In other words, the plan was not a value free entity. In another facet, the plan was crafted to instil a sense of modernity to Africans, albeit the fact that the Africans were not the only denizens of Dar es Salaam. If we take a leaf from the modernity discourse analysis by Jan-Gorge Deutsch discussed in the previous sections of this chapter, we could say that this was modernity by contagion. Furthermore, the plan sought to critique the failure of the German plans to build an efficient sanitation and drainage system in the city, particularly in the Asian commercial-cum-residential area. Beyond the planners’ self-declared crusade, in practice the plan cemented the class and racial divisions between the city inhabitants created by the British. Ignoring or discarding the racially imbued terms such as Zone I, Zone II and Zone III, the plan adopted and advocated typical technical planning terms, namely high density, medium density and low density. In contemporary Britain and Europe, the terms had class connotations. In Tanganyika they carried both class and racial meanings. This became clear when the plan defined the land use in the city. The high-density areas were to be inhabited by the

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<sup>130</sup> URT, *National Capital Master Plan – Dar es Salaam: Technical Supplement No.4: Economic Valuation* (Ontario: Project Planning Associates Limited, 1968), 9.

<sup>131</sup> Tanganyika, *Plan for Dar es Salaam*, 26.

<sup>132</sup> URT, *National Capital Master Plan*.

<sup>133</sup> Tanganyika, *Plan for Dar es Salaam*, 13-14.

Africans, the low-density areas were to be inhabited by the Europeans and a few rich Indians and the medium-density areas were to be inhabited exclusively by the Asians. The open space between the Asians and Africans created by the British as a *cordon sanitaire* remained intact.<sup>134</sup>

Moreover, the class and racial impact of the plan was evident in the recommendations regarding housing designs, infrastructure provision and surveying of the areas under new planning schemes. The surveyed plots in the African zones were to have 10 to 12 houses per acre, in contrast to four to six houses in the Asian zones and one to two in the European zones. In the African zones, the traditional building materials, namely mud and wattle for walls, were retained, while coconut tree leaves which were used for roofing were replaced by tin sheets. In the planners' words, the Africans "only needed the tiles to render them permanently" because in their traditional designs they were "clean and tidy semi-permanent housing."<sup>135</sup> This paternalism on African building materials was only limited to the areas where housing units were built under self-help schemes, for example in Kariakoo and Kinondoni. Such a building tradition continued to dominate the city's self-built houses to the early 1990s. These houses adopted geometrical designs in which the main house had four to six rooms, separated from the common latrine and kitchen that were built in the rear of the main house. The planners did not inquire into the difficulty of getting other building materials like cement and tiles at affordable prices given the global post-WWII shortage of building materials which had caused material rationing in Britain. Neglecting this important motivation for continued use of semi-permanent house building materials, the planners resorted to cultural conclusions that "without doubt the African likes a detached house."<sup>136</sup> The houses were built in areas with poor infrastructural services. For instance, with the exception of dirty street roads, they were not connected to electricity, the water supply and the sewage system throughout the late colonial period.

It was in the new housing schemes for African "boys" that a consideration to provide infrastructure was given paramount importance.<sup>137</sup> The housing for the "boys" was funded by the government to alleviate housing shortages in the city. The main target was the African government workers who were predominantly male; thus, no wonder that in the plan and in other colonial records they appear as "boys". Undeniably, the colonial government employed more men than women because they were the ones who migrated to Dar es Salaam more easily than women due to patriarchal nature of Tanzanian hinterland communities. Additionally, most of the colonial officials – not only in Tanganyika but also in other colonies – were also predominantly white males;

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<sup>134</sup> Tanganyika, *Plan for Dar es Salaam*, 29-85.

<sup>135</sup> *Ibid.*, 50.

<sup>136</sup> *Ibid.*

<sup>137</sup> *Ibid.*, 39.

thus, the local and global British colonial empire was patriarchal.<sup>138</sup> The “boys” houses were to be built in surveyed areas close to their places of work. The areas that were built under these schemes for the Africans were Temeke, Ilala, Magomeni and Kinondoni, while Chang’ombe was built for the Asian government workers. The main building materials used in all cases were cement bricks, wood and tiles. The houses were small and semi-detached with only a single sleeping room and a sitting room in which the “boys” would live with their families. Limiting the number of rooms was made under the assumption that African males had no families in the city and that they were temporary urban inhabitants. With respect to kitchen and toilet separation, they appropriated from the traditionally-built houses of Kariakoo whose designs had such a separation. Street roads were paved and the streets had single water kiosks, street taps or wells. Unlike the Asian and European streets, the “boys” housing units were not connected to the electricity system. The master plan did not say anything regarding the electrification of the African zones. This silence illustrates the continuity of processes of splintering urbanism between the interwar and post-war periods.

The housing for the European and Asian workers was qualitatively different from that for the African ones. The plan shows that not only were the two groups to settle in the low- and medium-density areas as indicated above but also they were to be well furnished with both social and public utilities. It is interesting to note that the British were willing to let rich Asians live in the zones which had initially been designated for Europeans. It is written in the master plan that this was because of “the non-official recognition of the Indians as fellow members of the Empire.”<sup>139</sup> When the Upanga area planning scheme for Asian housing was being finalised, there were plans to connect it to the networked infrastructure for sanitation, water supply, roads and electricity. By the end of colonial rule in 1961, Upanga was the second-best furnished area in terms of infrastructural development. This can be identified in most of the maps and colonial reports that portrayed the progress of Dar es Salaam. Some of the reports include the reports that the provincial commissioners for the Eastern Province and the Governor of Tanganyika were writing annually to the Governor and the United Nations, respectively.

The other indicator of the 1949 Master Plan being racial was its maintenance of the *cordon sanitaire* that separated the African Kariakoo and Asian Mnazi Mmoja areas. The planners understood that the area was created after the demolition of African houses<sup>140</sup> by the British in the mid-1920s, and that it had been an open space since then. The planners complained about the lack of open and school spaces in the African area of Kariakoo. They also suggested the demolition of

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<sup>138</sup> To grasp further on the gendered nature of British colonial empire see Andrew Porter ed., *The Oxford History of the British Empire: The Nineteenth Century* (Oxford: Oxford University Press, 1999).

<sup>139</sup> Tanganyika, *Plan for Dar es Salaam*, 15.

<sup>140</sup> *Ibid.*, 16.

some houses and structures to provide for more ventilation. However, they did not suggest changing the nearby *cordon sanitaire* for African use. Instead, they argued for its preservation in order to maintain racial separation through space. This signifies that planners also adopt values when planning. In that case, they appropriated spatial zoning and its racial morality. In the post-colonial era, the area became an open ground for public functions and several public structures like towers and hospitals have been built in some parts of the area.



**Figure 4.3:** A Water Fountain Built in the Former *Cordon Sanitaire* in 1962  
*Source:* PWD *Annual Report* (1963).

When it came to traffic and drainage, the recommendations made by the planners, just as was the case for other kinds of infrastructure called for the merger of the organisational cultures of institutions and technical professionals. This was evident in the final plan because they consulted technical professionals not only of drainage and roads but also of electricity and water supply. The planners had to consult various experts, since they sought to produce a comprehensive master plan. In the plan, drainage is treated as a public utility. As a result, one line of discussion on roads in the plan is embedded within zoning or land-use issues.<sup>141</sup> The other line categorizes traffic infrastructure as a component of the larger field of communication which include such other technical systems as telephones, telegraphs and postal services.<sup>142</sup> Thus, it is evident that the implementation of the plan in relation to drainage and traffic infrastructure was going to be affected

<sup>141</sup> See for instance in Tanganyika, *Plan for Dar es Salaam*, 73-85.

<sup>142</sup> *Ibid.*, 88-112.



because the two technical systems were fundamentally understood as being two unrelated technologies. This argument will be substantiated in the subsequent sections and chapters.

Four issues were identified in the plan in relation to traffic infrastructure. The first is the road system. The plan identified the existence of highways and street roads. By 1949 when the plan was made, the highways were the roads heading upcountry from the city centre, where there was a port and a railway terminal. There were three highways since the German era, namely Kilwa Road heading to the south, Pugu Road heading to the southwest and Bagamoyo Road heading to the north. The planners were aware of the plans to construct a new highway towards Morogoro town across a new planned African settlement of Magomeni. The road was constructed in the 1950s and came to be known as Morogoro Road, a name that is still in use today. The development of this road was meant to reduce distance between Dar es Salaam and Morogoro and to facilitate the famous groundnut scheme which was launched in the Central Province of the Tanganyika Territory.<sup>143</sup> The development of transport infrastructure was limited to only roads. The port and railway terminals of Dar es Salaam were also improved so they could match the increasing volume of groundnut export under the directive of the Colonial Office in London.<sup>144</sup>

The street roads were seen as vital to the mobility of motor vehicles in the city. Although generally all were roads, regardless of the racial zone in which they were, more attention in terms of maintenance was given to the roads in the commercial and government zones, as well as to those in the European and Asian residential areas than to the roads in the African zones. In the plan, road safety appears to have been a concern for all the areas. In the commercial zone, the planners recommended constructing roundabouts in several road junctions “so that traffic can be controlled and accidents be minimized.”<sup>145</sup> In the African area of Kariakoo, they suggested re-planning the area in order to abate what they considered as many road crossings that had certain safety implications for people and vehicles.<sup>146</sup> As a result, safety from road accidents was the second issue, which was given due consideration in the planning of roads.

The third issue related to design. Design issues are technical issues. Road width, the number of lanes, the use of the road space for other kinds of infrastructure like drainage, water supply and electricity and footpaths were all quintessential elements in the design of traffic infrastructure. With regard to the width of the highways and most street roads, the planners advised the 60 feet width

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<sup>143</sup> See the funding and beginning of construction of Morogoro Road in Tanganyika in BNA, CO822/592 Colonial Development and Welfare Projects for Road Construction in Tanganyika, 1951-1953.

<sup>144</sup> BNA, CO967/58 East Africa: Long Term Transport Problems in East and Central Africa, and Port Facilities at Dar es Salaam.

<sup>145</sup> *Tanganyika, Plan for Dar es Salaam*, 92.

<sup>146</sup> See in *Ibid.*, 55-57.

instead of 10 feet width<sup>147</sup> Improving road width was also said to be instrumental in increasing the mobility of vehicles and in reducing accidents. This recommendation was made despite the fact that it affected the commercial zone, which was already heavily built, which implied that some of the buildings would be demolished.<sup>148</sup> The other suggestion which attracted opposition from building owners was that of creating a footpath in the ground floors of commercial storey buildings. The rationale for this recommendation was the need to provide shade to customers. It appears that this recommendation was implemented in storey buildings that were built from the 1950s onwards in the commercial area and has influenced architectural designs of most commercial houses even in the other streets.

The spatial interdependence between roads and other kind of infrastructure is a dominant characteristic in all planned cities in the world. The 1949 Master Plan also showed this feature. In what was known as Acacia Avenue, the planners suggested increased road space in order for building power and drainage infrastructures.<sup>149</sup> They also proposed that future roads should have space for other kinds of infrastructure. They drew road cross-sections to show the kind of designs they suggested. See the illustrations below.



**Figure 4.4:** A Street Road and a Storey Building with a Footpath  
**Source:** *Tanganyika Territory, Plan for Dar es Salaam, 1949.*

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<sup>147</sup> Tanganyika, *Plan for Dar es Salaam*, 84.

<sup>148</sup> *Ibid.*, 85.

<sup>149</sup> *Ibid.*, 96.

Equally important in relation to roads was storm-water drainage infrastructure. The planners noted that, during the rainy season, Dar es Salaam was separated from the rest of country by floods. The situation was worse between March and May.<sup>150</sup> There was no comment about a long-term solution to the impact of storm water on roads, especially in the city centre. The only comment that was made regarding the road-drainage intersection was on roads built in sloppy landscapes. The comment incorporated the issue of health as it sought to reduce breeding places for mosquitoes. It stated that “roads constructed on the contours can canalize the surface water run-off and assist considerably in reducing ponding which occurs in low lying areas.”<sup>151</sup> It follows that even the drain designs incorporated into the few road cross-sections were aimed at reducing ponding to combat malaria. Although Dar es Salaam had endemic malaria, the conception of road drains in relation to malaria signified that there was continuity in thinking among the technical decision makers from the German to British colonial period. It is argued here that anti-malarial drainage, or rather, a hygienic-drainage perspective, influenced in diverting engineering and planning experts working in Dar es Salaam from focusing on flooding drainage (which is an aspect of storm-water drainage) to destroying breeding places for mosquitoes. This is because the hygienic drainage did not cover every kind of traffic infrastructure nor was it capable of reducing the intensity of storm water. It is not surprising that there were unending complaints in the annual reports of several government departments such as the PWD or in the newspapers. And as will be discussed in the subsequent chapters, the legacy of that technical lacuna persisted until the post-colonial era.

The fourth issue in relation to the plan was about urban public transport for Dar es Salaam. It is important to note that, from the beginning of German control of Dar es Salaam to 1949, the roads in the city – highways and street roads – used to serve the rickshaws, bicycles and the few motor vehicles belonging to European and Asian farmers, merchants and government employees. The British, unlike the German, colonial authority also owned a large fleet of vehicles. Up to the making of the 1949 Master Plan, wheel transport in Dar es Salaam was an exclusive monopoly of the few rich Asians and Europeans – a corollary of the racial and class colonial relations. A few Africans used wheel transport as drivers or as other kinds of employees like mechanics. This means that the Africans who formed a huge labour force had to rely on their feet for mobility. They also carried their goods on their heads to and from the market places just as porters in the 19<sup>th</sup> century caravan trade had done.<sup>152</sup> With further expansion of the city boundaries, which meant sending

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<sup>150</sup> Tanganyika, *Plan for Dar es Salaam*, 88.

<sup>151</sup> *Ibid.*, 149.

<sup>152</sup> P H C Clarke, *A Short History of Tanganyika: A Mainland of Tanzania* (Arusha: Longmans, 1966), 107.

Africans far away from the centre where they worked, the planners and employers thought of introducing public transport. Inadvertently, the colonial authority sought to remove the six decade-long feature of Dar es Salaam as a 'walking city'.<sup>153</sup> Africans would become the main users of the proposed public transport. It was out of the discussions between the central government and the planners that a private company was invited to provide bus transport as the city's majority mode of transport. In the plan, it is indicated that the private company – Dar es Salaam Motor Transport (DMT) – had already been established, but was not operating.

It has been reported that there was an ongoing discussion between the Municipality Council, DMT and the quasi-Town Planning Department (which was composed of the developers of 1949 Dar es Salaam Plan and one government employee) over where bus stops should be located.<sup>154</sup>

The fact that the roads in the city did not have any bus stops means that the road engineers who worked from the late 19<sup>th</sup> century to 1949 had not envisaged the advent of public transport in the city. Records from the British National Archives (BNA) indicate that Dar es Salaam had the best urban roads in Tanganyika. A survey of township roads in the Eastern Province in 1936, for instance, indicated that, out of 81 township roads in the whole province, 61 roads were in Dar es Salaam, of which 33 were macadamised and 28 were earth roads.<sup>155</sup> In those days, the phrase 'metalled road' was used to refer to a macadamized or tarmacked road. Metalled roads were built in the city centre, where the government and commercial districts were located. The African areas, where more than 80% of the city inhabitants lived, had dirty roads. The macadamisation of roads in the early colonial period and in 19<sup>th</sup>-century Global North capitals was considered as one of the symbols of modernity and progress in the streets.<sup>156</sup> Hence, the splintering of urban infrastructure occurred not only in its distribution but also in its design. As such, the colonial world was a scene of dual modernity. This dual modernity seeped into the master plan of the city as the recommendations to improve the critical traffic infrastructure focused on the government, European and Asian areas at the expense of the African areas.

The plan precluded different traffic experiences in the city, experiences eponymous and familiar to individuals travelling from modern Dar es Salaam periphery to the city centre. The plan and other sources are silent on African voices on the need for macadamized roads throughout the colonial period. That means that it is hard to document their experiences in the absence of oral sources or correspondences between the Africans and the colonial authorities. Such experiences would require another project. When the bus transport service began, it mainly covered the old

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<sup>153</sup> Joel A. Tarr, "The City and Technology" in *A Companion to American Technology* edited by C. Pursell (New York, NY: Blackwell Publishing, 2005): 97-112.

<sup>154</sup> Tanganyika, *Plan for Dar es Salaam*, 112.

<sup>155</sup> BNA, CO691/147/4: Road Development – Tanganyika.

<sup>156</sup> Marshall Berman, *All That is Solid Melts into Air: The Experience of Modernity* (New York: Penguin, 1988), 155-164.

and newly established African settlements on the one hand, and the city centre on the other. This is because the main employers were the Government, Europeans and Asians found in the city centre, whereas the Africans were the main employees of the former group that resided in the margins and periphery of the city. One of the areas which were covered by DMT services was Ilala, as depicted in Figure 4.5 below.

Apart from the traffic infrastructure, the drainage system of Dar es Salaam was also presented in a short section of the plan. But before going into detail, it is important that we understand the different ways in which the planners used the term ‘drainage’. The planners used the term ‘drainage’ to denote the removal of two types of waste liquids that are technically intertwined. The first type was about all human or household-generated waste water. In this sense, they used the phrase “foul drainage”<sup>157</sup> to denote the waste water that is internally produced as a result of bodily metabolism and social reproduction activities. In most other colonial, post-colonial and technical literature, foul drainage is treated under the terms ‘sewerage and sanitation’. The second type was related to storm<sup>158</sup> or run-off water that is externally produced by rainfall. Storm water is treated as drainage by scholars who consider drainage per se has having nothing to do with sewage. This distinction, although the planners did not describe it explicitly, is vital because it helps us to understand the use of the term drainage in various sections of the plan.

In the 1949 Master Plan drainage is part of public utilities. This means that the colonial authorities were responsible for its provision. By the time of writing the plan, there was a “dire need for adequate drainage facilities in Dar es Salaam.”<sup>159</sup> The planners noted that the city had “pipe borne foul drainage” which was limited to the central area and which discharged sewage into the port bay. This means that a large part of the city had no conduit removal of sewage. As a result, most of “foul drainage” was “carried out by means of septic tanks.”<sup>160</sup> Although the planners also showed the existence of a storm-water sewer, which was built in the central area, it seems that they were actually describing the same pipe-born drainage. In other words, the piped born drainage had a dual function of draining the central area in the city of its sewage and storm water. The planners also indicated the existence of surface drainage in the city. The latter drained storm water through open dirty ditches and open concrete-lined channels.

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<sup>157</sup>*Tanganyika, Plan for Dar es Salaam*, 148

<sup>158</sup>*Ibid.*

<sup>159</sup>*Ibid.*, 149.

<sup>160</sup>*Ibid.*, 148.



**Figure 4.5:** DMT Buses at the Official Inauguration of Public Transport in Dar es Salaam in May 1949  
*Source: Information and Press, URT.*

Furthermore, the design and functional dimensions overlapped in the city's drainage. Septic tanks and what has been referred to as foul pipe drainage were underground or closed drainage designs whose main function was to remove human liquid waste. Septic tanks were built in some parts of the central area and in the European Oyster Bay suburb as the latter area had a hard-rocky surface. The evidence retrieved from the archival research done in Tanzania shows that sewage waste from septic tanks was emptied by hand pumps and damped into the sea from the mid-1920s to about 1948.<sup>161</sup> This service was not available in the African zones because they used pit latrines. Pit latrines are not discussed in the drainage section of the plan. In other sections they are not discussed, but are only mentioned in passing, twice at least. But the plan does not emphasise the importance of a drainage system in the Kariakoo African suburb. This might be regarded as being a theoretical splintering of the drainage system in Dar es Salaam. The foul pipe drainage was also used to remove storm water from the houses and streets connected to the piped drainage. This is what is referred to as the combined drainage system in the Global North cities.<sup>162</sup> Surface drainage

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<sup>161</sup> TNA, 20339: Cess Emptying Services in Dar es Salaam.

<sup>162</sup> See David Butter & John W. Davies, *Urban Drainage*. 2<sup>nd</sup> Edition. (London & New York: Spon Press, 2004).

was for removing storm water from streets and houses. The other purpose, a critical purpose since the German colonial era, of surface drainage was draining stagnant water to prevent the emergence of breeding grounds for mosquitoes.

The design and functional overlap of the drainage system meant that the drainage system required the engineering skills of malariologists and drainage engineers. The planners noted this overlap to the extent they had to consult both drainage engineers and malariologists when preparing the scheme.<sup>163</sup> It is interesting that planners attempted to seek professional knowledge from the right experts when preparing the plan for Dar es Salaam. While at face value this was the right move, it had fundamental consequences during the implementation of the plan. The consultation was not for breaking or recommending combining the organisational cultures of malariologists and traditional drainage engineers. Malariology was a medical profession that developed in the Global South within the colonial contexts. Combatting malaria by identifying areas that are highly risky, prevention measures like limiting mosquito breeding by drainage, oiling and fumigation, malariologists were keen at designing some engineering interventions by drawing plans and practical advice. Since typical medical experts were not good at doing engineering work, they needed engineers who had rudimentary medical knowledge or experience with sanitary engineering. In the interwar period, for instance, the government is reported to have hired a special engineer to develop anti-malarial drainage. The anti-malaria engineer was isolated from the PWD, a body that controlled all engineering activities.

The discussions about the autonomous status of this engineer ensued in 1927 and were rescinded in 1929 through the appointment of an engineer who could be attached to the PWD. This was shown in a letter from Sir Donald Cameron to the Secretary of State L C M S Amery, in which the Governor said, “I have the honour to report that the Director of Public Works now considers that it is preferable to obtain the services of additional Executive Engineer with experience in drainage and water schemes, whose services could be utilised on such works when necessary and who could be employed at other times on general work, rather than a trained Sanitary Engineer whose duties would be solely confined to such works.”<sup>164</sup> Therefore, when the 1949 Master Plan was being prepared, it was the medical personnel with rudimentary engineering skills and the above engineers who were consulted.

As the evidence shows, the consultation was for developing separate drainage projects that would need isolated engineering planning, isolated implementation and separate budgets. This isolation was rooted in the function of each drainage design proposed by the malariologists and

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<sup>163</sup> Tanganyika, *Plan for Dar es Salaam*, 148-149.

<sup>164</sup> TNA, 450/46/8: Sanitary Engineer.

drainage engineers. In the plan it is indicated that the planners agreed with the malariologists in relation to the need to build storm-water drainage before developing land for settlement purposes. Similarly, they took malariologists' suggestion to "canalise surface water run-off and assist considerably in reducing ponding" on roads and in low-lying areas.<sup>165</sup> On the other hand, the drainage engineers they consulted were the ones who dealt mainly with the combined sewage system. They dealt with sewage and storm-water design, construction, treatment, discharge and maintenance. Unlike the malariologists, their objective was not to combat malaria. Despite their differences, they were using similar engineering skills in implementing the projects as they were constructing water-related waste control systems. They ended up constructing two different systems that could have been combined. It is this failure, resulting from contextual engineering reasons – malarial and drainage engineering – that the planners and decision makers in the government could have dealt with. It is not clear why the planners failed to combine such organisational and engineering practices, given the fact that they were civil engineers by profession. One may, however, hypothesise that the planners were influenced by the local situation and circumstances as well as the malarial and drainage engineering practices that were circulating within the British colonial empire. In British Guiana, for instance, it is reported in the colonial records that as early as the 1920s there were separate engineering projects related to flood drainage and anti-malarial control.<sup>166</sup> A similar scenario was noted in Kampala, which was under the British in the 1930s.<sup>167</sup> Although the development of malarial engineering could be regarded as an innovation in colonial engineering, it was an innovation that split engineering planning, designing, construction and maintenance cultures. It made same engineers work twice, doing more or less the same task. It made the colonial medical and public works departments set two different plans and budgets for implementing related engineering works, consequently giving more financial distress to the government. Thus, a more significant and rational innovation would have been the one that considered malarial and drainage engineering as a single engineering project.

If the planners had noted this, they would have revolutionised colonial engineering in theory and practice. The drainage system in Dar es Salaam would have been the testing ground for the new engineering practice. Moreover, the drainage system would have broken the splintering of the drainage system which was taking place in Dar es Salaam as a result of racial zoning. This is because the European and Asian zones that previously had malarial and combined sewage drainage would have got a single drainage system. The areas would have been combined also with the African zones that were only serviced by the anti-malarial drainage. In that way, drainage

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<sup>165</sup> Tanganyika, *Plan for Dar es Salaam*, 149.

<sup>166</sup> BNA, CO111/650/34: Drainage Schemes – British Guiana.

<sup>167</sup> BNA, CO536/182/18: Drainage Development Schemes: Sewerage and Storm Water of Kampala and Jinja.



technology would have transformed the built environment in Dar es Salaam by adding a ubiquitous drainage system to it.

As the plan was being prepared in 1948, there were already plans to develop a long-term water supply; the water would be provided through a piped network. The planners state that they provided the central government with a separate water supply plan. In the plan they simply mentioned that the River Ruvu would offer the city a permanent water supply.<sup>168</sup> This indicates that the planners, just as the 19<sup>th</sup> century British sanitary movement, understood that adequate and clean water was necessary for a successful, combined sewage system. It also indicates that the interchangeable use of the concepts of ‘drainage’ and ‘sanitation’ was appropriated from the same sanitary movement.<sup>169</sup> What is surprising is that the planners for Dar es Salaam did not seem to appreciate the interconnectedness of engineering, planning and organisation as was the case with their British counterparts. Planners’ horizons seem to have lacked interconnectedness even within the same infrastructure, as has been shown with respect to malaria and combined sewage drainage systems. It is argued here that such circumstances contributed to the technical and social splintering of drainage infrastructure in Dar es Salaam.

#### 4.5 Conclusion

Investment in the traffic and drainage infrastructure in the period under discussion offers us many lessons. The first is that there was overlap in the implementation of plans, between the development plans and the 1949 master plan for Dar es Salaam. The colonial and post-colonial states were determined to implement the development plans rather than the master plan. This is because most of the plans for infrastructural development from the main plans were implemented, but only a few sections of the master plan were implemented. For instance, the extension of piped drainage to Kariakoo – which was a high-density area – as per the recommendation of the master plan was not implemented throughout the colonial period. But when the same issue was inserted in the 1964-1969 development plan it was implemented. This overlap made the city roads and drainage systems ‘undergo’ splintering and hybridity as they were built in heterogeneous quality, and had differential distribution. It made the city lack uniformity in materiality.

The second issue is about organisational and technical splintering. In Dar es Salaam infrastructure was, as has been shown, was the responsibility of many institutions. We saw above that the central government built and maintained drainage systems and roads in the industrial zones through its Ministry for Industries, Mines and Power. In high-density areas, the same infrastructure

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<sup>168</sup> Tanganyika, *Plan for Dar es Salaam*, 147.

<sup>169</sup> Michelle Allen-Emerson, *Sanitary Reform in Victorian Britain: Sanitary Engineering*. Vol. 3 (London: Pickering & Chatto, 2012).

was the responsibility of the Ministry for Local Government. In the NHC estates the same infrastructure was the responsibility of NHC. And in some areas, the same infrastructure was the responsibility of the City Council and the Ministry of Lands. These institutions had separate funds. They implemented their projects in isolation. They had different technical capacities. Most of their activities were thus technically and organisationally splintered; hence, the provision of infrastructure was also resulting in splintering and hybridity. Hence, if they were improving and modernising the condition of the city, ultimately leading to a patchy city modernity. And a historian seeking to understand the materiality resulting from that nature will not get a connected story, but rather a story that is formed by hodgepodge developments.

The third issue is that during the late colonial era, most of the drainage and road construction projects were implemented by the PWD or any select consulting engineer. For example, the contract for expanding the drainage system for Dar es Salaam was given to Messrs Howard Humphreys & Co between 1950 and 1958. Some of the roads in the city and upcountry were built by Sir Alexander Gibb and Partners, who also produced the 1949 Master Plan for Dar es Salaam.<sup>170</sup> The PWD reports include other projects that it undertook such as some of the roads in the city and the main water supply from the River Ruvu. In the early post-colonial era, the engineering projects were implemented by the PWD or private companies such the United Construction Co and Mwananchi Engineering Construction Company (MECCO). The private companies with such names started featuring in government records from the mid-1960s onwards.

Fourthly, the records show that during the rainy season communication by means of road transport was affected. It is surprising to see that neither the urban planners nor the engineering personnel recommended a comprehensive solution. This becomes evident when one examines the drainage system for Dar es Salaam as it has had fewer storm-water drains and more sewerage drains in the city centre. It also had fewer sections that manifested the existence of a combined drainage system. In some cases, suggestions from the Municipal Council to build a combined drainage system were rejected by the central government. The persistence of different designs of the drainage system was anchored on the splintering and hybridisation of drainage infrastructure consequently, rendering solutions to the recurring storm-water problems ineffective.

Finally, the splintering, hybridisation and organisation the provision of infrastructure in Dar es Salaam City during the colonial-postcolonial transitional period offers further questions on the governance and materiality of infrastructure. We suggest analysing them using the splintered urbanism as it embodies issues of technological circulation and appropriation in the Global South.

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<sup>170</sup> A Memo from R Orde Browne to Mr Scott and Mr Rogers dated 05.02.1953 in BNA CO 822/611: C.D. &W. Projects for Road Construction in Tanganyika.

We have shown in this chapter that urban planning and engineering ideas, knowledge, practices and materiality were circulating not only between the metropolitan and national cities, but also between the local and global centres. Hence, there were mutual technological exchange and contestations within the colonial and post-colonial dialectics.

## CHAPTER V

### THE AGE OF THE DRAINAGE AND TRAFFIC ABYSS: PLANNING ON PAPER WITHOUT IMPLEMENTATION

This chapter attempts to reconstruct the consolidation of postcolonial infrastructure regime in the period from 1968 to 1999. It also attempts to reconstruct the infrastructure resulting from the urban governance disturbances caused by national politics and dynamics of the global economy. This period is important in the history of technological and infrastructural development in Tanzania for two main reasons. First, it was during this period that almost all the towns in Tanzania developed their first master plans. We label the period ‘the age of urban planning’. Through urban planning, many towns acquired uniformity in the provision and construction of infrastructure. Secondly, this was the period when the country underwent major socio-economic and political changes. The most notable change was the transformation from the capitalist development ideology to the *Ujamaa* development ideology. *Ujamaa* was the Tanzanian variant of socialism that drew inspirations from certain, African, traditional, egalitarian values. On the technological front, *Ujamaa* embraced labour-intensive technologies at the expense of capital-intensive construction and production technologies. There were changes that were accompanied by this national transition. Among the many changes was the change from the ‘colonial networked’ ideal, which provided infrastructural services in splintered form, to the ‘universal networked’ ideal, whose core principle was the provision of infrastructure to all. However, the new infrastructure ideal was translated into all the large technical systems, except for drainage. In drainage, the colonial pattern persisted and this chapter explains why that was the case.

The chapter begins the reconstruction in question by analysing the post-colonial national development plans, looking especially at their impact on the drainage and traffic infrastructure in Dar es Salaam. The chapter also discusses the spatial master plans and their connection to infrastructural development. In addition, it examines the legacy of *Ujamaa* in the area of urban development in Dar es Salaam, using the prism of urban technologies. The chapter also provides an account of the national economic crisis and shows how the crisis became the final setback in technological development in the city. The chapter concludes by arguing that social and political arrangements, particularly the decentralisation of local authorities’ governance, the shift of the national capital from Dar es Salaam to Dodoma in 1973 and the continued inability of the City Council to mobilise local funds and personnel for Dar es Salaam all worked against the planning, engineering, implementation, repair and maintenance of the traffic and drainage systems. With

respect to drainage, for instance, it is argued that the situation contributed to the maintenance of the design and functional hybridity that had evolved in the colonial and early post-colonial era. It is also shown, however, that there was asymmetrical development in the role that the drainage infrastructure played in the post-colonial era: drainage increasingly became associated with flood control at the expense of disease control; this can be interpreted as a pragmatic divergence between the design functions of the Global North and the realities in the Global South.

## **5.1 Wishes versus Reality: Development Planning and Urbanisation**

### *5.1.1 Continuity of Colonial Structural Bottlenecks*

The period from 1968 to 1978 can be described as the decade of immense changes in the development trajectory of Tanzania. There were significant socio-economic developments which were the brainchild of the independent state. Some of them are the transition from a market economy to a centrally-planned economy under the guidance of the *Ujamaa* ideology. *Ujamaa* was a form of African socialism that advocated egalitarian values among people, in both the rural and urban areas.<sup>1</sup> In the rural areas, it meant living and producing communally. Being largely influenced by the rural bias, the urban context meant that *Ujamaa* would be lived less in practice and more in theory as the people there could work and live without upholding egalitarian values. This is to say that the urban dweller, as long as he was working, enjoyed unfettered freedom in using the product of his labour. Other kinds of development that occurred in this period included a substantial growth of import substitution industries (ISIs). The ISIs, most of which textile industries, were situated in the urban centres throughout the country under the Three-Year and Five-Year Development Plans.<sup>2</sup> This is to say that the rural areas produced raw agricultural goods, while the urban areas produced industrial goods. Under this direction Tanzania was made a country of farmers and workers; farmers lived in the rural areas and workers lived in the urban areas. Since *Ujamaa* emphasised self-reliance, the country had to create a self-reliant economy whose rural and urban community were interdependent.

As we saw in the previous chapter, the predominance of the industrial sector in the urban areas had certain implications for urbanisation. The country sought to undergo urbanisation through expansion of the industrial sector. Implicitly, the state turned all non-industrial areas into rural areas. It is perhaps because of this move that many scholars of urbanisation in Tanzania, particularly those focusing on Dar es Salaam, have concluded that the state development policies

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<sup>1</sup> Edwin Mtei, *From Goatherd to Governor: The Autobiography* (Dar es Salaam: Mkuki na Nyota Publishers, 2009), 106-109; Joseph Kulwa Kahama, *Sir George: A Thematic History of Tanzania through His Fifty Years of Public Service* (Beijing: Foreign Languages Press, 2010) 43-48.

<sup>2</sup> Kahama, *Sir George*, 36.

were against urban development.<sup>3</sup> Their conclusions are based on the fact that rural development received more funding than urban development, and on the fact that the state was constantly undertaking “*nguvukazi* operations” [sic] to remove all kinds of vagrant and unemployed people from urban areas and take them to the rural production areas instead.<sup>4</sup> Pro-rural policies also drew motivation from the first President of Tanzania – Julius Nyerere – who stated in his speech on inaugurating the Second Five-Year Plan that the policy of his government would emphasise rural development at the expense of the urban sector.<sup>5</sup> Although this position can be challenged, if one takes into account the master plans for the towns and municipalities developed between 1967 and 1979, the disparity in the infrastructure investment between the rural and urban areas and the massive rural-urban migration in the 1980s, it is not my intention to do so at this juncture. Instead, the main focus is on showing how post-colonial urbanisation unfolded in relation to the industrial sector, state machinery and other actors.

The result of the chosen urban development path was the emergence of housing schemes, cultural activities like sport and music as well as transport facilities for the industries and their employees. As such, the best infrastructure for providing services like water, electricity and sanitation could be found in the industrial-residential areas than in the other areas occupied by other urbanites. The industrial-residential areas competed with those under the National Housing Corporation (NHC). NHC is a state corporation that was founded under the Ministry of Health so that it could provide housing and infrastructural services in planned estates across Tanzania. Most of NHC estates were in Dar es Salaam. The large penultimate outcome of building best infrastructure in industrial-residential areas and NHC estates was splintered urbanity because the quality of infrastructural services resonated with the quality of the services offered in gated communities in the Global North and elsewhere in the Global South. In Dar es Salaam, for instance, the residences of the workers of Urafiki Textile Mills had better roads, water and sanitation, and electricity services than those in the adjacent high-density residential areas of Manzese and Mabibo. It could be argued that the government’s seriousness in the industrial areas and NHC estates ‘sabotaged’ the capacity of the City Council to serve the high-density, unplanned

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<sup>3</sup> B. Calas ed., *From Dar es Salaam to Bongoland: Urban Mutations in Tanzania* (Dar es Salaam: Mkuki na Nyota Publishers, 2007), 6.

<sup>4</sup> Cf. Mohamed Ahmed Saleh, “Zanzibari Investments in Kariakoo” in *From Dar es Salaam to Bongoland* edited by B. Calas, 373; Emily Callaci, *Street Archives and City Life: Popular Intellectuals in Postcolonial Tanzania* (Durham: Duke University Press, 2017), 196; *Africa Contemporary Record: Annual Survey and Documents 1983-1984* (New York and London: Africana Publishing Company, 1985), B276. ‘Ngunvukazi’ is a Swahili word which means strong work. As campaign, ‘Ngunvukazi operations’ were launched in 1983 after the Parliament passed the Human Resources Deployment Act in order to discipline workers and peasants to increase productivity during the ongoing economic crisis. It was the Act that was used to control vagrancy and unemployment in urban areas especially Dar es Salaam.

<sup>5</sup> United Republic of Tanzania (URT), *Second Five-Year Plan for Economic and Social Development, 1<sup>st</sup> July, 1969 – 30<sup>th</sup> June, 1974*. Vol. 1. (Dar es Salaam: The Government Printer, 1969), xvii-xviii.

residential areas. This intentional sabotage was endorsed by President Nyerere because he believed that NHC-developed areas would be instrumental in “diverting suitable new factories and employment opportunities to selected towns.” Consequently, the city had three cacophonous motifs – the industrial, NHC and unplanned areas – which predicated the basic urban infrastructure provisions. This feature was an indispensable modernity evil, according to Nyerere, because of the need to build self-sustaining urban centres and to boost the national economy. To make it intelligible, Nyerere remarked:

For example, in a town where there are 5000 workers employed, there is a ready market of about 25,000 people, all of whom need to buy food, clothes, and other consumer goods. Their presence justifies expenditure on building, let us say, a modern bakery, a small plant for making cooking pots, and so on—each of which will employ more people. And the fact that roads, water supplies, power supplies, etc., have already been provided for some factories makes it convenient to site new factories in the same place.<sup>6</sup>

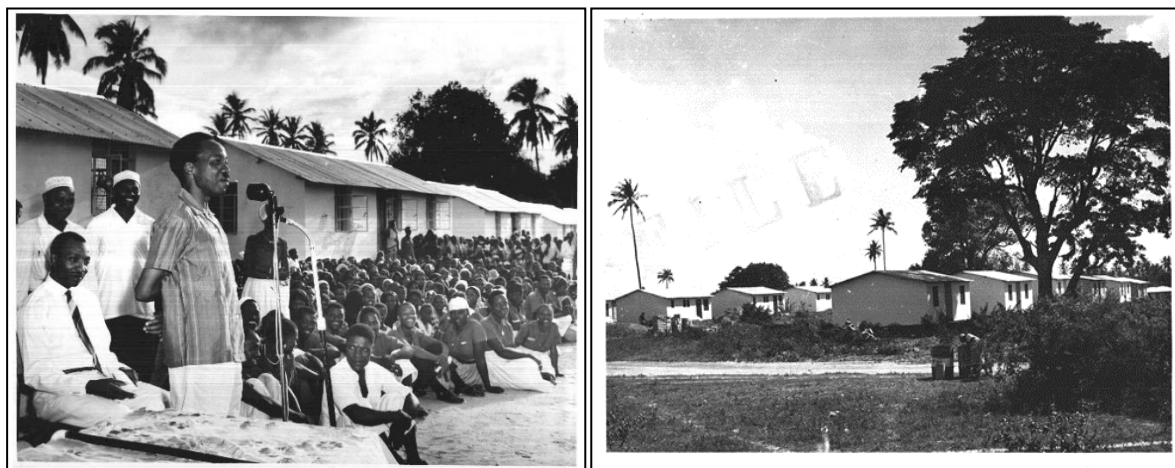
Between 1967 and 1978, there were a series of correspondences between the central government and the City Council, and within the Council itself. The correspondences show the extent to which the provision and development of infrastructure in Dar es Salaam was extremely dependent on the central government. The dependence varied from the government endorsing the development projects designed and approved by the City Council to providing funds, employees, expertise and loans to the Council. Most of the correspondences involved the Director of Local Government (DLG), who was responsible for urban governance in the Ministry for Regional Administration and Local Government (RALG). In a memorandum dated 10 October 1973, for instance, the DLG wrote to the Permanent Secretary (PS) in the Prime Minister’s Office, saying that, since 1970, the central government had not provided the City Council with funds for implementing most of the capital development projects, including funds for constructing the Kinondoni market.<sup>7</sup> This indicates the extent to which the state sabotaged the City Council and other urban authorities which, by default, were serving the residents in the unplanned settlements. The government was, instead, investing heavily in NHC and the industrial areas in the provision of urban infrastructure as the pictures below show (see Figure 5.1). As such, the independence of Tanganyika did not fundamentally change the infrastructural pattern inherited from the colonialists. Whereas in the colonial era, infrastructural services were provided along class and racial lines, in socialist Dar es Salaam the services were largely provided along the lines of NHC and industrial significance. The change was only in rhetoric, through its emphasis on the provision of infrastructural services for all.

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<sup>6</sup> URT, Second Five-Year Plan, xviii.

<sup>7</sup> CZNA, G.81410 IV: D’Salaam City Council: General

Similar financial concerns and complaints over funds for implementing projects in the city were many in the exchanges between the central government officials themselves, and between the city officials and the central government ones. In 1971, for instance, there were several exchanges between the City Treasurer and the City Clerk on the shortage of funds for building infrastructure and implementing other projects.<sup>8</sup> First, in June 1971 the City Treasurer notified the City Clerk of the impending city liquidity. Three months later, the City Treasurer wrote another letter to the City Clerk grousing about the shortage of funds. The treasurer wrote that “the Dar es Salaam City Council has now reached a stage where it will be difficult to undertake any sizeable capital projects due to (sic) general lack of development finance.” The treasurer revealed that the revenues of the Council had not increased since 1965 and that there were many duties of the Council that had not been paid for. The treasurer also stated that “the Government has decided to withhold all (sic) grants payable under Section 29 of Cap. 105 for all purchases of public health vehicles” and “the relevant ministries refused to pay their share of the capital cost of roads even (sic) those already constructed.” He concluded his letter by suggesting freezing all the capital projects for the following three years as the City had run out of funds.<sup>9</sup> The City Council’s financial difficulties affected even non-capital activities such as paying the gardeners who were cutting grass in the city gardens and on the roads.<sup>10</sup>



**Figure 5.1:** President Nyerere inaugurates NHC houses at Magomeni in the late 1960s.  
*Source: Press and Information (Maelezo), Dar es Salaam, Tanzania.*

The City Clerk was the intermediary in the correspondences between the City Council and the central government. He was, by default, responsible for relaying information on the City Council’s deficit to the central government through the DLG. The correspondence presented

<sup>8</sup> Letter from the City Treasurer to the City Clerk dated 16.06.1971 in CZNA, LG.82910/72: Dar es Salaam City Council: Estimates

<sup>9</sup> Letter from the City Treasurer to the City Clerk dated 03.09.1971 in *ibid.*

<sup>10</sup> Letter from the City Clerk to the DLG dated 05.12.1972 in *ibid.*



above between the DLG and the PS in the Prime Minister's Office on the bankruptcy of the City Council indicates that, although the central government had learnt of the Council's deficit, it did not intervene in reducing financial deficit for almost half a decade. The intervention was only rhetorical as the letter from the DLG to the City Clerk of 1972 showed when the former warned the City to be careful with financial expenditure and estimations to avert any financial misuse as the government did not have any funds. It should also be noted that certain projects in the city such as road and drainage projects were under the central government, and, therefore, the Council could not build, maintain or repair them, apart from discussing them during the Council's meetings and sessions. As a result, most drains and roads in the city were not maintained for a long time. Some of the roads in the city were not maintained and repaired because the volume of the traffic that used them was small. In fact, the volume of traffic was not the only reason for not repairing the roads. The absence of experienced and qualified road engineers, funds and equipment were also a never-ending bottleneck.<sup>11</sup>

The City Council's budgetary constraints, jurisdictional limitations and the inability of the relevant ministries to build, maintain and repair infrastructure in the city meant that the large technical systems in Dar es Salaam were in grave conditions in the late 1960s and 1970s. Most of the roads were in run-down condition. The drains were not maintained so that they could withstand the bad condition wrought by tropical rains. The flooding of roads during the rainy season in the 1970s prompted the ruling party newspaper to publish a cartoon with a caption that represented the roads as water streams. The cartoon (see Figure 5.2.) satirically presents people's thinking on the problem and the solutions they were contemplating. The cartoon shows people's ingenuity and resilience over road floods as well as resignation over the City Council's inability and unwillingness to mitigate stormwater drainage problem. Acknowledging the presence of the road problems and the financial difficulties, the City Council advised the central government to use "Swepeco" tarmac instead of the undefined tarmac which was being used. This tarmac was not described in detail; instead, it was only pointed out that it was not resistant to storm water as such water could penetrate into the sub-grades of a road. "Swepeco" tarmac, used on one unmentioned road in 1969, was said to be able to protect roads from storm water and heat permanently.<sup>12</sup> The retrieved sources do not indicate the company that solicited the testing of "Swepeco" tarmac or its producers. Nor do they indicate if the government acted on the suggestion made swiftly or later as there was no response in the archives. The "Swepeco" tarmac story provides some glimpse into situation in which local

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<sup>11</sup> Majadiliano ya Bunge (Hansard): Taarifa Rasmi (Tanzania), 13-21 December, 1966 Sitting, 103; Parliamentary Debates: National Assembly Official Report (Tanzania), 18-21 February, 1964 Sitting, 73.

<sup>12</sup> Letter from the City Clerk to the PS in the Prime Minister's Office dated 06.08.1972 in CZNA, LG.82910/72: Dar es Salaam City Council: Estimates

governments proposed modernising and innovative solutions to the central government during the *Ujamaa* period.



**Figure 5.2:** Walking on Stilts: Dar es Salaam Roads during the Rainy Season and People’s Creativity  
*Source: Uhuru 19.05.1973*

### 5.1.2 National Development Plans and Dar es Salaam’s Infrastructure

In the period from 1968 and 1999, Tanzania had three national development plans which were a continuation of the post-war colonial development planning model. The superficial difference between them was that the colonial plans covered a period of 10 years, while the post-colonial ones covered a period of five years. According to the government, the fundamental difference between them was that the post-colonial plans sought to “transform” national development in both the urban and rural areas. In the Three-Year Development Plan, Tanzania, then known as Tanganyika, was influenced by “the tradition of British socialism and European social democracy.” As the country was leaning more to China from the mid-1960s onwards, Tanzania was influenced by the Chinese socialist 5-year planning model. “President Nyerere saw the relevance to Tanzania of the Chinese development model.”<sup>13</sup> The transformation approach replaced the colonial improvement approach because the latter was for short-term development, which meant that long-term and

<sup>13</sup> Kahama, *Sir George*, 46-7; 105-6.

sustainable success could not be achieved if that approach was sustained.<sup>14</sup> Through the five-year plans, the state propelled the ship of modernisation in Tanzania by treating the nation as a backward nation that needed to catch up with developed countries to a certain extent. The government was acting on all aspects of its population, despite having meagre resources, both financial and skilled human resources, in a country which is as big as Germany and France combined. Through modernisation from above, emphasis was placed on increasing the productivity of the rural and urban areas. In the rural areas, transformation meant mechanising farming and adopting other modern farming technologies. In the urban areas, transformation was translated into industrialisation under the assumption that the country would develop faster with a sound industrial sector. As such, the people had to be either workers in the factories, the civil and service sector in the urban areas or farmers in the rural areas. Historian Emily Callaci shows how women in post-colonial urban Tanzania took lowly paid jobs in most of the newly-established factories thus becoming “significant symbolically than demographically in the creation of urban vision.”<sup>15</sup>

The infrastructure in all the urban councils in Tanzania was also considered in the plans. Priority was on the water supply, sanitation, roads and power. As shown in Chapter IV, the government planned to loan urban authorities funds for implementing sewerage schemes. NHC was also asked to set aside the same amount of money for its estates. The money for implementing urban infrastructure projects would be disbursed through the Ministry of Local Government, because it was the custodian of all local authorities. In the First Five-Year Plan, for instance, the government set aside £2 million for sewerage as the annual growth needs for sanitation were rising at a rate of 7% a year.<sup>16</sup> The rise in sanitation needs implies that the population in the urban areas, including Dar es Salaam, was growing at a fast rate despite the fact that up to 1988 the rural population constituted about 80% of the country’s total population.<sup>17</sup> As the assessment of the First Five-Year Plan reveals, the drainage of storm water received little attention. The political leaders regarded the management of sewerage as being more pressing than the management of seasonal flooding in the urban areas. They were, however, startled by the possible health dangers like the eruption of water epidemics. This explains why they considered the traffic infrastructure in isolation from the storm-water drainage infrastructure. It also reveals the colonial-postcolonial continuity in the concerns over urban drainage. In particular, the continuity was in separating it

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<sup>14</sup> Republic of Tanganyika, *First Five-Year Development Plan of Tanganyika, July 1964 to June, 1969* (Dar es Salaam: Ministry of Development Planning, 1964), 19.

<sup>15</sup> Callaci, *Street Archives and City Life*, 65.

<sup>16</sup> RT, *First Five-Year Plan*, 83.

<sup>17</sup> URT, *1988 Population and Housing Census Report* (Dar es Salaam: Bureau of Statistics, 1991).

from traffic designs and in giving enormous attention in sewerage at the expense of storm water drainage.

The plans for most infrastructural development in Dar es Salaam and other urban areas in Tanzania which were included in the First Five-Year Development Plan had, by 1969, not been fully implemented. In the general and sincere submission over a review of the performance of the First Five-Year Plan and the inauguration of the Second Five-Year Plan, President Nyerere conceded that:

Whereas the First Plan had detailed lists of projects for the whole five-year period – many of which had to be abandoned – in the (Second) Five-Year Plan we have committed ourselves only to projects which we expect to carry through during the first two years. . . . We thus avoid the extremely slow start we made in 1964 and 1965 when progress was held up because neither the projects nor the implementation procedures had been worked out in advance.<sup>18</sup>

After learning of the failures of the First Five-Year Development Plan in the area of infrastructural development in Dar es Salaam and its projection the city was the “pole” for urban development in Tanzania, in the Second Five-Year Plan, the government planned to invest significantly in the technical systems. The other objective in investing in the urban infrastructure was to lay a foundation for strong industrialisation, which would begin during the implementation of the Third Five-Year Plan, which was set to begin in 1976.<sup>19</sup> Although Dar es Salaam would receive the lion’s share in infrastructural development, the Second Five-Year plan noted that other towns would also have significant infrastructural improvements so that industries would also be established in them to arrest the excessive growth of Dar es Salaam, asymmetrical urban migration and job opportunities.<sup>20</sup> The decision was made after learning that the population of Dar es Salaam was growing very fast, with the estimates indicating that the city would have three million inhabitants by 2000.<sup>21</sup>

According to the Second Five-Year Plan, urban infrastructure was inevitable for industrial and urban activities. In simple terms, Tanzania’s philosophy of urban development was premised on two complementary sectoral interventions – urban and industrial interventions. It is no wonder that most of the large technical systems established far from the urban areas were for ensuring that the urban and industrial sectors functioned smoothly. In that regard, the Second Five-Year Plan had a government’s deliberation to construct the Kidatu hydroelectric power dam, to conduct a feasibility study at Stiegler’s Gorge, to increase the water supply, improve the industrial effluent

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<sup>18</sup> URT, *Second Five-Year Plan for Economic and Social Development, 1<sup>st</sup> July, 1969-30<sup>th</sup> June, 1974*. Vol. I. (Dar es Salaam: the Government Printer, 1969), viii-ix.

<sup>19</sup> URT, *Second Five-Year Plan*, xiii, 179-180.

<sup>20</sup> URT, *Second Five-Year Plan*, 177-178.

<sup>21</sup> *Ibid.*, 177.

disposal and to improve the condition of roads.<sup>22</sup> While industrial effluent and sewerage received requisite attention, storm water drainage in the urban areas did not. Instead the focus was on improving traffic drainage on the highways by controlling storm water in certain problematic areas or removing stagnant water from the highways. Therefore, the plan also influenced the management of urban drainage being through ad hoc actions and solutions. It condemned Dar es Salaam to another five years of seasonal street flooding (see Figure 5.2 above), which made its residents lose confidence in the city's government.

The Third Five-Year Plan was published in 1978 to steer the country towards full-fledged industrialisation.<sup>23</sup> Unlike the Second Five-Year Plan, which included an exclusive chapter on urban issues, the Third Five-Year Plan focused on how the country could achieve its industrialisation goal through long- and short-term plans. Several things emerged. The first was the development of the 1975-1995 industrial plan which gave high priority to the “development of basic industries” and “increasing domestic linkages” for “greater degree of economic self-sufficiency.” The latter plan was, in principle, the initial stage of the Third Five-Year Plan. The industrial plan sought to ensure that Tanzania produced capital goods for its processing and import substitution industries, established during the implementation of the First and Second Five-Year Plans.<sup>24</sup> The second was the decentralisation of industrialisation – the spreading of industrial activities from the urban centres to the districts and villages. Urban industries were categorised as national industries, which would be overseen by the National Development Corporation (NDC). The industries established in the areas outside the major urban centres were to be overseen by the District Development Corporations (DDCs). And finally, the factories which were established at village or street level and which engaged in small-scale production were to be overseen by the Small-scale Industrial Development Organisation (SIDO). NDC, DDCs and SIDO were all state parastatals.<sup>25</sup> This indicates that, in Tanzania, industrialisation was a top-down endeavour that sought to leave no one and no part of the country without some form of industrial production and activity.

The Third Five-Year Plan was published late because it was partly a reaction to the break-up of East African Community I (EAC I). Had EAC I not collapsed, Tanzania would have remained with its long-term industrial plan of 1975-1995. The government think tank believed that with a sound industrial sector broader human development would be achieved since industries

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<sup>22</sup> URT, *Second Five-Year Plan*, Vol. III, 71.

<sup>23</sup> *Africa Contemporary Record: Annual Survey and Documents 1976-1977* (New York and London: Africana Publishing, 1978), B367.

<sup>24</sup> URT, *Third Five-Year Plan for Economic and Social Development, 1<sup>st</sup> July, 1976 – 30<sup>th</sup> June, 1981*. Vol. 1 (Dar es Salaam: The Government Printer, 1978), 43-44.

<sup>25</sup> URT, *Third Five-Year Plan*, 47.

have a trickle-down effect on “agriculture, education, health, water, housing, clothing, or (sic) security of Tanzanians.”<sup>26</sup> What was not said by the officials is that they were translating the president’s dream of achieving fast economic growth through industrialisation as the West had done,<sup>27</sup> a dream which was also shared by the first president of Ghana, Kwame Nkrumah. Unlike many other African statesmen who balked at industrialisation in the early independence years, Nyerere and Nkrumah were unique as they understood very well that it was futile to have “urbanization without industrialisation.”<sup>28</sup> The vision of urbanisation through industrialisation was not captured in most other previous works on the Tanzanian urban history, except narrowly in Emily Callaci’s *Street Archives and City Life*. What unites all other works on urban Dar es Salaam is their uncritical claim that throughout the post-colonial period, the urbanisation of the city was characterised by a conspicuous absence of industrialisation.

As shown above, the government attempted to urbanise the country through industries, attempts which yielded some results in the 1970s when Dar es Salaam was the biggest industrial city in Tanzania. The industrial estates along Pugu Road, Chang’ombe, Mabibo, Ubungo and Mikocheni were all established in the 1970s. Housing flats for the workers of various factories were built together with recreational facilities, sport teams and music bands. Those who lived closer to the factories were used to hearing factory sirens. Factories changed the landscape and social terrain of the city. And when public urban transport underperformed, the public requested that parastatal buses offer transport services because they were assumed to be technically impeccable.<sup>29</sup> By the then standards, the workers of various factories enjoyed better social and infrastructural services than other urban residents—actually second-better after the government bureaucrats who lived in the formerly European residential areas. The importance of the factories in Dar es Salaam were also reflected in the coffers of the state, at least for a decade. John Iliffe, for instance, notes that “[the] proportion of investment devoted to manufacturing trebled during the 1970s.”<sup>30</sup> Rune Skarstein indicates that, between 1973 and 1979, the contribution of manufacturing to the national GDP was relatively high before it slumped, beginning in 1980.<sup>31</sup>

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<sup>26</sup> Jamhuri ya Muungano wa Tanzania (hereafter JMT), *Miaka Mitatu ya Utekelezaji wa Mipango ya Miradi ya Vivanda (1976-1979)* (Dar es Salaam: Wizara ya Viwanda, 1979), 1.

<sup>27</sup> A Scandinavian development economist, citing Cranford Pratt, argued that most of the groundbreaking economic and political decisions in Tanzania were actually made by President Nyerere because of “his unique authority as a political leader.” Other leaders, therefore, were only approving and executing the president’s decisions, including the industrialisation drive. See Rune Skarstein, “Growth and Crisis in Manufacturing Sector” in *Tanzania Crisis and Struggle for Survival* edited by Jannik Boesen et al. (Uppsala: Scandinavia African Studies, 1986), 80.

<sup>28</sup> Ali A. Mazrui, “Towards the Year 2000” in *General History of Africa: Africa since 1935* Vol. VIII edited by Ali A. Mazrui and C. Wondji (California: Heinemann, 1993), 922.

<sup>29</sup> See, for instance, “Mashirika yasadie UDA kuchukua watu” in *Mzalendo*, 11.05.1980. A similar call had been made a year earlier in another paper; see “Let ‘SU’ buses help UDA” in *Daily News*, 16.08.1979.

<sup>30</sup> John Iliffe, *Africans: A History of the Continent* (Cambridge: Cambridge University Press, 1995), 262.

<sup>31</sup> Skarstein, “Manufacturing Sector”, 82.

The First- and Second-Year Development Plans had paid direct attention to the need to improve urban infrastructure. They presented a grasp of the position of Dar es Salaam in the country, its role in industrialisation and its growing population. In reality, however, with the exception of the water, sanitation and power infrastructure, very few roads were built to the required standards. Maintenance and repair were not part of the plans, and that explains why newspapers and the government frequently reported on bad roads in the 1970s and 1980s. The industrial estates and workers' residential areas, on the contrary, enjoyed the best services. This was in direct connection to the Third Five-Year Development Plan. Whereas non-industrial areas were used to storm water flooding and the absence of drainage infrastructure in them, the industrial areas and workers' flats had a different experience. One would say that the Five-Year Development Plan developed a duality in traffic and drainage infrastructure provision in Dar es Salaam, with one part having streets without drainage (even when planned) and another part having streets with drainage systems. On another dimension, the city attained a dual character of urbanisation by having both urbanisation with industrialisation and urbanisation without industrialisation. The latter was bigger from the 1980s onwards and consisted of urbanites in the government civil service, private firms and businesses, and casual labourers.

## **5.2 Modernity on Paper: Spatial Planning and Infrastructure**

Spatial plans have been an important tool of modernisation in most global cities and towns since the 19<sup>th</sup> century. As shown in the previous chapters, spatial plans also found their way into Tanzania as part of colonial modernisation and spatial control. However, only a few towns in Tanzania were planned in the colonial period. These were Tanga, Mtwara and Dar es Salaam. Strategic factors and low population were the reasons for that. Dar es Salaam, the only town to have more than one master plan, was planned because it was the capital and had the largest number of people of all the urban areas in colonial Tanzania. According to the 1948 census, for instance, Dar es Salaam had around 69,227 inhabitants, and Tanga, Tabora and Mwanza had 20,619, 12,768, and 11,296 inhabitants, respectively. No other town had a population of more than 10,000 people.<sup>32</sup> Tanga was planned during the German time because of its strategic importance to the settler enterprises and of the presence of a large European population there. Mtwara was planned in the British era because it was the headquarters of Southern Province with a deep, natural harbour for exporting peanuts to Britain in the post-war period.

There was a quantitative difference in planning urban areas in the postcolonial period. Almost all the regional headquarters saw a significant rise in population, a factor for the spread of

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<sup>32</sup> URT, *The Population of Tanzania: An Analysis of the 1967 Population Census* (Dar es Salaam: Bureau of Statistics), 79-80.

the spatial master planning model in Tanzania. Whereas in 1968 only Dar es Salaam had a master plan, by 1981 there were ten other towns with master plans.<sup>33</sup> This means that the period between 1968 and 1981 was the age of spatial planning using master plans. In 1974, the Ministry of Lands, Housing and Urban Development said that it had taken it a long time to develop the master plans because of an acute shortage of urban planning experts. The country lacked local spatial planners; the Minister admitted this in Parliament.<sup>34</sup> Consequently, the country relied on spatial planners from Canada, Sweden, the USA, Finland and Japan under the national bilateral agreements. The experts were paid by their national governments. Using foreign experts and funding in developing master plans had serious implications for the documents prepared. An urban geographer who assessed the master plans of Dar es Salaam identified “external influence or cultural colonialism” as the most dominant implication.<sup>35</sup> Since his analysis covers also the colonial plans, he can be regarded as embracing the continuity thesis in cultural colonialism through the media of master plans. Cultural colonialism embodied issues of elite bias in spatial order, prestige and aesthetics.<sup>36</sup> Foreign spatial visions dominated and that reflects the local majority not involved in preparing the plans, and socio-economic and geographic conditions were different. The foreigners used the plans as a modernisation tool.

The second implication of the foreign dominance in spatial planning is that the wishes of the local leaders could easily be misinterpreted and changed. It was possible to change them because the independent government of Tanzania lacked well-trained spatial planning professionals. In Chapter VI, it is pointed out that the decision to train such experts locally was made rather late –in the 1980s. Political leaders offered policy statements that stated national visions concerning planned spatial developments. The plans favoured the urban areas. The leaders could not have objected to, and perhaps not noticed, the ideological and technical aspects which were consequential and which were against their instructions. The political scientist Rwekaza Mukandala notes that foreign aid is mysterious because important information is concealed from recipient countries and actors.<sup>37</sup> Under this schematic order, master plans became tools for circulating spatial orders from abroad to Tanzania in lower standards and without local

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<sup>33</sup> The preparations of those master plans were based on the 1967 census reports as indicated in the Town Planning Division: Annual Report 1968.

<sup>34</sup> JMT, *Hotuba ya Waziri wa Ardhi, Nyumba and Maendeleo Mijini: Makadirio ya Fedha 1974/75* (Dar es Salaam: The Government Printer, 1974).

<sup>35</sup> Allen M. Armstrong, “Master Plans of Dar es Salaam, Tanzania”, *Habitat International* 11, no. 2 (1987), 133-145, here at 134.

<sup>36</sup> *Ibid.*, 141.

<sup>37</sup> Rwekaza Mukandala, “From Proud Defiance to Beggary: A Recipient’s Tale” in *Agencies in Foreign Aid: Comparing China, Sweden and the United States in Tanzania* edited by Goran Hyden and Rwekaza Mukandala (Hampshire and London: Macmillan Press, 1999): 31-67, here at 61.



appropriations. As such, spatial plans did not lead to the achievement of the wishes of the recipients. These are the consequences of technical aid.

The third implication is that the plans, because they were developed by foreigners alone, it had serious implication of reliance on foreign materials in infrastructure building especially roads and drainage. As the Minister for Lands had warned in 1974 about reliance on foreign building designers, the country was bound to import expensive building materials, if it wanted to implement what was described in the spatial plans. As per spatial plans, infrastructural development was to achieve various socio-economic and cultural needs of the urban sector. Since Tanzania was economically poor and extremely dependent on foreign aid in the 1960s and 1970s, the lack of funds for importing materials for building infrastructure pre-empted successful execution of the spatial plans. For a successful implementation, the plans should have included local experts during the plan preparations and they should have appropriated local conditions in both, topography and the building materials. Otherwise, the plans would remain on paper without being translated on ground.

#### *5.2.1 The 1968 Dar es Salaam National Capital Master Plan*

Dar es Salaam had its first master plan in 1968. Like other post-colonial plans, it was a plan coordinated from above.<sup>38</sup> The ordinary people were not involved in its preparation or in reaching the decision to prepare it. The planners wanted to give Dar es Salaam a global capital status, since it was the country's capital. As such, they drew inspirations from the planning of other capitals in the world: Ottawa, Washington, Copenhagen, Stockholm, Canberra, Brazilia, Chandigarh and Abidjan.<sup>39</sup> The master plan was thus instrumentalised to circulate global urban modernity. The master plan was officially launched on 1<sup>st</sup> November 1968 by the Minister for Lands, Settlement and Water Development, Mr A M Babu and the Director of Town Planning, Mr R L Sharp. Mr. Sharp was a British national working in the government of Tanzania.

From the perspective of the central government, the objectives of the 1968 master plan were “improving roads, water supply, sewage disposal, housing and getting rid of squatters in the capital within the next 20 years.” It was added that the plan “would avoid the economic and social consequences of unchecked urban growth.”<sup>40</sup> In other words, the plan sought to address three

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<sup>38</sup> On critique of spatial plans coordinated from above see letter from Ministry of Lands, Housing and Urban Development to the Regional Development Directors for Kagera, Mara, Mwanza and Shinyanga dated 12.10.1980 in CZNA PM/VA/8/4: Report of Urban Authority.

<sup>39</sup> United Republic of Tanzania (hereafter URT), *Dar es Salaam National Capital Master Plan*, TS3 (Toronto: Project Planning Associates Limited, 1968), 4.

<sup>40</sup> *The Nationalist*, 02.11.1968. The paper, reflecting what seemed important message to the public, emphasised on the removal of squatting in the city. The news heading read: “Dar Squatter Areas Need Clearing—Plan”. Building houses

critical issues: urban infrastructure, housing and population growth. The provision of housing to alleviate squatting was to be done in the first phase of the plan, that is, 1969-1974. In the original master plan document, the first phase was defined as the short-term period. The other phase was the long-term period, from 1969 to 1989.<sup>41</sup> The construction of new roads in the city to link new industrial estates with the old ones, new residential areas and the port would follow. Noting that the city had about 17,000 vehicles and 40,000 bicycles, Mr Sharp said that half of the workers went to work on foot. With such figures, bus and bicycle transport was envisioned to be the future mobility system. This justified improvement of the traffic infrastructure included in the master plan. While the preparation of the plan was done with Canadian aid, in the first phase its implementation was dependent on funds which had been set aside by the government for the Second Five-Year Development Plan and its total cost was 280,702,000 Tanzania shillings.<sup>42</sup> As the master plan was dependent on the Second Five-Year Development Plan, which was still being prepared and was published in July 1969, its implementation was thus delayed for 9 months for financial reasons.

Three weeks after the master plan was launched, the local government in Dar es Salaam began educating various actors within its ranks on the plan, particularly on its objectives and implementation. Coast regional leaders asked the Canadian expert to elaborate the plan to the region's senior officials. The plan covered parts of Mzizima District in Coast Region. Opening one of elaboration seminars, the Regional Administrative Secretary, Mr E A Erio, said that the master plan was "aimed at curbing the massive flow of people from the rural areas into the city." He added that one of the solutions would be establishing "some industries on the outskirts (sic) of the city, particularly at Ruvu and (sic) the districts close to the capital."<sup>43</sup> Although this suggestion is enticing and attempts to realise it have been made since the second re-introduction of the City Council in 2001, it was not within the scope of the 1968 master plan. This is because the statutory planning area was small; it did not even cover Mzizima District in its entirety. To be precise, in the north the area was bordered by the River Mbezi, which is close to Kawe, in the west it ended at Ubungo and Tabata and in the south it ended at the River Mzinga and the creek, as well as Kigamboni. This means more than 60% of the area under the modern City Council was not covered by the plan because it had not yet urbanised. As such, Mr Erio's clarification to the regional officials on the objectives of the plan was distorted by mistakenly baffling the plan with the United Nations'

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traditionally, that would not last longer and in unplanned areas was what was considered as squatting. The paper was echoing Mr. Sharp's view on removing 'substandard housing units' which housed about 12,000 people in Dar es Salaam. Cf. *The Standard*, 11.10.1968

<sup>41</sup> URT, *National Capital Master Plan, TS: Economic Evaluation*, 2.

<sup>42</sup> *The Nationalist*, 02.11.1968

<sup>43</sup> *The Nationalist*, 22.11.1968

concept of Dar es Salaam sub-Region, a concept which sought to arrest rural-urban migration by industrialising and mechanising agriculture in Ruvu, Bagamoyo, Kibaha and Kisarawe.

The focus on housing left its mark in the 1968 master plan. Twenty-two blocks were to be developed for building houses under NHC, factories and self-help schemes. Infrastructure-wise, the master plan noted the sanitary drainage in accordance to the report which was prepared by Howard Humphreys and Sons in February 1967. The report indicated that the CBD, Upanga and Kariakoo were serviced by a sewer system which discharged effluent to the sea by gravity.<sup>44</sup> At the time, the capacity of the system was 19.3 million gallons a day. Real effluent production was said to be 0.9 million gallons a day. This means that the sewer system was projected to last longer and serve the growing population of the three areas. In other areas, industrial and residential, the sewage would be collected by cars and sewers to the nearby treatment ponds. Since many people in the formerly African areas used pit latrines, the latrines became potential areas for breeding flies, produced a bad smell and they had short life. The planners suggested adopting flush toilets as they were “a much better sanitary method.”<sup>45</sup> The planners were cognisant of the economic condition of Tanzania in general and of Dar es Salaam urbanites in particular. In the 22 residential blocks indicated in the master plan, suggestions were made to ensure that every new housing unit abided by the plan. Also, there was a provision of unpaved roads and water mains on roads, provision water to each dwelling unit, and roads were to be paved with ditches for storm drainage and streetlighting included.

Although the planners were emphatic on sewerage because of the potential health dangers it posed if the population grew in future, they proposed storm water drainage for every paved road.<sup>46</sup> Thus, they envisioned Dar es Salaam having two separate drainage systems: sanitation and storm water drainage systems. With respect to sanitation, they suggested establishing communal septic tanks. The tanks could be emptied by other means but were not connected to the old sewerage network that served only the old town areas. This implies that they wanted the city to have a splintered sanitation system by having a multiplicity of sub-networks in different residential estates. With respect to the water supply, the planners wanted the city to have a single network. As a matter of fact, people continued using pit latrines until the end of implementing the 1979-1999 master plan. The 2012 population and housing census indicates that pit latrines are still the predominant sanitation structures as 59.5% of the households in the city use them.<sup>47</sup> This implies

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<sup>44</sup> URT, *National Capital Master Plan: TS5 – Public Services and Utilities*, 32.

<sup>45</sup> *Ibid.*, 34.

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

<sup>47</sup> URT, *Dar es Salaam Region: Basic Demographic and Socio-economic Profile – 2012 Population and Housing* (Dar es Salaam: National Bureau of Statistics, 2016), 93.

that the government and people failed to play their part in implementing the planners' suggestions for various reasons.

With respect to storm water drainage, there was some description of the system in the master plan. The planners were mindful of the fact that the city was located in a gently sloping area from the Pugu escarpment to the Indian Ocean coast, and that it was naturally drained by a system of small waterways and creeks. Secondly, they had observed that very few areas had been installed with storm water drains. These were Ilala, Kariakoo, Upanga, Magomeni and Kinondoni. Thirdly, the planners were aware of the persistent flooding that faced a number of streets because the surface drains did not cover all the built-up areas in the city. Finally, they noted that the CBD had a combined drainage system that was functioning fairly well.<sup>48</sup> There was a concern over lack of a standard design of storm water drainage: open ditches co-existed with drains. The planners yearned to see the City Council adopt one design for the whole city. Sensing the danger caused by flooding and given that the city had rains almost throughout the year, they suggested installing a comprehensive open surface drainage system because it was cheaper and more efficient than a piped network. The surface drains were to be directed to the nearby natural waterways and creeks (see Figure 5.3 below). Their surfaces had to be concrete lined.

In their conclusion, the planners stressed the importance of having separate drainage systems and of making the streets technological junctions by making sure that all infrastructural services could utilise the road space. While the latter had been common in cities in the Global North since the 19<sup>th</sup> century, the former was not.<sup>49</sup> To illustrate, the *1968 Dar es Salaam National Capital Master Plan* reads in part:

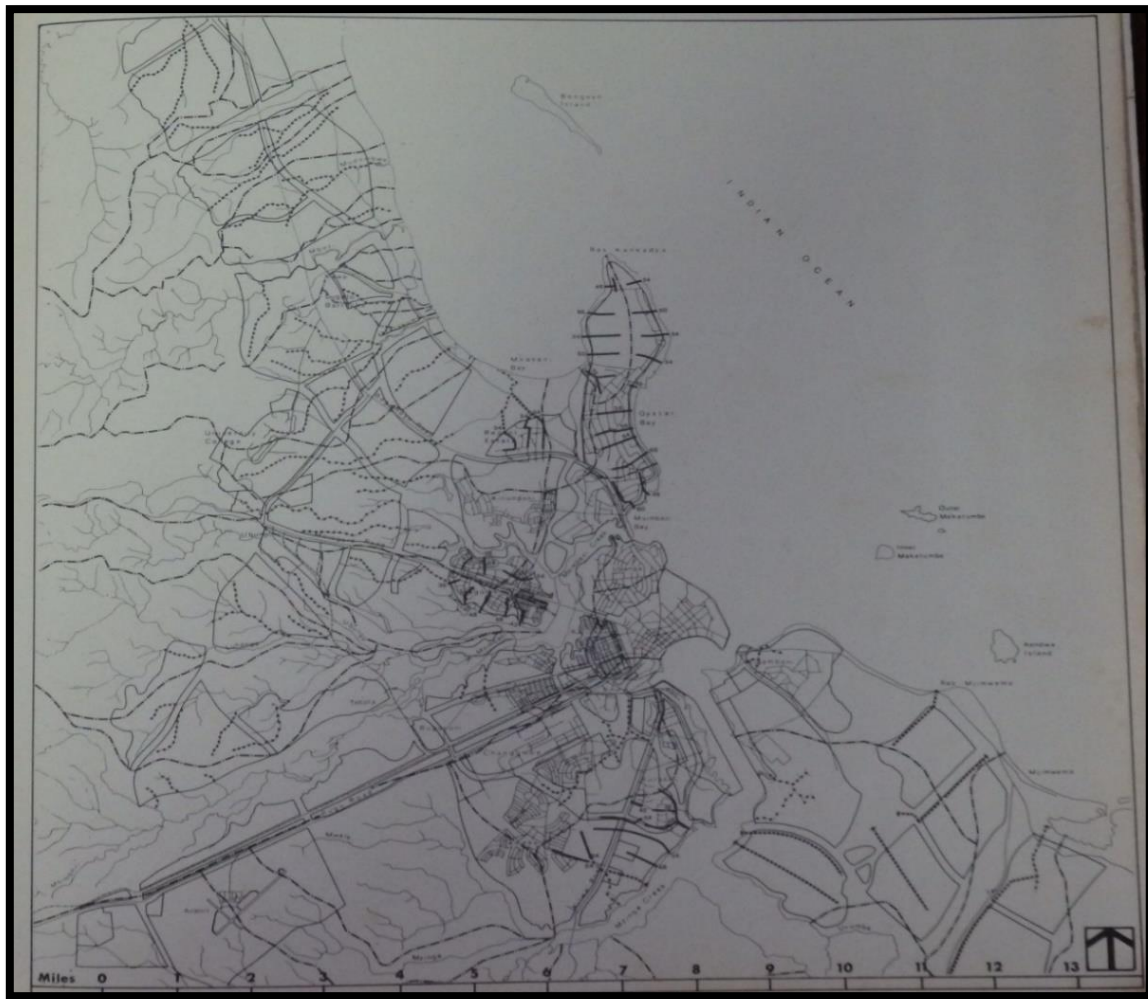
For the future development of the City, every effort must be made to restrict surface run-off from entering the sanitary sewerage system.... It is recommended that for those roads which will contain all the services necessary for land development (water, sanitary sewerage, storm drainage, power, street-lighting, telephone, etc.), a standard cross-section of road is produced to co-ordinate the placement of these services in relation to each other.

The Dar es Salaam National Capital Master Plan was a national project whose implementation was to be supervised by the central government. The City Council had no significant role in its planning, supervision, financing and implementation. On the other hand, the language of the report, especially in the suggestions, reveal that the planners thought the City Council was jurisdictionally responsible for implementing the plan. For implementation purposes, the government disbursed funds to three key areas: housing, water and industrial development.

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<sup>48</sup> *Ibid.*, 49.

<sup>49</sup> See Hans Buitier, "Constructing Dutch Streets: A Melting Pot of European Technologies" in *Urban Machinery: Inside Modern European Cities* edited by Mikael Hård and Thomas J. Misa (Cambridge: The MIT Press, 2008): 141-162.



**Figure 5.3:** Proposed Storm Water Drainage System in Dar es Salaam indicated by bolded lines  
*Source: URT, Dar es Salaam National Master Plan of 1968*

The other things proposed in the plan were largely not done, probably because they were deemed not beneficial to the national economy. While roads were built to link industrial areas with the newly surveyed residential areas, they were not constructed with ditches. Emphasis was on improving mobility, but not on the sustainability of the traffic infrastructure as well. What the planners regarded as a critical infrastructure to the city in relation to physiography, weather, economy and the built nature was undervalued by the government, when setting its priorities during implementation of the plan. Consequently, in many street roads were swept away by floods when it rained, thus affecting people and vehicular mobility, and damaging roads by creating potholes or eroding the roadsides (see Figures 5.6 and 5.7 below). As Figure 5.2 shows, four years after the implementation of the plan had started the media presented the flooding of urban roads as an old normal that people had become used to.

As the 1968 Master Plan reveal, the planners understood that surface drainage was not important for the traffic infrastructure alone. They also understood that it was also important to

develop residential lands. However, the implementers of the plan were oblivious to the importance of surface drainage. Moreover, the civil engineers who built the roads employed the same engineering culture as used during the colonial period. They underrated the value of surface drainage as a critical infrastructure to the vulnerable traffic infrastructure. By ignoring surface drainage, the post-colonial urban governance was also exhibiting the continuity of the colonial techno-political practices which installed drainage systems in the European and Asian residential areas, but not in the African residential areas as well. The colonial and post-colonial governments were concerned more with plots and the provision of housing than with infrastructure that would enable the areas to be resilient during floods.

### *5.2.2 The 1979 Dar es Salaam Master Plan*

A decade after the implementation of the 1968 Dar es Salaam National Capital Master Plan, the government, through the Ministry of Lands, Housing and Urban Development, released a new master plan – the 1979 Dar es Salaam Master Plan. Like the preceding plan, the latter plan was also supposed to be implemented in a duration of 20 years, that is, until 1999. Its preparation was funded by the Swedish government and it was prepared by a Canadian, the Marshall Macklin Monaghan Ltd. The reason for releasing the plan was obvious: the city had lost the national capital status in 1973. The forces behind changing the capital, as discussed in Chapter II above, were political and the deep resolve of the state to translate its primacy of rural policy development by bringing services closer to the rural masses – in this case, at the country’s geographical centre, namely Dodoma. Dar es Salaam lies due east of Tanzania and very far from many rural areas, and because of its position, the argument went, it was causing asymmetrical national development, which needed to be arrested.<sup>50</sup> As such, the resources which were to be used to implement the national capital project had been diverted from Dar es Salaam to Dodoma. The city needed a new plan.

The 1968 master plan was enmeshed with the national Five-Year Development Plans, which underscored the primacy of the industrial sector in the urban areas. Proportionally, Dar es Salaam had the biggest number of industrial establishments of all the urban centres in Tanzania which could not be moved to the new capital. As the assessment of the 1968 master plan revealed, housing schemes, water supply, electricity and roads had been improved significantly because of industrialisation. On the contrary, “little progress has been made in upgrading of sewage, drainage or solid waste facilities since 1968” and that the situation was “aggravated by the rapid expansion

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<sup>50</sup> Emily Callaci, “‘Chief Village in a Nation of Villages’: History, Race and Authority in Tanzania’s Dodoma Plan”, *Urban History* 43, no. 1 (2016), 96-116, here at 100.

of residential and industrial areas.” It was feared that the latter development posed serious health dangers to the urbanites, unless action was taken in the newly released master plan.<sup>51</sup>



**Figure 5.4:** Flooded Quarters Built for Africans in Magomeni during the British Colonial Era  
*Source: Daily News, 16.12.1981*

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<sup>51</sup> URT, *Dar es Salaam Master Plan: Summary* (Ontario: Marshall Macklin Monaghan Ltd., 1979), 3.



**Figure 5.5:** Flooded Market in Postcolonial Street in Dar es Salaam

*Source: Daily News, 16.02.1985*

The 1979 master plan was set to be implemented in three phases that went hand in hand with the city's population growth change. The first phase was planned to begin in 1979 and end in 1984 when the population would have reached 1.3 million people from 0.89 million people. In this phase, the focus was on addressing the pressing urban problems. These were the water supply, sewage collection and disposal, storm water drainage, solid waste management, the electrical supply and management, transport and local servicing.<sup>52</sup> The second phase was planned to cover the period 1985-1989 when the population would have reached 1.6 million people. The railway crossing and the road to Kigamboni were the main goals of this phase apart from the city-wide road improvements. The last phase was to cover the period between 1990 and 1999 when the population would have grown to 2.5 million people.<sup>53</sup> In this phase, the major goal was extension and expansion of infrastructural services to newer residential areas that would have emerged. The planners advised all actors and institutions responsible for providing infrastructure and utilities to coordinate their activities in order to ensure all the services needed were available. They needed to work in close coordination with the city administration which, they noted, had not been involved

<sup>52</sup> URT, *Dar es Salaam Master Plan: Five Year Development Programme* (Ontario: Marshall Macklin Monaghan Ltd, 1979).

<sup>53</sup> URT, *Dar es Salaam Master Plan Summary*, 10.



in the implementation of the previous plan. Therefore, the 1979 master plan was simultaneously reactive and proactive by seeking to fix quickly the past plan and to pre-empt the potential future problems associated with population growth.

The 1979 master plan was released in a year when the nation was deeply experiencing the economic crisis that had begun slowly in 1973 and was exacerbated by the then just ended Tanzania-Uganda War, the oil shortage after the 1979 Iranian Revolution, drought and an almost total halt of the vast manufacturing parastatals. The government, as the sole financier of the implementation of the plan, was thus caught between addressing the pressing national needs like food and oil shortages, paying national debts and establishing economic recovery programmes on the one hand, and addressing the city development issues as indicated in the plan on the other. As a rule of thumb, the government put the national issues at the top of its priorities. The economic crisis was deep and it was not affecting Tanzania alone. The recovery took longer than thought. The long economic recovery had serious implications for the implementation of the master plan: in fact, the plan was shelved. With the burgeoning infrastructure crisis in Dar es Salaam and other urban centres in Tanzania, the government decided to stop using the master planning approach in urban development.<sup>54</sup>

In 1992, the government felt the imperative to do away with the master planning approach which had been in use in Dar es Salaam for a century, citing a number of reasons. The government offered detailed reasons in 2002 as it justified a new framework for developing sustainable urban programmes. First, the government admitted that the approach failed because there was no “institutional mechanism to coordinate the various public ... sector parties involved in managing and/or investing the necessary resources.” The Attorney General of Tanzania, Damian Lubuva, had earlier identified coordination, legislation and the overlapping of duties as reasons behind the failure of master planning.<sup>55</sup> Secondly, it was reported that the parties’ interests were not represented in the making of master plans, leading to a lack of commitment to implement the plans. For instance, the Dar es Salaam City Council felt the master plans were the onus of the central government, and vice versa. Additionally, the public was not involved in implementation thus rendering plans to be modernity from the above, by the above and for the above. The sense of ownership was lost. Thirdly, the approach failed because the plans were “comprehensive in nature resulting in idealistic and unaffordable infrastructure and social services development.” Fourthly, the approach was blamed for following rigid standards and being “too ambitious” by aiming at

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<sup>54</sup> Tumsifu Jonas Nnkya, *Why Planning Does Not Work? Land-Use Planning and Residents’ Rights in Tanzania* (Dar es Salaam: Mkuki na Nyota, 2008).

<sup>55</sup> See “Dar City Workshop Ends: Urges Collective Approach” in *Daily News*, 02.09.1992

“creating the ‘best possible’ city.” Lastly, the government argued that the master planning approach focused mainly on land use at the expense of “the need to strengthen management capacity.”<sup>56</sup> By and large, these reasons were structural and genuine. By nature of the then spatial planning, such reasons behind failure of master planning could not have been evaded unless there were local planners and a critical mass of local engineers for implementation master plans.

Moreover, the fundamental and unstated reason against continuing with the master planning approach was the government’s failure to remit funds for the capital projects outlined in the master plans. The state had lost its ‘proud defiance’ of the 1960s and 1970s, which had made the state implement spatial plans with its own funds, because of the bruises of the long and deep economic crisis.<sup>57</sup> Urban development was now at the mercy of external actors and agencies, which made the government lose autonomy in project planning and implementation. International agencies, NGOs, academics and donors, on the other hand, exploited the moment by seeking to provide infrastructural services in few and smaller places. Led by UNEP, UN-Habitat, UNDP and the World Bank, they labelled their endeavours as Sustainable Cities Programme (SCP).<sup>58</sup> As newspapers noted comments in several SCP workshops, the key speakers constituted an emerging body in urban planning. They were led by Kironde, Kyessi, Materu and Zacharia, who were working at Ardhi Institute.<sup>59</sup> These local specialists have, ever since, been influential in the survey and planning departments of the Ministry of Lands, Housing and Urban Development. Was the rejection of master plans, therefore, partly a product of a ‘boring from within’ or candid advice based on the relevant context?

The government noted that SCP aimed to support urban growth that is environmentally sustainable.<sup>60</sup> That was a superficial aim. Fundamentally, it was in favour of a splintered planning and infrastructure development model. SCP did not envision the city holistically. It cemented inequality in urban development although it claimed to provide infrastructure solutions to the areas that had the worst services. Moreover, in the areas chosen for the SCP intervention, attention was given to problems of one kind of infrastructure, leaving others unaddressed. The kinds of

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<sup>56</sup> All quotes taken from the letter of PS for Ministry of Lands and Housing Development to PS for Ministry in President’s Office for Regional Administration and Local Government dated 05.03.2002. See in CZNA, RALG/M.50/14: Ministry of Lands, Housing and Urban Development; Cf. “Population threatens Dar environs – SDP” in *Daily News*, 03.06.1996.

<sup>57</sup> Mukandala, “From Proud Defiance to Beggary”.

<sup>58</sup> Dar es Salaam Metropolitan Development Project accessed in [www.dcc.go.tz](http://www.dcc.go.tz) on 19.02.2014; UN-HABITAT, *The Sustainable Dar es Salaam Project 1992-2003: From urban environment priority issues to up-scaling strategies city-wide* (Nairobi: UN-HABITAT, 2004).

<sup>59</sup> In the *Daily News*, 08.02.1992, under the heading “Dar Master Plan Irrelevant to Local Situation”, Materu and Zacharia said the master plan was irrelevant because it ignored local family structures. It thought that men are breadwinners and that Tanzania has nuclear families, which was largely not the case.

<sup>60</sup> Letter from PS for Ministry of Lands to PS for Ministry for Local Government dated 05.03.2002 in CZNA RALG/M.50/14: Ministry of Lands, Housing and Urban Development.

infrastructure favoured were sanitation, water provision and solid waste management owing to their connection with environmental sustainability. The areas which benefitted were Mikocheni ward, Buguruni, Mwananyamala and some parts of Tandale. This is less than 10% of Dar es Salaam.

There was lack of clarity amongst the government and City Council officials as to how to develop and implement the new programmes under SCP between 1992 and 2002. This means that, when the government decided to abandon the master planning approach, it was compelled to do so by the international agencies. It had not articulated SCP. The government had let UNEP, UNDP and UN-Habitat develop a SCP demonstration model which was known as the Sustainable Dar es Salaam Project (SDP). SDP brought together officials from the City Council and developed a database of environmental issues which were to be considered in the development of spatial plans. SDP also emphasised developing small-scale spatial plans that could be implemented using the available limited resources. After learning SDP, the government, through the Ministry of Lands, developed a framework for spatial planning, which had to be tested in Dar es Salaam before it could be used in other urban centres. The framework was issued in 2002 and was called the Strategic Urban Development Plan (SUDP).<sup>61</sup> Its development had begun slowly in 1996 with workshops aimed at building the capacity of key actors.<sup>62</sup> Unlike master plans, SUDP allows for active participation of the public in plan development. Since then, a number of areas on the outskirts of Dar es Salaam have been planned separately. There have also been improvements in sanitation and waste management in some of the areas which were in critical condition. However, within the government and City Council circles, there has not been satisfaction with the ending of the master planning model. In 2012, Dar es Salaam City Council produced the 2012-2032 Master Plan. Tabora Municipal Council, a municipality in western Tanzania, also produced the 2016-2036 Master Plan. These two developments have signalled the return of the master planning approach through the back door. At least, this time the plan was prepared by the City Council and by local experts.

Whether the re-emergence of the master planning approach would yield the desired results in future or not is yet to be known.<sup>63</sup> The preponderance of foreign funding and experts in planning, lack of local participation in spatial planning – at both leadership and public level, organisational coordination of plan implementation, lack of a critical mass of spatial planners and civil engineers are genuine reasons for the failure of master plans in the post-colonial era. In addition, the gap between planners and implementers was extremely influential in the failure of master plans.

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

<sup>62</sup> See the news under heading “Premier rails against bad urban plans” in *Daily News*, 16.10.1996; Nnkya, *Why Planning Does Not Work?*, 270.

<sup>63</sup> Samson Elisha Kasala, “A Return of Master Planning in Dar es Salaam: A Misconception of the Theory of Paradigm Shifts?”, *Global Journal of Human-Social Science* 15, no. 2 (2015), 1-7.

Working as consultants, planners prepared documents, submitted them to the governments and left shortly after they had finished their tasks. Implementation of the plans was left in the hands of a government which knew that it had a critical shortage of technical personnel, as discussed in the next chapter. At least the 1968 master plan was implemented because it coincided with the Second Five-Year Plan, which made the city the hub of industrialisation. The country had a fair amount of resources to execute some of the technical projects included in the master plan through the central government organs. It also had a significant number of foreign expatriates who wielded some influence on the top leaders of the nation. Most of the expatriates started leaving the country in the mid-1970s. They left a murky transitional phase behind in terms of manpower. Later, other events emerged and complicated the implementation of the master plans. The government was silent on the events when it justified the adoption of the SUDP framework in 2002. Nor have they been appreciated by scholars. The two events are *Madaraka Mikoani* and the economic crisis that began in 1979; they are discussed in the following sections.

### **5.3 Against Dar es Salaam: *Madaraka Mikoani* and Urbanisation**

In 1972, the government dissolved local government councils. The decision to dissolve the councils was initiated by the central executive committee of the ruling TANU and later submitted to the government for announcement and implementation. The government declared the political statement in May 1972, a statement which was most consequential in urbanisation in Tanzania. It was then sent to Parliament for endorsement and for enacting a supporting law; the law was passed in July 1972. The declaration was known as *Madaraka Mikoani* and was described in a 72-paragraph presidential speech.<sup>64</sup> According to the government, *Madaraka Mikoani* was part of the broader goal of achieving the goals of the Arusha Declaration of 1967. The declaration transformed the country from a liberal state to a socialist state. It emphasised elements of African egalitarian values and self-reliance.

The reason for introducing *Madaraka Mikoani*, the government said, was taking decision-making powers over people's and national development away from the government and on to the people. The government wanted to instil values of the participatory approach in development. It was giving voice to the people and empowering them to make decisions over their future. In theory, *Madaraka Mikoani* was an excellent move by the government. The central government's role in making decisions for people's development was decentralised at three levels: regional, district and village. It meant making decisions over local industries, local tourism, educational services, trading, food production, building, water provision, labour mobilisation in collective projects, distribution

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<sup>64</sup> CNZA, PM/R50/20: Regional D.D. Quarterly Reports – Dar es Salaam.

of the products of their labour and the provision of other services. The central government was now supposed to act on critical national issues and foreign policy and support the decentralised bodies by providing advice and funding where necessary. The government officials at district level who were initially answerable to the ministries were now directly answerable to the people and their immediate decentralised bodies. It also reduced bureaucracy in financial spending and overseeing as they could use government money without consulting with the central government based in Dar es Salaam. Under such governance model, it was believed that the country would develop fast as people would be committed to all development works as they owned them.

However, *Madaraka Mikoani* was not articulated well, thus causing problems in its implementation. First and foremost, the people's representation was still in the hands of elected representatives from the dissolved councils – district, town, municipal and city councils. TANU party chairpersons at regional, district and village levels were made the new development leaders, who chaired the newly formed development councils. They had the power of veto on the decisions made, thus asserting the party supremacy. Decisions were made in the same old style but this time with more party supervision. Thus, decentralisation was only rhetorical as it was never translated as envisioned. Secondly, the declaration was inherently against urban sector interests as it sought to give more powers to rural people and emphasised the primacy of rural development.<sup>65</sup> In simple terms, it can be construed that national development was being channelled to the urban areas where leaders hailed from and worked. By virtue of living and working in Dar es Salaam, the leaders were believed to be failing to understand and provide solutions to the rural development problems.<sup>66</sup> As such, Dar es Salaam was seen as siphoning off national development resources and handicapping the development of an equitable socialist Tanzania, something that needed to be rectified. Similar reasoning was used to justify the shift of the capital from Dar es Salaam to Dodoma. In fact, we argue here that the *Madaraka Mikoani* reasoning fast-tracked the discussion on this shift within the government and party circles.

Most scholars allude that *Madaraka Mikoani* was against urban development simply because it led to the dissolution of urban councils. They ignore the fact that there were other reasons. For instance, the installation of party supremacy in the development agenda in the government was ignored as well as the emphasis of rural policy. One of such scholars is Emily Callaci, who contends that the dissolution of the town and municipal councils between 1972 and 1978 clearly indicated that *Madaraka Mikoani* was after defunding urban areas.<sup>67</sup> It is important to do a broader analysis of the whole *Madaraka Mikoani* to understand its anti-urbanism well. Apart from what was

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<sup>65</sup> Callaci, *Street Archives and City Life*, 41.

<sup>66</sup> CZNA, PM/R50/20: Regional Quarterly D.D. Quarterly Reports – Dar es Salaam.

<sup>67</sup> Callaci, *Street Archives and City Life*, 41.

mentioned above, the dissolution of the urban councils led to the creation of regional and district development corporations, which dealt with both the rural and urban areas. Since the rural areas are bigger in size and have bigger populations than the urban areas, the development corporations had to serve the majority first. This was the first unforeseen implication *Madaraka Mikoani* for urbanisation. The second implication was the fact that most of the experts of the urban councils, both local and foreign, either left or were posted to other duty posts that did not deal with urban issues.<sup>68</sup> Consequently, the urban conditions changed from bad to worse within a short time. This is because development corporations lacked specialists on urbanisation and were overwhelmed by rural issues. Thirdly, *Madaraka Mikoani* influenced the revision of the Dar es Salaam master plan in “an attempt to concentrate on building up cohesive social and political neighbourhoods on a semi-decentralized basis.” In other words, it made the implementation of the master plan play down the infrastructure building, repair and maintenance. The reason behind this socio-political emphasis was the state’s intention to benefit the rural areas and other towns, which had been starved between 1967 and 1977, the time when the city was serviced well.<sup>69</sup> If this reasoning is correct, the 1979 master plan was destined to remain a modernity document on paper.

In less than a decade, the government was forced to rethink the development of the urban sector following the dissolution of the urban councils which had also affected the City Council of Dar es Salaam. First, in April 1978 Parliament enacted a provisional law for re-establishing urban councils. The law was known as the *Urban Councils (Interim Provisions) Act, 1978* which provided for the re-establishment of councils by 1<sup>st</sup> July, 1978. To this end, UNDP was consulted by the government to help review urban development and suggest the best way to reconstitute urban councils. Mr James A Green conducted the review and submitted the report in August 1978. In his report, Mr Green said that the staff situation was worse than it was in 1972, before the dissolution of the councils. He said that most of the experts needed were not available in the country. The experts needed were engineers, town planners, building inspectors, health administrators and accountants. He added that immediate local government courses were needed for the urban councils’ staff. Finally, Mr Green suggested that the government should find an expert in local

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<sup>68</sup> See “Report of a Mission to the United Republic of Tanzania, 14-30 May, 1978 by Mr. James A. Green” attached in letter dated 23.08.1978 from United Nations Resident Representative to PS, Prime Minister’s Office in CZNA, PM/VA/8/4.

<sup>69</sup> All quotes taken from *Africa Contemporary Record: Annual Survey and Documents 1978-1979* (New York and London: African Publishing Company, 1980), B412. The *Africa Contemporary Record* for 1976-1977 reported that the water supply and power infrastructure for Dar es Salaam had been resolved, thus easing the crisis of 1973-75. But other towns and rural areas were still facing the crisis.

government systems and fiscal arrangements to craft appropriate legislation to guide urban governance.<sup>70</sup>

The re-establishment of urban councils in 1978 gave the government room to assess the broader impact of *Madaraka Mikoani*. Like in the performance assessment of the District and Regional Development Corporations, it was the Prime Minister's Office, which carried out the overall assessment over performance of the District and Regional Development Councils, established under *Madaraka Mikoani*.<sup>71</sup> The negative effects were felt not only in urban development but also in rural development because the dissolution of the local government structures involved both urban and rural councils. As such, in 1982 the government re-introduced the local government system.<sup>72</sup>

To re-introduce the local government system, the government crafted and tabled a bill in Parliament on 30<sup>th</sup> April 1982. The bill came at the expense of two laws: the *Urban Councils (Interim Provisions) Act*, 1978, and the *Village and Ujamaa Villages Act*, 1975.<sup>73</sup> The two laws, all established in the aftermath of *Madaraka Mikoani*, were repealed in order to establish a local government law which would bring a uniform system in all local government authorities in Tanzania. Tabled by the Minister of State in the Prime Minister's Office, Ms Getrude Mongella, the law stated that the local authorities would be responsible for "maintenance of roads in townships, garbage collection, health services, storm water drainage systems, rural markets, market stalls, car parks, fire prevention and cemeteries."<sup>74</sup> The Local Government (District Authorities) Act was enacted to improve local governance in both the rural and urban areas by giving them financial and legislative powers in their areas of jurisdiction and having collective leadership, instead of one-man rule.<sup>75</sup> The return of the urban councils in 1982 was hailed by the commentators of the time. "Urban services had improved somewhat, with renewed urban councils replacing regional authorities, which were basically rural-oriented", the *African Contemporary Record* noted. It pointed out, however, that the re-established councils "remain under severe pressure because of financial and imported goods constraints," caused by the economic crisis.<sup>76</sup>

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<sup>70</sup> "Report of a Mission to Tanzania," CZNA, PM/VA/8/4.

<sup>71</sup> Permanent Secretary for Prime Minister's Office to Managers of District Development Corporations dated 29.03.1979 in CZNA, PM/R50/20 Regional D.D. Quarterly Reports – Dar es Salaam.

<sup>72</sup> Letisia Moses Warioba, "Management of Conflict in City and Municipal Councils in Tanzania with Specific Reference to Iringa Municipal Council and Tanga City Council" (PhD diss., University of South Africa, 2008), 75-78; In Rwekaza S. Mukandala, "The Centre and Local Institutions of Governance", *The African Review* 22, no. 1/2 (1995), 122-139, the local authorities were discussed as if they were established for the first time in 1982. There was neither a single account over why they were established in 1982 nor a brief background to the local authorities in the earlier years. As such, ahistorical accounts that do not present even the context are common in some social science works.

<sup>73</sup> "Village Act to be Repealed" in *Daily News*, 28.04.1982.

<sup>74</sup> *Daily News*, 30.04.1982.

<sup>75</sup> *Daily News*, 28.04.1982.

<sup>76</sup> All quotes taken from *Africa Contemporary Record: Annual Survey and Documents 1981-1982* (New York and London: Africana Publishing Company, 1982), B292.

#### 5.4 Final Nail in the Coffin: The Economic Crisis and Infrastructure Abyss

On 4<sup>th</sup> February 1985, the state English paper, the *Daily News*, carried a news story about the unilateral suspension of construction work on the Msimbazi-Magomeni road that linked the busiest commercial centre and one of the key residential areas in the city. The construction of the road was tendered by the City Council to the national engineering company, Mwananchi Engineering Contracting Corporation (MECCO) in 1981. Its length was less than 2 kilometres. MECCO Director General Mr G E Mponzi said the reason behind the halting of construction was the City Council's failure to remit more than two thirds of the tendered bill to the company. The news came two days after the same newspaper had reported about the abyss on Msasani Road (shown in Figure 5.7 below). The report held that, for about a year, the road drainage and passage had not been repaired by the City Council. What caused the road damage and the drainage problem was the broken water pipe, the news report concluded.<sup>77</sup>

The duration of constructing the Msimbazi-Magomeni road, non-remittance of funds, the duration of the road drainage and the water pipe problem, and the lack of repairs provide a glimpse into the state of infrastructure building, maintenance and repair that characterised Dar es Salaam from 1979 to the mid-1990s. It also provides a snapshot of the bigger nation-wide crisis (the economic crisis) that faced Tanzania from 1979 to the beginning of the 21<sup>st</sup> century. The economic crisis, which was the main subject of social science research in the 1980s and 1990s in Tanzania, had both global and local roots.<sup>78</sup> The crisis manifested itself on both people and the state and was “the most severe since its independence in 1961.”<sup>79</sup> The crisis affected industrial and agricultural production, as well as the construction sector owing to a shortage of fuel, spare parts, foreign currency for importing building materials and providing social services, and the budget deficits that affected the urban authorities' activities and the daily urban life.<sup>80</sup> Apart from the inability to build, maintain and repair the infrastructure of Dar es Salaam, the state and the City Council failed to implement the 1979-1999 master plan, let alone controlling urban sprawl. The state recognised the failure to oversee the master plan in 1992 when it decided to abandon the master plan approach and adopt the Strategic Urban Development Planning framework instead.<sup>81</sup>

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<sup>77</sup> *Daily News*, 02.02.1985.

<sup>78</sup> Jannik Boesen et al. (eds), *Tanzania: Crisis and Struggle for Survival* (Uppsala: Scandinavian Institute of African Studies, 1986), 19-24; *Africa Contemporary Record: Annual Survey and Documents 1980-1981* (New York and London: Africana Publishing Company, 1981), B325-B329.

<sup>79</sup> *Africa Contemporary Record: Annual Survey and Documents 1979-1980* (New York and London: African Publishing Company, 1981), B321.

<sup>80</sup> On how the people of Dar es Salaam reacted to the crisis hardships and entered into antagonisms against the state; see Callaci, *Street Archives and City Life*, 196-206.

<sup>81</sup> Letter from Principal Secretary for Ministry of Lands, Housing and Urban Development to Principal Secretary for Regional Authorities and Local Governments dated 05.03.2002.



To cut the long story short, the national economic crisis had far-reaching consequences in infrastructural development in Dar es Salaam. As the title of this chapter suggests, the traffic and drainage infrastructure, like all other kinds of infrastructure, were in crisis for more than a decade, thus making people live with damaged and unrepaired infrastructural systems. This section examines the relationship between the economic crisis and the state of infrastructure in Dar es Salaam, particularly the drainage and traffic infrastructure. Newspapers are very helpful in reconstructing the state of infrastructure, people's adaptation and reactions, and the place of the state during the two decades of the crisis. Economic status reports are also important sources in this regard. They provide assessments and show the position of the state during the crisis, particularly in relation to urban technologies like the drainage and the traffic infrastructure.

The country took austerity measures to cope with the crisis.<sup>82</sup> Party and government newspapers, as well as the government's economic status reports agree that the crisis affected the building of urban infrastructure because it reduced enormously the availability of funds and the availability of building materials. In one instance, a short railway line (only 24km long) to link the Ubungu industrial area with the Wazo Hill cement factory in Dar es Salaam was not built in 1979 because the government could not disburse 40% of the funds because of the crisis. The total project budget was 75,411,231 Tanzania shillings, of which 60% was to be provided by the Bank of Brazil as a loan. The construction company, CICOL from Brazil, had already surveyed the area.<sup>83</sup> Because the Tanzanian government could not provide the funds, the project was not implemented. The government's inability to disburse the funds for Dar es Salaam projects was not an isolated case. In the development of the new national capital of Dodoma, "the government had promised that 10% of the budget would be allocated to the Dodoma project"; because of the economic crisis "the money it disbursed never came anywhere near this proportion."<sup>84</sup>

A few months after the plan to construct the railway was announced, the *Daily News* reported a hike in the price of cement, a critical building material. It was an obvious signal that there was a shortage of cement. The rise was announced by the National Price Commission. Strangely, the paper did not state the reasons for the rise. But the government mentioned oil shortages, the inability to import critical machinery spare parts for factories and some of the raw materials as the main factors. The two factors contributed to the lowering of the production of cement, which consequently resulted in a severe shortage of cement.<sup>85</sup> Although the cement shortage was severe from 1979 to 1984, the government had noted the shortage in 1976.<sup>86</sup>

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<sup>82</sup> *Africa Contemporary Record 1980-1981*, B341.

<sup>83</sup> *Daily News*, 08.08.1979.

<sup>84</sup> Kahama, *Sir George*, 82.

<sup>85</sup> URT, *The Economic Survey for 1981/82* (Dar es Salaam: The Government Printer, 1983).

<sup>86</sup> URT, *The Economic Survey for 1977/78* (Dar es Salaam: The Government Printer, 1979).

Moreover, within the government circles, the shortage was recognised as one of the critical factors for the infrastructure projects for Dar es Salaam not being implemented, starting in 1978. Other factors included storm water, high water table, which made the digging of toilet pits and the construction of toilets complicated, and people's unwillingness to participate in the projects.<sup>87</sup>

According to the *Daily News*, the Governor of the Bank of Tanzania also complained about how the high price of oil drained half of the national earnings. "The most significant factor that has put our economy completely out of gear in recent years is the ever-increasing price of oil", said the Governor.<sup>88</sup> This was the case from 1977 to 1980, and from 1981 to 1990. A study conducted by TIPER (Tanzania-Italian Oil Firm) in 1980 indicated that much of the imported oil served the "urban machinery, bypassing an overwhelming population in rural areas," a situation that displeased many, including the renown academic in the country, Mathew Luhanga.<sup>89</sup> Oil was extremely needed in most of the industrial and transport activities. A halt in those activities had a trickle-down effect on the whole national economy, especially on the construction of houses and urban infrastructure. The three cement factories in Tanzania of Wazo Hill, Tanga and Mbeya, whose combined production is 1,270,000 tonnes per annum, produced 247,000 and 378,285 tonnes in 1983 and 1984 respectively, because of the crisis.<sup>90</sup> In fact, locally-produced cement did not meet the local demand until 1988.<sup>91</sup> To make matters worse, the value of the national currency was depreciating at an unprecedented pace, thus affecting imports. The currency plunge continued up to the late 1980s.<sup>92</sup> Admittedly, the government was forced to reduce spending. Logically, the state could not invest in capital projects like master plans which sought to modernise the cities and towns with a little contribution to the national economic recovery. In *the Economic Survey* of 1982, it was reported that "the activities which involved urban master plans were stopped being undertaken during 1982/83 and thus hampering provision of infrastructures such as sewage drainage systems."<sup>93</sup> Consequently, the government reported in 2002 that there was "lack of rain water [sewerage] in urban areas lead rain water to enter into the main sewerage system causing over flooding and environmental pollution."<sup>94</sup> In other words, had the economic crisis not occurred, the government would have built the storm water drainage in the urban areas.

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<sup>87</sup> Letter from City Director to PS in Prime Minister's Office dated 09.11.1979 in CZNA, PM/R50/20: Regional D.D. Quarterly Reports – Dar es Salaam.

<sup>88</sup> All quotes taken from *Daily News*, 11.03.1980.

<sup>89</sup> See "Call to ban 'joy-rides'" in *Daily News*, 26.03.1980.

<sup>90</sup> JMT, *Hali ya Uchumi wa Taifa katika Mwaka 1984* (Dar es Salaam: Mpiga Chapa wa Serikali, 1985), 97; Emily Brownell's *Gone to Ground* reveals that cement shortage began in late 1970s.

<sup>91</sup> JMT, *Hali ya Uchumi wa Taifa katika Mwaka 1988* (Dar es Salaam: Mpiga Chapa wa Serikali, 1988), 127.

<sup>92</sup> JMT, *Hali ya Uchumi wa Taifa katika Mwaka 1989* (Dar es Salaam: Mpiga Chapa wa Serikali, 1990), 190.

<sup>93</sup> URT, *The Economic Survey 1982* (Dar es Salaam: The Government Printer, 1983), 138.

<sup>94</sup> URT, *The Economic Survey 2000* (Dar es Salaam: The Planning Commission, 2001), 184.

The second thing that could be learnt from the newspapers and the economic status surveys is that the repair and maintenance of urban infrastructure was now not part of routine activities in the responsible and technical institutions like the City Council. In other words, the culture of maintenance and repair was lacking. Perusing the papers published in 1979, we learn that the two technical matters started being dependent on political leaders' ad hoc orders, either after leaders experiencing poor infrastructure or after much media attention being directed to it. One citizen, Burchard Katesigwa, urged the Council to change its perception of repairs because "road repairs are more important than road sweeping or grass cutting which are done every day."<sup>95</sup> Through news reports on maintenance and repairs, we also learn about the state of traffic and drainage infrastructure in Dar es Salaam in the period between 1979 and 1999. Headlines like "These roads need repair"<sup>96</sup>, "Chang'ombe Road is bad"<sup>97</sup>, "Halmashauri ya Jiji Itengeneze Barabara" (the City Council Should Repair Roads)<sup>98</sup>, and "Adha ya barabara za Dar" (Strain of Dar Roads)<sup>99</sup> were common in papers between 1979 and the mid-1990s, despite the fact that they belonged to the ruling party or the government in a socialist state. They were so common that, in August 1991, a purported Malaysian tourist in Dar es Salaam wrote a letter to the editor of the *Sunday News*, expressing his dismay at the state of roads and the lack of repairs. Part of the letter reads:

Since I came to Tanzania I have seen media reports of those complaining about the terrible conditions in the city from Mwalimu Nyerere (President in the late 1970s and early 1980s) to President Mwinyi (Nyerere's successor), from the occasional to the man in the street – all have complained about the potholes, the dirt, dust, and amazingly nothing is done! This has really puzzled me! What else would it take for action to be taken, to get Dar to reflect the beauty of its people?<sup>100</sup>

The writer who identified himself as the 'Comrade from the East' had seen the bad state of the roads in Dar es Salaam caused by natural factors like floods and human factors like poor building standards and the lack of maintenance and repair. But what he did not know is that a year before his arrival, President Mwinyi had ordered the City Council to repair the roads.<sup>101</sup> The council repaired some of the roads. Lacking funds, the council seemed to wait for similar decrees in the coming years, decrees which were not regularly issued. The council was dissolved for the second time by the state on 28<sup>th</sup> June 1996, this time for failure to deliver services like infrastructural repair and maintenance.<sup>102</sup> As the letters to the editors and the president's decrees reveal, the urban citizens had no influence on the City Councillors, labelled as 'city fathers' in the English papers.

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<sup>95</sup> *Uhuru*, 20.04.1981.

<sup>96</sup> *Daily News*, 13.08.1979.

<sup>97</sup> *Daily News*, 06.05.1980.

<sup>98</sup> *Uhuru*, 20.04.1981.

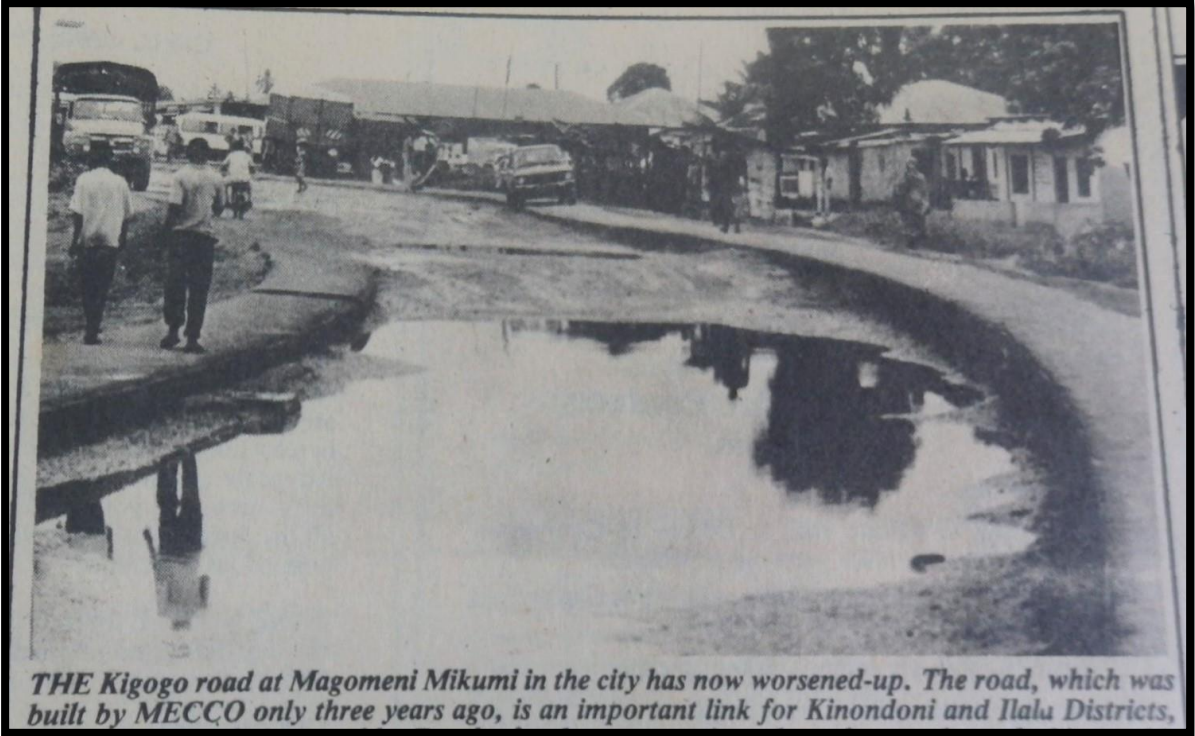
<sup>99</sup> *Mzalendo*, 06.05.1990.

<sup>100</sup> *Sunday News*, 18.08.1991.

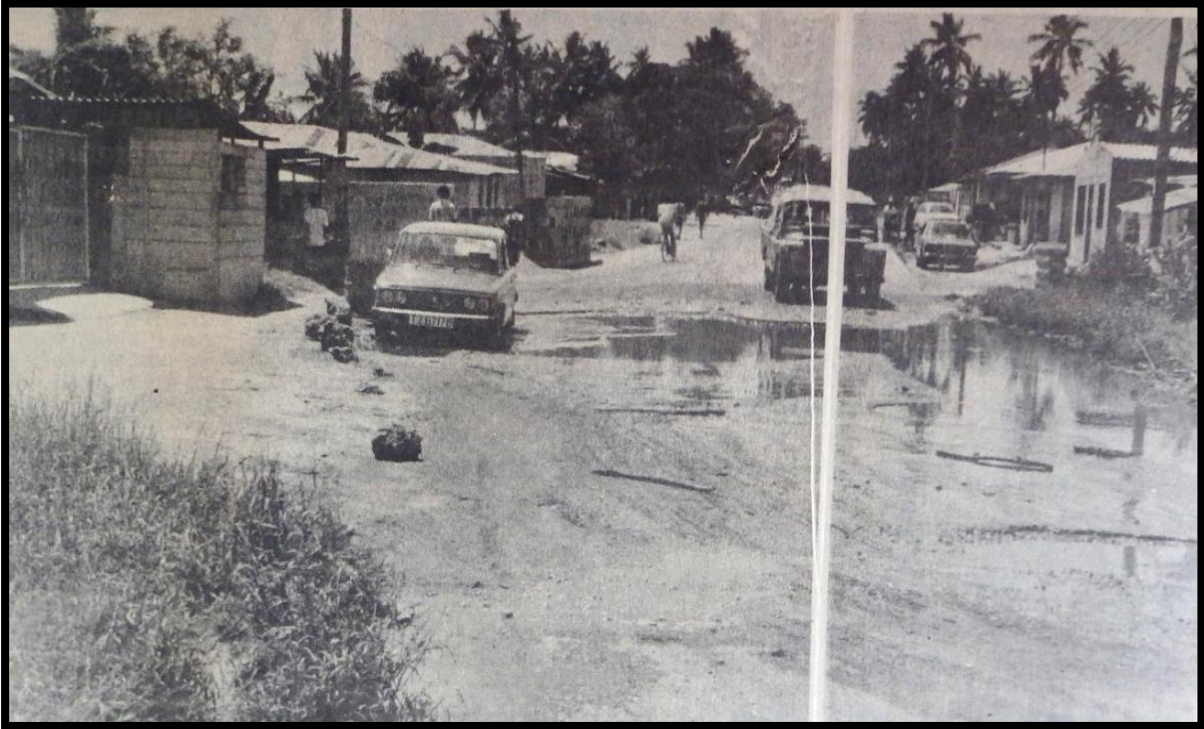
<sup>101</sup> *Mzalendo*, 08.04.1990.

<sup>102</sup> *Daily News*, 29.06.1996, had a heading "City Council Out: Commission to Run Dar for a Year".

People were forced to negotiate their ways in order to survive the troubles of the city and their daily hustles. The people were also facing the effects of the economic crisis like the high price of consumer goods and the rising unemployment levels.



**Figure 5.6:** Motorists Negotiate their Way on a Damaged Road.  
*Source: Daily News, 28.02.1990*



**Figure 5.7** Msasani Road: A Non-fixed Pond and Pot Holes  
*Source: Daily News, February 2nd, 1985*

### 5.5 A Sigh of Relief: Critical Repairs of Dar es Salaam Infrastructure in 1992-1993

In April 1992, the Prime Minister of Tanzania and the First Vice-President, John Malecela, announced two year-long infrastructure repairs in the city of Dar es Salaam. The repairs were under a project which was known as the Dar es Salaam Roads Improvement and Maintenance Project (DRIMP).<sup>103</sup> The actual repairs had, however, begun in January 1992. The decision came after long cries from the public and newspapers to the city and government over the poor state of infrastructure, especially roads, the water system, sewerage and surface drainage. Solid waste, about which citizens and the papers complained much, also received great attention. The main focus of the repair works was on paved roads. The then City Director, Evarist Kwebwa, remarked that “there are 1115 kilometres of paved roads in Dar es Salaam . . . the current rehabilitation won’t go beyond 200 km.”<sup>104</sup> Undertaken with a Japanese grant, the first-year repairs covered the CBD, Morocco, Kinondoni and Mwinjuma roads. They also involved fixing the blockage of the CBD combined drainage system and changing pipes in the damaged sections of the system. The second year covered the Upanga, Shekilango, Kilwa, Morogoro and New Bagamoyo roads.<sup>105</sup> While the road repairs were supervised by the City Council on behalf of the government, the drainage repairs were supervised by the Dar es Salaam Sewage and Sanitation Drainage (DSSD).<sup>106</sup> Despite fixing the CBD and critical roads, the state daily paper, the *Daily News*, acclaimed the move with a headline which read: “Dar Roads Facelift Takes Off at Last!”<sup>107</sup> Probably this sigh represented the feelings of many road users in the nation’s leading city.

The sigh was accompanied by a series of headlines and news stories giving details of engineering companies, pictures of the companies repairing the roads in different parts of the city or the combined drainage system in the system, pictures of food vendors who benefited from the repairs by selling food to the engineers and their lower-level workers as well as details from the government and the City Council about the breadth of, and reasons for, the repairs. With regard to the reasons for the repairs or rehabilitation as the papers called them, the papers learnt from government circles that the repairs were for improving the state of infrastructure in the city. In particular, the government wanted to deal with flooding in certain streets by improving the drainage of both sewerage and storm water because it was causing road destruction, traffic jams and trouble to pedestrians (see Figure 5.8 below). The areas included those around the CBD and the Kariakoo

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<sup>103</sup> *Daily News*, 11.09.1992.

<sup>104</sup> *Daily News*, 09.05.1992.

<sup>105</sup> *Daily News*, 19.12.1992.

<sup>106</sup> *Daily News*, 24.01.1992.

<sup>107</sup> *Daily News*, 15.01.1992.

market, which faced occasional floods, and the Shekilango road.<sup>108</sup> The Minister of State in the Prime Minister's Office, Anna Abdallah, offered more justifications for the repairs, saying:

The state of city roads and other infrastructures needs no elaboration. It cannot be anything other than being pathetic. Dar es Salaam is the mirror of our country. What people and visitors see in Dar es Salaam is the image of the whole Tanzania.<sup>109</sup>

The DRIMP project saw four civil engineering companies being involved in the repairs. The roads in the CBD and some critical roads were given to a Japanese company – KONOIKE. The firm got the lion's share of the project, which was funded by the Japanese government. This was not the first time the Japanese government demanded a Japanese firm to play a leading role in project undertaking with a Japanese grant. Just a decade earlier, another Japanese firm, KAJIMA, had been granted a tender for constructing a new two-lane Selander Bridge that had been bombed and partially destroyed in 1981.<sup>110</sup> The construction of the Selander Bridge and repairs of the United Nations Road had been funded by the Japanese government. The government of Tanzania argued in favour of granting the construction tender to KAJIMA “due to the shortage of experienced local contractors.”<sup>111</sup> The 1980s and 1990s road repair projects acted as a gateway for Japanese engineering firms to penetrate the Tanzanian market. Previously, the works had been monopolised by European and American firms.<sup>112</sup> This means that the Global South construction and repair sites were not only the site of technological performance but also of technological rivalries between the Global North nations. Each nation gained monopoly in engineering projects if they funded them, especially in the period between the 1960s and 2000. This explains why the appropriation of engineering technologies in the Global South seems to have been successful theoretically but not practically.

Apart from KONOIKE, there were three other local firms which were given smaller repair tasks. Two such firms, BECCO and UNICO, belonged to Asian Tanzanians. MECCO was the only and last state firm that was given some roads to repair in the DRIMP project. The drains of the combined drainage system in the CBD were replaced in many parts because they were clogged with silt. The clogging was caused by non-maintenance of a system which was built in the 1950s. With replacements taking longer, the drainage repairs caused traffic problems in the CBD. Had the system been installed all over the city, there would have been citywide replacements. Whereas in the CBD both drainage and roads were repaired, in other parts of the city the work involved fixing potholes, consolidating eroded road surfaces and upgrading certain parts of the roads. Drainage

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<sup>108</sup> *Daily News*, 22.09.1992; *Daily News*, 28.09.1992.

<sup>109</sup> *Daily News*, 09.05.1992.

<sup>110</sup> *Daily News*, 15.04.1982.

<sup>111</sup> URT, *The Economic Survey of 1981/82*.

<sup>112</sup> For some American and European firms see Jamie Monson, *Africa's Freedom Railway* (Indianapolis: Indiana University Press, 2010).

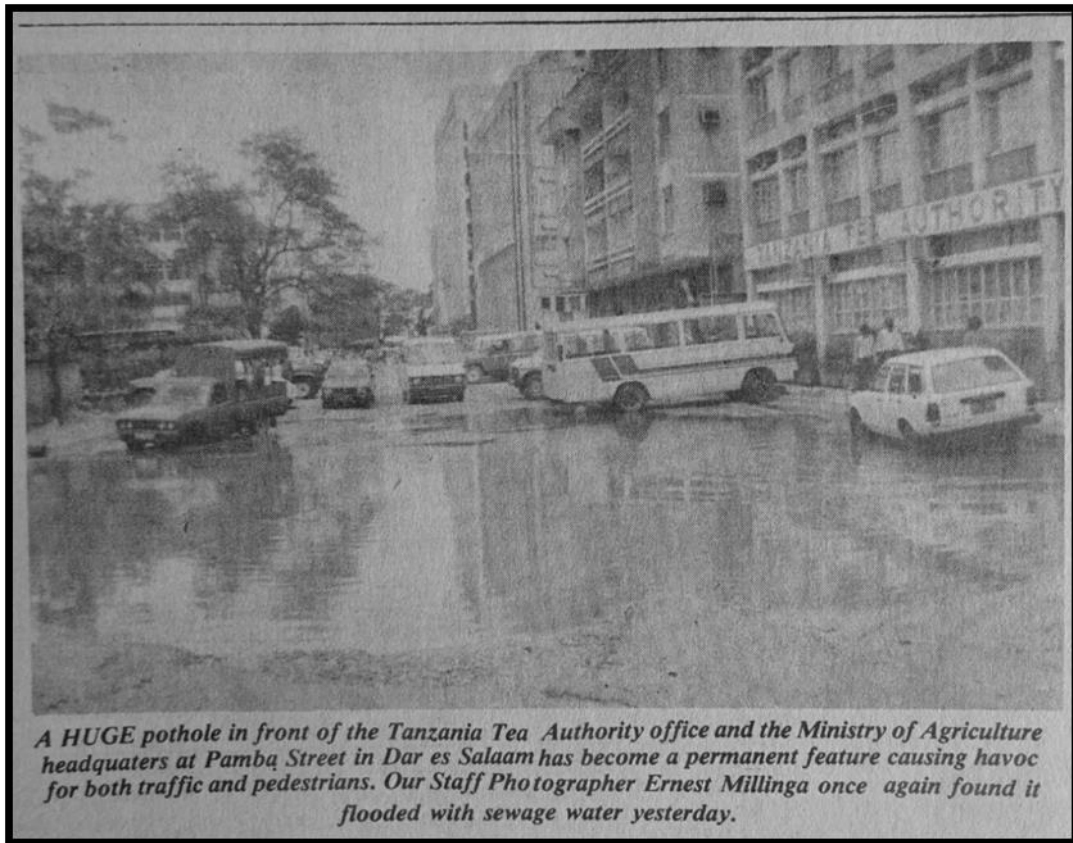
was only fixed in parts which were considered as intersections between traffic and natural water pathways. This means that the focus was on ensuring the road surfaces were smooth again for motorists to ride with ease. For a vulnerable traffic infrastructure to last longer and withstand stormwater, it needed a parallel installation of a drainage infrastructure. Unfortunately, drainage installation was put in the hindsight, a situation that has been the case up to the end of the first decade of the 21<sup>st</sup> century.

There was a significant change in the appearance of Dar es Salaam roads by the end of 1993 because of the DRIMP project. Thanks to the Japanese government, because until the dissolution of the City Council, the Tanzanian government had not disbursed funds from its own coffers for carrying out infrastructural repairs. Some members of the public, as letters to the editor reveal, were enthralled with the rehabilitation works done in the city and congratulated the government.<sup>113</sup> Others “ask[ed] the Ministry of Works to tell the public [the] reasons which hamper the performance of local construction firms.”<sup>114</sup> Questions like that were asked after the public learnt that, during the repairs the Japanese firm – KONOIKE – had had the lion’s share of the road works, yet it built faster, better and without delays or complaints, unlike the three local firms, which had a single road each. No response was given, but it could not have been possible for the ministry to reveal the conditions of the technical aid. Had the ministry responded, probably it would have talked about local firms lacking experience, qualified manpower, limited capital, a shortage of construction machinery, poor designs and the like as it was the case in the 1960s, 1970s and 1980s. However, the DRIMP project had left a big percentage of the city street roads unfixed. After the DRIMP project, the state and party papers reported fewer city road problems, except during the rainy season. The cry of other streets, especially those in densely populated areas, had to wait for privately-owned papers to emerge from 1995 to attract the attention of the state. The private papers gained an ally: the multiparty politics, which also began in the 1990s. Thus, when the state was addressing city infrastructure problems through decisions like the 1996 City Council dissolution, it was responding not only to the pressure from its own papers and the public but also to the pressure from the opposition parties and the increasingly dominant private media.

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<sup>113</sup> See Underson, Stella, “Use Dar Roads Carefully”, *Daily News*, 21.11.1992.

<sup>114</sup> See Butingo, Elias, “Ministry and City Roads”, *Daily News*, 21.11.1992; *Daily News*, 12.11.1992.



**Figure 5.8:** Newspapers and the State of Roads in the CBD, Dar es Salaam, 1992

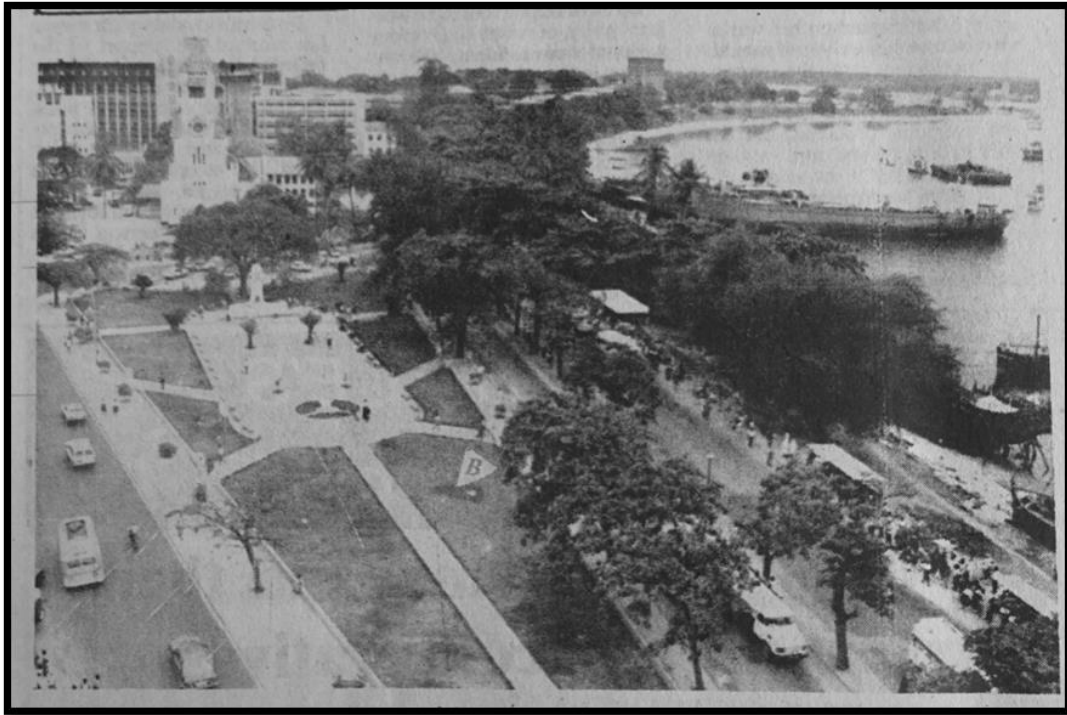
*Sources: Daily News, 17.09.1992*



**Figure 5.9:** Major Repairs of Combined Drainage in 1992

*Source: Daily News, 24.01.1992*





**Figure 5.10:** The City Garden after Repairs in 1992  
*Source: Daily News, 03.11.1992*

## 5.6 Conclusion

The 1968 and 1979 master plans were not only modernist blueprints made by experts from the West, but were also suggestions for improving the state of surface drains and for building new ones to reduce the impact of perennial flooding in Dar es Salaam City. Had they been fully implemented, street flooding would have been controlled to some extent in the older parts of the city and to a large extent in the newer ones. However modernist the master plans looked, it does not mean that no one in government supported them. The Dodoma National Capital Master Plan, which was not fully implemented either, was criticised by many leaders, except for the President and the Chairman of Capital Development Authority.<sup>115</sup> Their failure not should be construed within this context of being too ambitious or modest projects. Rather, they should be articulated in a context of competing decision-making regimes, shortage of technical manpower, emphasis on national industrial goals, the economic crisis and the influence of technical aid. Their failure cemented the continuity of flooding in the streets which began in the colonial era.

Secondly, we argue that the period between 1968 and 1999 was largely a period of infrastructural decay in the city, decay that was a brainchild of the continuity of colonial and post-colonial structural urban governance limitations, the national economic crisis, the lack of a culture of maintaining and repairing infrastructure and the presence of limited few national engineering and planning experts. As such, it was long-term and complex decay. It is a period in which the city

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<sup>115</sup> Kahama, *Sir George*, 81.

administration was incompetent and weak because it lacked the critical manpower for urban governance. Furthermore, it is a period in which the city was not allowed to evolve its own niche in governance. It could not develop significant income projects, both generating and modernisation projects.

The drawbacks to the city governance occurred in three ways. First, the city was under the constant eyes of the central government through the Ministry of Regional Administration and Local Government, which paid huge attention to its day-to-day activities. In simple terms, it turned out to be like an individual who was renting a house whose landlord oversees and approves everything the tenant does to or in the house. The City Council, thus, lost autonomy. This explains why most of the activities, which are globally understood to be under the jurisdiction of city authorities, were done by the central government. The provision of housing and urban infrastructure, for instance, was done by the central government. The City Council was eschewing infrastructure building either because it had no financial resources or because it was used to seeing the state build as it always did. This situation led to limbo during the implementation of master plans, especially the 1968 plan, which was implemented at least by 40%. Dar es Salaam was not experiencing this alone. T P N Kyaruzi, Musoma Town Director, wrote to the PS in the Prime Minister's Office, seeking an explanation about who was responsible for surveying land and allocating residential plots to people. The ruling party had said on 30.10.1978 that it was the urban councils that were responsible for doing that. However, the PS in the Ministry of Lands, Housing and Urban Development denounced the statement two days later, saying it was the ministry that was responsible for doing that, and not the urban councils'.<sup>116</sup> The matter resurfaced again in 1982 when the *African Contemporary Record* reported the existence of "confusion on site allocation jurisdiction between urban authorities and the Ministry of Lands has led to numerous complaints."<sup>117</sup> This means that there was limbo caused by the overlap of jurisdictions. However, this limbo did not occur accidentally. Between 1961 and 1974, Dar es Salaam was the *de jure* national capital, the face of Tanzania that attracted the attention of senior government leaders. Beginning 1974, it was the *de facto* capital of Tanzania as only Parliament and the Prime Minister had moved to Dodoma. The state house, ministries, critical government departments, embassies, UN agencies and the headquarters of other local and international agencies and companies were still in Dar es Salaam. A recent study by Cambridge historian, George Roberts, adds that Dar es Salaam was also a capital of revolutionary movements in sub-Saharan Africa.<sup>118</sup>

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<sup>116</sup> Letter from Musoma Town Director to PS of Prime Minister's Office dated 15.11.1978 in CZNA, PM/VA/8/4: Report of Urban Authority.

<sup>117</sup> *Africa Contemporary Record: Annual Survey and Documents 1981-1982*, B292.

<sup>118</sup> George Roberts, *Revolutionary State-Making in Dar es Salaam: African Liberation and the Global Cold War, 1961-1974* (Cambridge: Cambridge University Press, 2021).

Another drawback occurred through the decentralisation of local government, which affected Dar es Salaam and other urban councils. When the City Council was dissolved in 1972, the governance of the city was left in the hands of unelected political leaders, who were overwhelmed by political and development issues of both the rural and urban areas. With the country increasingly leaning on rural policy in development, the leaders had to pay due attention to rural issues by default. Decentralisation nipped in the bud the rise of professionals in urban governance and this also played some role in derailing the development of Dar es Salaam as well as the implementation of master plans. The last drawback occurred in 1996 when the central government stopped playing its role in wilting the governance of the city. Thus, the Prime Minister dissolved the City Council under the pretext that it was failing to deliver social services, the city was becoming dirtier day by day and that its administration was corrupt. The culprit was the judge who was blaming his own mistakes on others. The City Council was not active until 2001.<sup>119</sup> During that time the city administration was under the City Commission, formed and funded by the central government. The commission received all the resources and cooperation which the City Council lacked. In the two government administrative interventions, the people of Dar es Salaam were not represented. Hence, infrastructure and other urban issues were dealt with using a top-down decision-making system.

There was a difference in the two interventions, however. The 1972 intervention worsened the provision of urban services because there were contested layers of priorities and governance that made the city lack the necessary resources and focus. The opposite was true in 1996 when the government responded to all concerns raised by the Commission which was led by people who were committed and experienced in urban governance. Infrastructural services improved significantly under the administration of the City Commission. Therefore, the ups and downs pertaining to technical matters of infrastructural development occurred in a political context which had its own ups and downs. The developments in technological and political terrains reflected global dynamics and were affected by lack of critical educated manpower as well as the absence of coordination and articulation of what was planned and implemented. As such, the failure of master plans and national development plans with respect to infrastructure in Dar es Salaam, particularly traffic and drainage infrastructure, in Dar es Salaam should not be analysed with unilinear and simplistic lenses.

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<sup>119</sup> CZNA, RALG/C.50/78: D'Salaam City Commission; Letter from Permanent Secretary for Public Service to Permanent Secretary for Prime Minister's Office dated 30.07.1997, CZNA, PM/C.170/8

## CHAPTER VI

### PLANNING AND ENGINEERING EDUCATION AND ITS CONNECTION TO URBAN TECHNOLOGIES IN DAR ES SALAAM

Planning and engineering disciplines were the two key disciplines that determined the design and development of infrastructure at the technical level. This chapter explains the significant contribution of urban planning and engineering sciences to shaping the urban history of Dar es Salaam from an infrastructural perspective. This discussion is of utmost importance to one seeking to understand how Dar es Salaam, and probably other Global South cities, evolved through planning, designing, constructing and maintaining urban infrastructure, particularly the drainage and traffic technical systems discussed in this thesis. The chapter begins by examining the antecedents and development of technical education in Tanzania. It then highlights the planning and engineering cultures and works in relation to Dar es Salaam. Evidence from archives and literature are used to reinforce the argument that the unprecedented flooding of planned Dar es Salaam and its resultant road destruction and traffic jams are connected with local and global contexts of planning and engineering sciences, in both theory and practice.

#### **6.1 Antecedents of Urban Planning and Engineering Culture in Tanzania**

Planning and engineering culture has two interrelated meanings in this chapter and in the rest of the thesis. First, the concept is used to describe a set of knowledge and practices that dominate the realm of planning and engineering activities. This meaning of the concept helps us to know the specific training that distinguishes a spatial planner and a civil engineer not only from other kinds of engineers and planners but also from other professionals such as medical doctors and accountants. The specific knowledge that one attains enables one to undertake certain activities that others cannot. It enables him to speak a certain kind of technical jargon, which other professionals may not use or understand. Their final products such as master city plans on the one hand, and roads, drainage and housing on the other, also distinguish them from others. The knowledge and practices acquired through training and practice, and their final products – which we label as materiality – form a professional ‘culture’. This culture evolves, depending on the spatial and temporal context of technology. Despite the differences in training and social status which professionals may acquire, the professional culture makes the actors share more than they can differ. A recent work by a Chinese historian of technology has shown how engineering cultures

have shared much through global circulation.<sup>1</sup> This sense of engineering and planning cultures is used in this work to refer to the general features of the planning and engineering professions that differentiate their actors and work from those of other professions.

A second sense of engineering and planning cultures focuses on intra-professional variations. Here, we refer to specific sets of knowledge and practices in infrastructure engineering that can distinguish the design and building of the same infrastructure from one place to another, and one group of engineers from another. This intra-professional variation is also available in spatial planning. What influences variations in the profession can be training<sup>2</sup>, politics<sup>3</sup> or culture.<sup>4</sup> With regard to training, a historian of technology, Judith Schueler, argues that the training of an engineer takes place within a certain cultural milieu. The engineer is likely to adopt cultural embodiments during his training which will influence work efficiency and the final products. Schueler cites the case of Austrian engineers who had developed a school of tunnel engineering in the mid-19<sup>th</sup> century. The Austrian engineers developed the scientification of tunnelling under Franz Ržiha whose ideals were shared in an engineering journal and universities. The consequence was that the Austrian engineers were resistant to adopt tunnelling methods other than what they had been trained in. They fused tunnelling culture with politico-economic interests by trying to sell Austrian engineering practices and engineers across Central Europe at a moment during an economic crisis.<sup>5</sup>

The Austrian tunnelling cultures surfaced during the construction of the Swiss Gotthard Tunnel between the late 1860s and early 1880s. According to Schueler, Gotthard was being constructed by a Swiss Louis Favre, who employed the Belgian tunnelling method. The method was more practice-oriented. It involved digging and constructing the tunnel roof first. The method was hazardous to workers. By contrast, the Austrian method was more theoretical than practical, digging and building from the tunnel bottom up. When Ržiha visited the Gottard tunnelling as a professor of tunnel engineering in 1875, he abhorred the Belgian method and called for the adoption of the Austrian method.<sup>6</sup> His decision complicated the Gottard tunnelling because it caused a conflict between the German and Swiss engineers at the site. It also raised alarm among other tunnelling engineers on the efficiency of the Belgian method.<sup>7</sup> Schueler says that the Swiss

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<sup>1</sup> Anyi Wang “Development and Integration: The History of Engineers in the People’s Republic of China, 1949-1989” (PhD thesis, Technische Universität Berlin, 2015), 1-15.

<sup>2</sup> J.A. Schueler, *Materialising Identity: The Co-construction of the Gotthard Railway and Swiss National Identity* (Eindhoven: Technische Universiteit Eindhoven, 2008), 41-47.

<sup>3</sup> See the case of Chinese emulation of great powers technological success in Op. Cit.

<sup>4</sup> Hård, Hecht and Dinobl cited in Schueler, *Materialising Identity*, 38.

<sup>5</sup> *Ibid.*

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

<sup>7</sup> *Ibid.*, 36.

20<sup>th</sup> century engineers came to consider Favre as the father of Swiss engineering culture because he tinkered around to develop methods that would stop Swiss engineers from using Austrian, German, Italian and Belgian methods. This means that there is a thin line between cultural and training factors in the development of a certain technological style or culture. Schueler, citing Hecht, notes that, during the post-Second World War, France developed nuclear power. The development of nuclear power in France was dependent on “a regime in which the politicized technical environment and the technocratic political environment influenced each other.”<sup>8</sup> The justification for developing nuclear power came from French ideologies, legends, technologists, institutions and the general public to delineate it from other countries as a nuclear power. They invoked Frenchness for political reasons. It was under such circumstances that certain technologies developed their cultures or styles. Thus, it is hard to separate technology from politics and culture.

The evolution of planning and engineering cultures in Tanzania is explicitly connected with the onset of urban planning and engineering projects beginning in the last decade of the 19<sup>th</sup> century. It was within the colonial context – colonial context in the sense of temporality, physicality and spatiality – the urban settings were planned. The first urban settings to be planned in Tanzania were Dar es Salaam and Tanga. The reasons for planning the two towns were: the former was the seat of government and the latter the hub of settler capital and concentration. As such, the towns had more political and economic significances to the German imperial authority than the other towns in the territory.<sup>9</sup> Writing derogatorily in 1917 to affirm the Germans’ civilisation narrative, a historian of German East Africa, Albert Calvert, praised the Germans for transforming “the dirty negro villages of Dar es Salaam and Tanga into substantial and imposing towns.”<sup>10</sup> Planning and infrastructure development of the two towns characterised the interwar British urban development in Tanganyika. A good example was the provision of township plots<sup>11</sup> and anti-malarial drainage<sup>12</sup> for only the two towns. The other towns started attracting similar attention after WWII. The alleged transformation of the villages into towns was defined by population figures. By 1891, Dar es Salaam had about 3000 inhabitants, but it had about 70,000 inhabitants by 1949. By simple statistical estimates, the city might have had an annual population growth of about 1,117 people between 1891 and 1947. As such, the population growth and cosmopolitanism that ensued was trivialised

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<sup>8</sup> Schueler, *Materialising Identity*, 37.

<sup>9</sup> Jürgen Becher, *Dar es Salaam, Tanga und Tabora: Stadtentwicklung in Tansania unter deutscher Kolonialherrschaft* (Stuttgart: Franz Steiner, 1997).

<sup>10</sup> Albert F. Calvert, *German East Africa* (London: T. Werner Laurie Ltd., 1917), xviii.

<sup>11</sup> See for instance in Tanganyika Territory, *Report for the Department of Land Survey and Mines for the Year Ended 31<sup>st</sup> December, 1923* (Dar es Salaam: the Government Printer, 1924), 4.

<sup>12</sup> The concentration of anti-malarial drainage programmes in Tanga and Dar es Salaam is documented in the following archival records: BNA, CO691/170/8: Tanganyika – Malaria Research Schemes 1939; BNA, CO691/144/13: Tanganyika – Sewerage Schemes 1935; BNA, CO691/140/13: Tanganyika Sewerage Schemes 1934.

aspect of urban change in favour of a new set of economic activities. The second key transformative factor was the detailed and structured urban plans drawn up by the German planners for the two towns. As shown in the previous chapters, the plans were in indeed impactful with respect to the relationship between the environment and people, and between people themselves. Epistemically, there were new forms of knowledge about nature and new authority on how to control nature. Borrowing the conception of nature from the historian of technology, David Nye, and from a revisionist environmental historian, Steven Vogel, we can say that nature can no longer be dogmatically understood as the pristine, undisturbed by human action and the naturally occurring environments. Nature is now not only the wilderness but also the built environment, which has influenced the rise of new relations between men and men, and between men and the built nature.<sup>13</sup> This new conceptualisation of nature presents a radical change in the philosophy of environmental history but not in the history of technology, because the latter has for long focused on men's activities demonstrated through new knowledge and materiality. Urban plans, designs and infrastructure are examples of the knowledge and materiality that elaborate the other nature suggested by Nye and Vogel.

According to the French historian of science and technology, Christophe Benneuil, “scientific knowledge and artefacts travel only with their ecologies.”<sup>14</sup> However, due to local conditions, such circulation of “scientific knowledge and artefacts” cannot be guaranteed in most cases or cannot remain unaltered. The urban planners brought the German urban spatial relations, arrangements and control into the African context. Due to limitations on the availability of resources and the specific situations in the planned areas, the plans could not be used to produce an exact replica of the metropolitan German spatio-temporal conditions. They had to be adapted to local conditions by undergoing a number of modifications. In the history of science and technology, modifications intended to make something suitable for local conditions after it had circulated from one place to another are analytically referred to as appropriation.<sup>15</sup> It is for that reason that the two analytical concepts are the key concepts throughout this thesis.

The appropriation of urban planning in Tanzania was done on paper. While it has been stated in Chapters III and IV of this thesis that the British colonial plans for Dar es Salaam, produced in 1929 and 1949, were made by engineers from PWD and the Alexander Gibb & Partners, respectively: it is not clear which professional group actually produced the first, second

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<sup>13</sup> David E. Nye, *American as Second Creation: Technology and Narratives of New Beginnings* (Cambridge: The MIT Press, 2004); Steven Vogel, *Thinking Like a Mall: Environmental Philosophy after the End of Nature* (Cambridge: The MIT Press, 2015), 1-31.

<sup>14</sup> Christophe Benneuil, “Development as Experiment: Science and State Building in Late Colonial and Postcolonial Africa, 1930-1970”, *Osiris* 15 (2000), 272.

<sup>15</sup> Kurt Beck, Gabriel Klaeger and Michael Stasik, “An Introduction to the African Road” in *The Making of the African Road* edited by Kurt Beck, Gabriel Klaeger and Michael Stasik (Leiden and Boston: Brill, 2017).

and third master plans for Dar es Salaam during the German colonial period. It can only be noted that the producers were the German colonial administrators. The two British plans were an innovation through the refinement and expansion of the German plans. Since planning traditions and practices were circulating in the Global North, it is likely that the German administrators who planned Dar es Salaam and Tanga had received some training in engineering. The reason behind this statement is that the contemporary Global North had not effectively developed an urban planning discipline. There were only a few individuals with some background in engineering who were planning major cities in the Global North. The other reason is that, up to 1950, modern Tanzania had neither a department of urban planning nor trained urban planners.<sup>16</sup> Furthermore, the 1949 master plan for Dar es Salaam was produced by a civil engineer. According to the 1950 PWD annual report, Sir Alexander Gibb and Partners – who produced the plan – were given the task of constructing the major highways of Tanganyika. They included the Dar es Salaam-Morogoro road, the Namanga-Taveta road and the Dar es Salaam and Mtwara airports. They were also responsible for designing and constructing parts of the Dar es Salaam and Mtwara water supply systems.<sup>17</sup>

The German and British colonial authorities utilised their nationals to execute planning and engineering works. In developing plans, the locals, or ‘natives’ as they were called in the colonial official correspondences, were not involved in planning surveys or other opinion-gathering methods. It is legitimate to believe that their involvement was a precursor of the top-down approach in planning, a characteristic feature of both the colonial and post-colonial spatial plans. Up to the late 1950s, the colonial authorities had not trained natives in planning and engineering. As was shown in the previous chapters, the Tanzanian labour force in the planning and engineering units was reduced to mere manual, casual and unskilled labour who were invariably employed on a temporary basis and who did not have any ‘post-job’ benefits. Furthermore, in the annual reports of the units, the natives were either not mentioned as employees or were called manual labourers or labour gangs. As such, Tanzanians were made to feel outsiders in the projects that they were implementing. They were also made to believe that technical materialities and activities were esoteric affairs of the whites from the Global North and the Indians. Since most of the labourers could hardly read and write as a result of colonial education bias, it was inevitable that Africans would be unskilled in technical works related to infrastructural planning and engineering. Thus,

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<sup>16</sup> Tanganyika Territory, *A Plan for Dar es Salaam: Report* (London, Nairobi and Dar es Salaam: Alexander Gibb & Partners, 1949), 155.

<sup>17</sup> Tanganyika Territory, *Annual Report of the Public Works Department 1950* (Dar es Salaam: the Government Printer, 1951), 2; Sir Alexander Gibb & Partners were awarded similar tasks as early as 1947. See in United Kingdom, *Report to the General Assembly of the United Nations on the Administration of Tanganyika for the Year 1947* (London: His Majesty’s Stationery Office, 1948), 43.



during independence in 1961, Tanganyika did not have even a single local planner or engineer. A research trip to the Institution of Civil Engineers in London, UK – where a significant number of the records for the engineers who worked in the British Empire is available – did not uncover any substantial records of Alexander Gibb and Partners or other engineers who worked in Tanganyika. Hence, it is not clear whether these civil engineers had additional training in urban or spatial planning, because they developed a plan for Dar es Salaam and another for Mtwara town.<sup>18</sup> In the master plans, they demonstrated a good command of planning concepts that were novel in the contemporary Global North. Nonetheless, they surveyed land and designed more engineering projects, for example projects for highways and water provision, than urban plans. As these spatial planners were also performing engineering tasks, there was a thin line between engineering and planning sciences in the colonial context.

A vast historical literature on the Global South, particularly on African history, is full of accounts showing that colonialism provided room for master-servant relations to prosper along the racial and gendered lines. In housing plans, as indicated in the 1949 Dar es Salaam plan, the master-servant relations could be seen in the allocation of residential areas. It was stated that European residential areas should be close to African “Boys” quarters so that the distance to the Africans who worked as servants in European homes could be reduced.<sup>19</sup> The “Boys” quarters were mainly composed of one or two rooms and a veranda because it was assumed that African servants were bachelors. After all, they were all men and the Europeans knew that they had families in their native lands outside the city. ‘The cities for men’ narrative was a corollary of this master-servant binary because the colonial officers and projects employed more African men than women. Such a binary was also extended to engineering and planning departments, where all technical or white-collar jobs were the preserve of Europeans, and to some extent, the Asians as well, whereas all manual and least technical jobs were the preserve of Africans. The Europeans and Asians sent their children abroad for technical education. In work sites, Africans were similar to labour gangs, while the Europeans and Asians were the technocrats and supervisors of the labour gangs. Thus, the master-servant dichotomy was witnessed on all levels of planning, designing, engineering and implementing the drainage and traffic projects.

There were unforeseen consequences of that racial and gendered division of labour. Women of all three races were conspicuously absent from planning and engineering works throughout the colonial era. Jill Wells, a development economist, examined the work conditions for the manual labourers in post-colonial Dar es Salaam. Her exposition uncovered that, despite

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<sup>18</sup> Tanganyika, *Plan of Dar es Salaam*, 125.

<sup>19</sup> *Ibid.*, 39.

the fact that there were a limited number of local and foreign civil engineering companies, “much of the construction programme was undertaken by direct labour” during the period from 1961 to 1990s.<sup>20</sup> She argues that it was the failure of the government that led to much work being handled by male manual labourers than by the professional personnel or engineering firms. She does not see it as being connected to the colonial division of labour and the education system which confined Africans to less technical works. We argue that it was not merely a legacy of the colonial division of labour and education, but rather also largely a continuity and appropriation of the colonial labour-intensive engineering. A good example is provided by Wells as she points out that every central and local government body had its own building section composed of only less skilled workers. It is continuity because it was the manual workers who did much work in most infrastructural projects. It was appropriation because it was now formalised particularly in the recruitment and maintenance of workers. Workers could now be listed among the permanent employees of their working government units and departments, in both the central and local governments. Workers were assured of getting retirement benefits, thus ending the colonial casualty. Labour-intensive technologies were, however, viewed by the government as being inimical to the manufacturing sector in the 1980s, since they led to low productivity.<sup>21</sup>

As the critics of early post-colonial Tanzania and the retrieved archival records reveal, the young country adopted the ‘Africanisation’ programme to train Tanzanians in ‘technical professions’ so that they could replace the expatriates from Britain, who formed the core of virtually all technical functions in the country. Since the training of Africans would not have taken a short time and because it needed larger educational system reforms, it is not surprising that many technical projects and activities relied on foreign professionals and less skilled nationals. The shortage of qualified technical staff, which characterised many government departments during the post-colonial era, was caused by the colonial-postcolonial transition<sup>22</sup> and the inheritance of a recurrent shortage, a dominant feature of colonialism in Tanzania. Thus, when the country adopted the 5-year development model, a model then popular in socialist countries, one of the issues it sought to address was reduction of the shortage of technical staff, both local and foreign, by producing its national technical manpower. In the First Five-Year Development Plan for Tanganyika, for instance, it was stated that the country “envisages that . . . by 1980 Tanganyika will not have to rely upon external assistance except for employees requiring exceptional

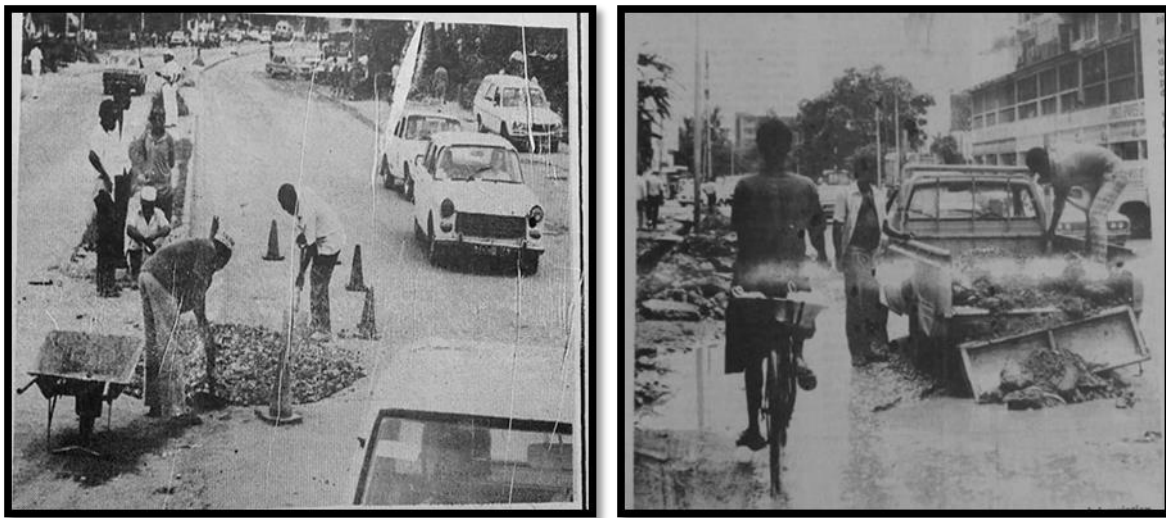
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<sup>20</sup> Jill Wells, “Dar es Salaam” in R. Lawrence & E. Werna, eds., *Labour Conditions for Construction: Decent Work, Build Cities and the Role of Local Authorities* (West Sussex: Wiley-Blackwell, 2009), 141-199.

<sup>21</sup> JMT, *Majadiliano ya Bunge (Hansard): Taarifa Rasmi, 23 Juni-27 Juni, 1981*.

<sup>22</sup> See, for instance, the shortage reported in the annual reports for the Town Planning Division from 1961 to 1968.

qualifications.<sup>23</sup> However, by the 1990s that objective had not been achieved yet, partly because of the appropriation of the labour-intensive engineering system and of the economic crisis discussed in Chapter V. The use of labour-intensive technologies in the construction and maintenance of infrastructure was not limited to traffic and drainage infrastructure alone. It was also a common scenario in other kinds of infrastructure like railways, as shown in Figure 6.2 below. The broader implication of this is that the crisis and the appropriation of labour-intensive cultures limited technological circulation and innovation. For example, technologies remained the same for a long time, while in other parts of the world changes were happening fast. Below are two pictures showing emblematic maintenance and repair of Dar es Salaam roads in the 1990s; the pictures have been retrieved from daily and weekly newspapers.<sup>24</sup>



**Figure 6.1:** State and Ad hoc Private Repair of Public Roads in Dar es Salaam in the 1990s

*Source: Daily News and Uhuru, 1991*

For a long time, the Dar es Salaam City Council relied on foreign planners and engineers to execute its various infrastructural activities and projects. Reliance on foreign staff was not the only problem. The acute shortage of staff made technical activities very wearing. For instance, in a letter dated 14<sup>th</sup> April 1966 from the City Engineer, Mr H Hechtenberg – an expatriate engineer from the then West Germany – to the City Council, which supported the recruitment of the City Development Control Officer, it was regretted that “Dar es Salaam is a rapidly growing city, with many Engineering and Planning problems, and . . . at times, the shortage of qualified technical staff has made duties particularly onerous.”<sup>25</sup> Thus, the narrative about the shortage of experts was not

<sup>23</sup> URT, *First Five-Year Development Plan of Tanganyika, July 1964 to June 1969* (Dar es Salaam: Ministry of Development Planning, 1964), 70.

<sup>24</sup> *Mzalendo*, 08.04.1990; *Daily News*, 23.03.1990.

<sup>25</sup> CNZA, LGSC/E.10/1/53: Establishment of Dar es Salaam City Council Vol. II

only structural but also persistent and functional, since it ‘supported’ the employment of technical staff for the engineering unit in the City Council.



**Figure 6.2:** Labour-Intensive Technologies in Railway Repair and Maintenance in Dar es Salaam  
*Source: Daily News, 11.03.1986*

The post-colonial shortage of local engineers and planners was a continuation of the shortage of technical experts which began in the colonial era. In 1913, the Germans had to temporarily employ an American drainage engineer, Dr A J Orenstein, to examine the Dar es Salaam anti-malarial drainage. Dr Orenstein produced a detailed report which implicitly called for the creation of a permanent position of anti-malarial engineer. As the First World War loomed, however, the report was never implemented. Upon taking over control of Dar es Salaam, the British read Orenstein’s report and tried to tinker with its implementation through medical doctors, the first administrator-cum-engineers of Dar es Salaam.<sup>26</sup> The report was studied in 1919.<sup>27</sup> In 1922, the District Commissioner, F W Brett, complained about the failure to implement the report because “no money has been allowed for this necessary work”.<sup>28</sup> The use of medical officers as engineers and administrators reveals the expert shortage British Tanganyika had. This shortage affected most public works so much that there were moments when the Governor sought to utilise railway engineers in non-railway building projects. The Governor had to solicit the Colonial Office

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<sup>26</sup> It is James Brennan’s statement that “Medical officers were the first urban administrators”. See James R. Brennan, “Nation, Race and Urbanization in Dar es Salaam, Tanzania, 1916-1976” (PhD Diss., Northwestern University, 2002), 23.

<sup>27</sup> TNA, 450/39/10: Report by Dr. Orenstein on Dar es Salaam.

<sup>28</sup> TNA Open Accession: Tanganyika Territory, Annual Report for Dar es Salaam 1921, 6.

in London to sanction the training of civil and railway engineers so that they could be used interchangeably, given the colonial circumstances. The desire to merge railway and civil engineering seems to have stemmed either from the inability of railway engineers to deal with the absence of railway infrastructure in urban areas or from the cost of employing separate engineers in a colony. However, in a letter dated 1.11.1924 from the Principal Secretary of State for the Colonies to the Governor of Tanganyika, the latter's suggestion to merge railway and civil engineering cultures was declined.<sup>29</sup> By cultures, in this work, we mean exclusive knowledge and practices of a certain profession and its actors. Had it been approved, the suggestion would have marked the first achievement in merging engineering cultures in Tanganyika. It is likely that the rejection was one of the underlying reasons for the establishment of the Public Works Department in 1925; the department became independent of the railway engineers.

The quest for combining railway and engineering cultures in Tanganyika did not end in 1924. There can be an overlap between engineering cultures. For instance, in the drainage and traffic engineering cultures, they follow the basic civil engineering knowledge and practices. They differ slightly in how they finish their projects. In the period between 1927 and 1929, there were several attempts to merge medical and civil engineering cultures. 'Medical engineering' is a makeshift construct which sought to describe the whole range of planning and engineering activities related to anti-malarial drainage in colonial Tanganyika and elsewhere in the contemporary Global South. The official colonial records of the early 1920s show that medical engineering was known as 'sanitary engineering' in order to broaden the functions of sanitary engineers. In a recommendation letter of 1927 for the recruitment of a sanitary engineer for Dar es Salaam, Dr Orenstein stated the functions of sanitary engineers as being "advising the proper Departments on water supplies, sewage disposal, engineer control for mosquito breeding, slaughter houses, public laundries and other similar matters."<sup>30</sup> As such, this kind of engineer needed civil engineering and medical skills. The difference between the sanitary engineer and the medical officer who acted as sanitary engineers before the mid-1920s is that the former was a professional engineer and the latter a professional medical officer. Each employed applied knowledge of the other discipline. The sanitary engineer was, however, an official position recognised within the official hierarchies of administration, whereas the medical officer who employed some applied engineering knowledge or skills was officially recognised for only his medical skills. In other words, the blending of medical and civil engineering cultures under the sanitary engineer was a colonial formal construct. No wonder then that between 1926 and 1930 the position of sanitary engineer existed in the colonial

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<sup>29</sup> BNA, CO323/918/1: Tanganyika Territory – Railway and Public Works Department.

<sup>30</sup> TNA, 450/46/8: Sanitary Engineer.

structures and correspondences. It is important to note that the medical officers who acted as sanitary engineers had administrative responsibilities in the city first as township executive officers in the 1920s and as municipal secretaries in the early 1930s. This shows how medical officers wielded power and knowledge, apart from their technical knowledge, and more duties than the typical sanitary engineers.

In a letter from the Acting Director of Medical Services to the Acting Director of Public Works (DPW), the recruitment of a sanitary engineer was endorsed subject to approval by the Governor as per Dr Orenstein recommendations.<sup>31</sup> However, after consultation with the Director of Public Works, the Governor said that “an additional Executive Engineer with experience in drainage and water schemes, whose services could be utilised on such works when necessary and who could be employed at other times on general work” be recruited.<sup>32</sup> The grounds for the Governor’s position against the recruitment of a sanitary engineer was that the latter possessed only a working knowledge over drainage building and lacked the expert knowledge attained from meticulous and professional training. As a result, there were no sanitary engineers between 1927 and 1932 in the colony. Equally significant, the recommended executive engineer was not recruited until the early 1930s. Evidence shows that the recommended executive engineer was placed under the Director of Medical and Sanitary Services (DMSS) as a semi-autonomous engineer. The official title was ‘Anti-Malarial Engineer’ and the first to appear in the records under that title was Sd W M Millar in 1932.<sup>33</sup> The Anti-Malarial Engineer worked under the Medical Department. He had to develop plans, mainly anti-malarial plans, for Dar es Salaam, leaving the other functions prescribed by the Director of Public Works to either the consulting engineers like Howard Humphreys or the PWD. Although he was an engineer by profession, he performed more or less the same duties that the sanitary engineer would have performed. Administratively, the anti-malarial engineer was more crippled than the sanitary engineer in that most of his plans needed the approval of both the DMSS and DPW. Like the position of sanitary engineer, the position of anti-malarial engineer was short-lived; it was abolished at the end of the 1930s as part of administrative re-organisation in the PWD. Still, as medical engineers, the sanitary and anti-malarial engineers combined the cultures of the medical and engineering professions in their work.

The merging of the medical culture with the civil engineering culture in order to combat malaria was a colonial invention, made in Tanganyika in the 1920s. Medical engineer was first as an ad hoc post and later as a de jure post. It did not exist during the German colonial era. How did

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<sup>31</sup> *Ibid.*, letter from Ag. DMSS to Ag. DPW dated 14.04.1927.

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

<sup>33</sup> BNA, CO691/125/11: Tanganyika: Sewerage Scheme – Dar es Salaam – Loan Allocation. It is in this file that the first comprehensive drainage plan for Dar es Salaam was developed and presented for implementation. But had to wait till the 1950s when it was affected.

it find its way into Tanganyika in the latter form? The evidence cited earlier in this chapter shows that within, the Global South and the colonial context, there were medical doctors, particularly Dr A J Orenstein and Dr W D Wrightson, who were circulating their anti-malarial drainage working knowledge. The anti-malarial drainage knowledge was developed in Panama and in the Caribbean, where there were many American influences. Through their association with anti-malarial work in those two territories, Orenstein and Wrightson were so popular that they were consulted by both the German and British colonial authorities in Dar es Salaam.

The British, however, did not take those consultations lightly as they later appropriated them in their tropical medical programme. According to George Macdonald, a civil engineer, Far East and West Africa had succeeded in developing anti-malarial drainage whose work was done by medical doctors rather than engineers. The medical doctors in question were Drs Tredre, Gilrof and Sir Malcolm Watson. As such Macdonald considered their knowledge important in controlling malaria in such huge projects like the construction of the Suez Canal and the Aswan Dam. In his opinion, “anti-malarial drainage is engineering work, whether it be the provision of weep holes in drains or a large coastal drainage scheme, and engineers are better fitted to carry it out than doctors.”<sup>34</sup> This was a critique to the British imperial government, which was transferring anti-malarial activities on to the tropical medicine programme in the 1940s. It was also a wakeup call to the civil engineers that they should appropriate all engineering projects as they were the experts. The implication here is that the engineering culture was seeking to assert its monopoly of engineering activities and showing its significance above other professional cultures when it came to anti-malarial drainage. The establishment of the post of sanitary engineer and, later, that of anti-malarial engineer exclusively for professional engineers who were employing applied public health knowledge in colonial Tanganyika vindicated those who made the decision to do so. However, it seems that the drive withered away from the mid-1940s onwards as the government did not hire anti-malarial engineers.<sup>35</sup> Instead, it relied on consulting engineers from ICE or from the PWDs within the territories.

Perhaps, it is important for historians of technology to argue that the 20<sup>th</sup> century interwoven link between medicine and civil engineering was not typically a colonial development as the sources discussed above imply. To illustrate the implication of the link, it would be prudent to recall MacDonalds’ call to civil engineers:

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<sup>34</sup> George MacDonald, “Tropical Hygiene and the Engineer”, in *ICE Proceedings* (London: ICE, 1948), 290.

<sup>35</sup> The final document to mention Anti-Malarial Engineer in Tanganyika is *An Outline of Post-war Development Proposals* (Dar es Salaam: The Government Printer, 1944), 55. Retrieved in BNA Ref. no. CO691/198/8.

Just as the engineer does not hesitate to ask for medical attention for a sore finger, he should not hesitate to discuss the public health aspects of culvert levels, of seepage drainage, and the provision of outflow for subsoil water into surface drains.<sup>36</sup>

Such a statement may make readers think that the medical and engineering cultures started converging only recently. To the contrary, the literature on drainage engineering and public health reveals that the convergence began in the mid-19<sup>th</sup> century following the cholera epidemics that had swept Western societies. Recent historical studies by Amanda Thomas<sup>37</sup> and Michelle Allen-Emerson<sup>38</sup>, for example, state that the nexus developed with the rise of the “sanitary city” in Britain and other Global North countries in the 19<sup>th</sup> century. In their accounts they mention a host of actors, ranging from policy reformers such as Sir Edwin Chadwick to medical doctors like John Snow and civil engineers like Sir Joseph Bazalgette. These actors contributed incrementally, invariably through trial and error, to an understanding that containing problems like cholera epidemics demanded concerted medical and engineering efforts and measures. That is to say, neither medical doctors nor civil engineers could alone control cholera outbreaks. Whereas medical doctors would identify the cause of the disease and develop curative measures, the formidable preventive measures relied heavily on civil engineers who, according to the discovery of Sir Joseph Bazalgette in 1856, could build combined and separate drainage systems that helped to prevent contaminating water supply.<sup>39</sup> Although the colonial records did not acknowledge this background, just as ICE engineers were also silent or acted as innovators within the colonial context, we need to recapitulate by arguing that the 20<sup>th</sup> century medical-civil engineering interplay was a buffing of an old 19<sup>th</sup> century phenomenon.

The closeness of medicine and civil engineering in relation to drainage, particularly anti-malarial drainage in colonial Dar es Salaam, passed through two phases. The first was the informal phase before 1925 and the second was the post-1925 institutionalised phase. The unique character of the two phases was the requisite reliance on medical officers and civil engineers from the Global North, directly or from other colonies of the Global North powers in the Global South. This has been discussed in detail in Chapter III of this thesis under what has been described as the colonial circulation of actors, knowledge, practices and materialities. In this chapter, we seek to emphasise that the actors were inevitably the citizens of the Global North countries who did not train local actors in how to maintain the drainage systems they designed and constructed in the colonies.

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<sup>36</sup> *Ibid.*, 296.

<sup>37</sup> Amanda J. Thomas, *Cholera: The Victorian Plague* (London: Pen & Sword, 2015).

<sup>38</sup> Michelle Allen-Emerson, *Sanitary Reform in Victorian Britain: Sanitary Engineering*, Vol. 3. (London: Pickering & Chatto, 2012).

<sup>39</sup> David Butler & John W. Davies, *Urban Drainage*. 2<sup>nd</sup> Edition. (London & New York: Spon Press, 2004), 6.



Training was provided in only a handful of semi-technical jobs to Africans at the workplace, particularly machine and motor vehicle driving and repair, as has been uncovered by historian Joshua Ryan Grace.<sup>40</sup> In addition, the colonial education system did not emphasise technical education – especially engineering education – until late in the 1950s when they started establishing trade schools: only two throughout Tanzania and a single low-level technical college in Dar es Salaam. The college began enrolling students in 1958. Whereas attempts were made as late as the 1920s to train African medical assistants, nurses, orderlies and sanitary inspectors in Tanganyika, unlike in Kenya,<sup>41</sup> and emphasis was placed on providing African masses with tribal and agricultural training during the post-WWII<sup>42</sup>, no attempts were made to train them in simple civil engineering knowledge and skills. As such, borrowing from Grace’s central themes, we could argue that this made certain technologies to be perceived by Africans as European technologies such as engineering whereas technologies associated with agriculture and medicine were perceived as multi-racial technologies. The larger implication of this perception is that the medical-civil engineering interplay was bound to fail, particularly among the lower-level actors who would directly work on drainage and traffic infrastructure in their day-to-day activities. It created a precedence for the Africans to lag behind in engineering activities and its culture: they did not see it as worth training for and doing for infrastructure maintenance and repair. Thus, when the country attained independence, it did not form a strong maintenance and repair team of engineers, but established simple and small units of masons and carpenters with responsibility for building, maintaining and repairing houses and street infrastructure.

## 6.2 The Colonial Technical Pedagogy

So far, we have shown that the circulation of science and technology from the 1890s to late 1950s was mainly done through foreign engineers, with accidental or spontaneous and limited training of local junior engineers. This circulation was dependent on decisions made in Dar es Salaam, Berlin or London, and on decisions made by the local actors in the PWD and other departments like the Department of Agriculture and Health Services. The materiality level, not the knowledge level, was the main manifestation of technology. By materiality, we mean the

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<sup>40</sup> Joshua Ryan Grace, “Modernisation Bubu: Cars, Roads, and the Politics of Development in Tanzania, 1870s-1980s”. PhD Diss., 2013.

<sup>41</sup> With regard to Urban Sanitary Inspectors, for instance, it was the policy of the colonial state of Tanganyika to train Africans whereas in Kenya such posts and training were the preserve of Europeans. See TNA, 450/46/7: Urban Sanitary Inspectors, Training of.

<sup>42</sup> The agricultural and cultural education bias for Tanganyika was first ordered in 1937 by the Colonial Office. See the ‘Minutes of the Seventy-Eighth Meeting of the Advisory Committee on Education for Colonies’ held in the Colonial Office on 22.07.1937 in BNA, CO691/175/3: Tanganyika: Education in Tanganyika. Its implementation had to wait until the end of WWII, after which the 10 Year Development Plan for Education was prepared. The latter plan was, however, a reproduction of a rural and African education plan developed in 1938 by R.J. Mason, the Government Inspector of Schools in Tanganyika.

construction of infrastructure and structures by technical experts from outside a colonial territory. Dar es Salaam saw heavy investments in terms of infrastructural development because its capital status. It was in the early 1950s that the colonial Government sought to change this materiality pattern of technology – the transferred technologies of large technical systems and everyday life artefacts – by introducing the didactic part of technology through formal institutions.

In Tanganyika, the didactic part of technology was rather haphazardly, first within the critical government departments like the Public Works, Railways and Medical departments and then it became systematic with the establishment of two technical schools and one technical college to offer secondary school-level technical education. The annual reports by the United Kingdom government submitted to the United Nations between 1946 and 1950 revealed that there was some make-shift technical education at the workplace and in a few government departments. However, the kind of training provided is not described in detail, apart from the government stating that it was only the “operating and maintenance staff” who received intra-departmental training.<sup>43</sup> This training continued through the 1950s. In 1952, for instance, the British government reported to the United Nations that the core functions of the PWD were “maintenance” and “building”.<sup>44</sup> To perform these functions, the PWD needed more skilled staff. But reports of the department from as early as the 1920s to 1961 noted a persistent dearth of such skilled staff even in the years when it had much capital and plants with which to fulfil its core functions. It is correct to believe that, although the training was more practical, it was temporary and little. Likewise, since the race categories of individuals trained in the departments is not stated in the colonial reports and correspondences, we can infer from the PWD personnel roster that the main beneficiaries were Europeans. There was also the provision of a loose kind of technical training at the former airport at Mgulani in Dar es Salaam. This training began after WWII. It offered technical training at trade level to “mechanics, carpenters, masons, bricklayers, tinsmiths, sign writers, interior decorators, plumbers, welders, tailors and shoemakers”.<sup>45</sup> And by 1949 there were aspirations to provide training to electricians. Between 1946 and 1950 there were 2009 trade students in the territory, as enrolment records show.

The training provided at Mgulani and in the government departments was intended to address the shortage of basic trade skills in everyday life and deal with operational and maintenance issues. The duration of training was short and the training concentrated on immediate practical skills. The demand for skilled and semi-skilled labour force in the government exceeded supply.

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<sup>43</sup> United Kingdom, *Report to the General Assembly of the United Nations on the Administration of Tanganyika for the Year 1949* (London: His Majesty's Stationery Office, 1950), 128.

<sup>44</sup> *Idem*, *Report to the General Assembly of the United Nations on the Administration of Tanganyika for the Year 1952* (London: His Majesty's Stationery Office, 1953), 114.

<sup>45</sup> *Ibid.*, 127.

Hence, those who were trained in the basic trades important in everyday street life ended up being government employees, instead of being self-employed. The government, whose thirst for technical experts was overwhelming, was forced to employ even those who had not received any training in technical skills as long as they were “able-bodied persons in the territory.”<sup>46</sup> This form of training was not backed by any state policy or law.

Furthermore, the Ten-Year Development and Welfare Plan, developed by the government of Tanganyika under directives from London in 1946 and endorsed by the Secretary of State for Colonies in January 1947,<sup>47</sup> did not incorporate technical education in the larger education plan for 1946-1956. The plan accentuated increased provision of primary school education as well as student enrolment on middle schools, secondary schools and teacher training colleges. The plan predicated that the majority of African children would attain primary school education and a few middle and secondary school education. This explains why the first university entrants, hardly 40 throughout Tanganyika in 1950, according to Iliffe’s statistics, started emerging in 1949. Notwithstanding all the efforts made, the provision of education was one of the avenues in which racial disparities and divisions were deliberately created and implemented. To put it bluntly, the colonial education provided in Tanganyika had all elements of apartheid. The educational policies encouraged the establishment of separate schools for separate races under the ruse of conserving “their respective cultures”.<sup>48</sup> There were separate schools for Europeans, Asians and Africans in Tanganyika. Moreover, the quality of education was also determined by one’s race. The best schools in terms of curriculum, learning infrastructure and teachers were for European kids. The second-best schools were for Asian children. African children attended schools at the bottom of the quality pyramid. In the government expenditure plan for 1955-1960, for instance, European and Asian (non-native) education was allocated £1,500,000, whereas native education was allocated £1,000,000<sup>49</sup> in a country where people of Asian and European descent constituted less than 50,000 and 25,000 of the population of 8 million people.

Equally important, the racial categories were indicators of economic classes. Consequently, whereas European and Asian children attended the best schools within Tanganyika or abroad and later joined universities abroad, African children attended the schools at the bottom of the educational pyramid and had no possibility of getting university education. The first university was

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<sup>46</sup> *Ibid.*, 128.

<sup>47</sup> See the letter from the Secretary of State for Colonies to Tanganyika in BNA, CO691/198/8: Development in Tanganyika – Ten Year Development Plan. The proposals for this plan were prepared in 1944 as per the document attached in this file.

<sup>48</sup> BNA, CO691/198/12: Education in Tanganyika – Non-Native Education.

<sup>49</sup> See the Tanganyika Development Plan 1955-1960 in BNA, CO822/1025: Tanganyika Development Plans 1955-1960 – Township Development.

established in Tanganyika immediately before independence. In the East African region, the first university college was Makerere College in Uganda that became the college of the University of London in 1949. A few Tanganyikans attended as government scholarship grantees. However, as historian John Iliffe observes, the education system of Tanganyika made its students to have “entrance standards outpaced” at Makerere.<sup>50</sup> The consequence was that Tanganyika had the smallest number of university students in the region. The emphasis of the government scholarships in Tanganyika was on education, culture and, to some extent, medicine. No wonder, therefore, that the first presidents of Tanganyika, Kenya and Uganda were teachers and cultural anthropologists, respectively. In Tanganyika, the earliest university and technical education graduates of African descent were paid lower than those belonging to other racial categories even when they did the same job. In the British government report to the United Nations of 1960, it was reported that such practices ended in 1954 when the colonial government introduced the “equal pay for equal work” principle.<sup>51</sup> The significance of this principle in Tanganyika is imperceptible as most of the colonial native workers were unskilled and only a few were semi-skilled. The native skilled workers formed less than 1% of the colonial work force. This means that the principle was elitist or classist in nature. Moreover, in the British Empire, the principle was implemented earlier in the colonies than in Britain itself. In Britain, women, immigrants, children and British citizens of Asian and Afro-Caribbean origin were paid less than male and white employees for doing similar jobs. It was not until the passage of the Equal Pay Act of 1970 that the equal pay principle began to be implemented in Britain, reluctantly.<sup>52</sup> This underlines the fact that engineering cultures and urban governance practices and related labour and industrial relations were being circulated from the metropolitan to colonial cities.

The provision of scholarships, however, was never altruistic, contrary to what has been shown in Iliffe’s magnum opus on Tanganyika.<sup>53</sup> First, it came as a result of pressure from the United Nations envoy visits to Tanganyika in 1948 and 1949. Tanganyika was a trusteeship colony of the United Nations. Hence, the British were well aware of the post-war educational requirements for the trusteeship colony.<sup>54</sup> It also came as a result of the British fear of racial turmoil that might have been caused by socio-political segregation.<sup>55</sup> The British understood that their long-held principle of providing separate and unequal education was untenable. A report on the state of non-

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<sup>50</sup> John Iliffe, *A Modern History of Tanganyika* (Cambridge: Cambridge University Press, 1979), 445.

<sup>51</sup> United Kingdom, *Report to the General Assembly of the United Nations on the Administration of Tanganyika for the Year 1960* (London: Her Majesty’s Stationery Office, 1961), 30.

<sup>52</sup> Selina Todd, *The People: The Rise and Fall of the Working Class* (London: John Murray, 2015), 311-313.

<sup>53</sup> Iliffe, *A Modern History*, 437-8.

<sup>54</sup> See a letter from A. Creech-Jones to the Governor of Tanganyika dated 29.01.1947 in BNA, CO691/198/8: Development in Tanganyika – Ten Year Development Plan.

<sup>55</sup> BNA, CO691/198/12: Education in Tanganyika – Non-Native Education.

native education underscored the danger of continuing to provide that kind of education. It noted that:

East Africa is faced by the extremely intractable problem of building up an organic community of three groups with very widely differing cultures, Africans, Asians and Europeans. To ignore these differences by aiming at uniform system of education and schooling would only not be impracticable but would infringe the natural right of the communities to conserve their respective cultures. On the other hand, it would in the long run be politically and socially disastrous simply to acquiesce in, and possibly to deepen, the existing differences. Steps should be taken, and the sooner the better, to establish closer relations between the several parties in the educational field.<sup>56</sup>

As a result, in 1949 the British began reforming the educational policy and the way of providing education in Tanganyika. Among the reforms made was the plan to provide integrated education, with a view to ending the cultural differences. Despite the improvement made, the normal primary and secondary education remained separate and unequal in practice throughout the remaining 12 years of colonialism. This was consolidated by the establishment of a Non-native Education Authority on 1<sup>st</sup> January 1949.<sup>57</sup> On the other hand, the provision of technical education saw a non-racial and equal policy being implemented. Thus, neither the trade schools nor the technical institute had separate branches or amenities or standards in its curriculum.

As part of the educational reforms and of formalising the provision of technical education in Tanganyika, the UK government informed the United Nations in 1948 that it would merge the Mgulani centre and departmental training units with the East African Railways and Harbours Administration training centre in Tabora – the Western Province of Tanganyika.<sup>58</sup> The objective was to set up a formal, bigger, permanent and broad technical institution in Tanganyika that would meet all technical demands. This was to go hand in hand with the establishment of a section of technical education in the Department of Education which would be headed by an autonomous superintendent. A year later, however, neither the merger of technical centres nor the appointment of superintendent of technical education had materialised. The 1949 United Kingdom report to the UN explained the failure in the following terms:

It was anticipated that the move would take place during 1949, but unforeseen circumstances made it impracticable. As a result of drought conditions, there has been an acute shortage of water at Tabora throughout the year. This and other factors have led to reconsideration of the proposals for future technical training facilities and plans are now being prepared a merger of the Mgulani centre with that of the Overseas Food Corporation at Ifunda, the joint centre to be under Government control.<sup>59</sup>

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

<sup>57</sup> See extract of a letter from Mr. J.P. Attenborough to Mr. Cox dated 26.12.1948 in BNA, CO691/198/12: Education in Tanganyika – Non-Native Education.

<sup>58</sup> United Kingdom, *Report to the General Assembly of the United Nations on the Administration of Tanganyika for the Year 1948* (London: His Majesty's Stationery Office, 1949).

<sup>59</sup> *Idem.*, *Report to the General Assembly of the United Nations on the Administration of Tanganyika for the Year 1949* (London: His Majesty's Stationery Office, 1950), 128.

The two schools to be established were Ifunda and Moshi technical schools in southwest and northeast Tanzania, respectively. The only college was a technical college in Dar es Salaam. The college was to train the middle-level technicians. As stated in Chapter IV, before the 1950s the government technical institutions like the PWD did not take serious considerations in recruiting semi-skilled and skilled African manpower. Hence, the pedagogical part of technology was functional in that it sought not only to produce on-site technology receivers and tinkerers but also reduce the labour shortage that government institutions were facing. It was the beginning of breaking the myth that Africans were not technologically adept. However, the move was superficial owing to the establishment of three technical institutions, which enrolled less than 400 students per annum in a country with a population of more than 8 million people.<sup>60</sup>

The British emblem in technical education in Tanganyika was the Technical Institute Dar es Salaam. Opened in October 1957, its opening was a symbolic show of British altruism and technological paternalism. It was opened by the Colonial Secretary, Mr Alan Lennox-Boyd. Lennox-Boyd travel of thousands of miles for this event was a statement to the growing decolonisation movement under the Tanganyika African National Union (TANU) that Britain was not exploiting the colony and its people, but rather it was ‘developing’ them. The development narrative, as has been shown in other chapters, was a post-WWII French and British propaganda aimed at containing colonial resistance. In the *Tanganyika Standard*, the headline about the opening of the Technical Institute was “BRITAIN IS ANXIOUS TO HELP,”<sup>61</sup> which was bolded, capitalised and with enlarged font. As the headline read, it was clearly grooming the development narrative not only to the elites of TANU and the government employees who could read English newspapers but also the Asian and European communities within Tanganyika.

From 1957 to 1960, the average annual enrolment for fulltime courses was 112 students. The specific purpose of establishing the Technical Institute, according to the then Tanganyika’s Minister for Social Services, Mr J P Attenborough, was to ensure “sound standards of craftsmanship and of technical skill and knowledge.”<sup>62</sup> The underlying objective was to impart practical skills and knowledge to Tanganyikans who would serve in the government departments afterwards. At the institute, the practical skills imparted to students were the clerical and junior engineering assistantships. Looking at the description of courses offered, one is tempted to believe that the engineering profession gained a huge boost as a significant number of junior engineers

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<sup>60</sup> URT, *1968 National Capital Master Plan Dar es Salaam: Technical Supplement No. 4 – Economic Valuation* (Toronto: Project Planning Associates Ltd, 1968), 9.

<sup>61</sup> *Tanganyika Standard*, 22.10.1957.

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

were to be produced. On the contrary, over 95 per cent of the students undertook clerical courses, instead of junior engineering courses. In 1959, a telegram from the Governor of Tanganyika to the Secretary of State for Colonies in London reported that of the 112 fulltime students at the institute, 104 were doing clerical courses and only eight were doing junior engineering assistant course.<sup>63</sup> Archival records do not show the type of engineering specialisations which those students undertook in the late colonial period. Thus, it is difficult to understand the impact of this training on the engineering sections of the PWD, particularly in the recruitment of local outputs.

The desire to provide formal technical education in Tanganyika appeared in the colonial circles in 1949 and 1950. The institutional set-up and budgetary allocations for providing technical education were made in 1952.<sup>64</sup> With limited funds, the establishment of Ifunda Trade School and the Technical Institute at Dar es Salaam materialised in 1954 and 1957, respectively. The major force behind this course of action was the increased demand for skilled manpower for doing small- and large-scale technical works following unprecedented pouring of capital from London. It was actually the construction capital that was a grant disbursed under the *Colonial Development and Welfare Act* of 1940 which, in the 1950s, was reported to have reached “a peak unattained before”.<sup>65</sup> Examining the technical education centres that were established in the 1950s, one realises that the British established these institutes for all Tanganyikans, regardless of their racial differences. In other words, technical education seemed to go against the colonial educational policy that concentrated on offering education along racial lines. The contradiction between their demand and their supply through technical education is that they wanted more experts for large technical systems, while they were producing manpower who could apply small-scale technologies. Large technical systems include drainage, roads, water provision, electricity and telecommunication systems. Small-scale technologies like carpentry, masonry, mechanics and electrical repair were, thus, the main product of the technical education provided in Tanganyika. The small-scale technological training produced technicians. More technicians were trained in the technical schools at Ifunda, Moshi and Mbulani than at the Technical Institute at Dar es Salaam.

University education depended on scholarships from abroad that were increasingly provided by the government, the USA and the United Nations. The fact that up to independence there was no local graduate in engineering sciences means that the scholarships were in the category of basic educational and cultural studies. The colonial authorities seemed to have realised the need to provide university education in Tanganyika towards the end of colonialism. The first

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<sup>63</sup> BNA, CO822/1605: Tanganyika: Dar es Salaam Technical College.

<sup>64</sup> BNA, CO822/1096: Colonial Development and Welfare Grant for Technical Education in Tanganyika.

<sup>65</sup> See in United Kingdom, *Report to the General Assembly of the United Nations on the Administration of Tanganyika for the Year 1952* (London: His Majesty's Stationery Office, 1953).

consideration surfaced on the higher decision-making levels in 1956, which prompted the formation of a special committee to examine and propose a possible policy and areas in which to establish a university college.<sup>66</sup> Surely, this late consideration is significant in understanding the history of the provision university education in Tanzania, which was first documented by Tanzanian historians in 2008.<sup>67</sup> This study reveals that the claim that the discussion over establishing a university started in the late 1960 is wrong. As in technical education, the colonial state began drawing attention on serious training of local planners when urban planning problems grew in the 1950s. In other words, demand of skilled Tanganyikans influenced the government to start considering investment in technical and higher education simultaneously.

### 6.3 The Post-colonial State and ‘Technicians’

On 4<sup>th</sup> March 1980, the *Daily News* reported about the annual dinner gala of the Institution of Engineers of Tanzania. Held in Dar es Salaam, the gala was attended by the Prime Minister of Tanzania, Edward Sokoine. Sokoine noted three issues. First, there was an impending danger of not implementing engineering projects timely and accordingly owing to a severe shortage of engineers. The second was encouragement to participants to emulate the Global North, particularly in “the success of the Industrial Revolution” which in his understanding “was very much assisted by apprenticeship schemes which were able to bring about sufficient numbers of skilled engineers.”<sup>68</sup> The rationale behind this call was to appropriate the circulated technologies so that they could fit the local Tanzanian context. By appropriation, Sokoine meant that engineers had to adapt their knowledge and practices to “Tanzania’s social and economic conditions.” He wanted the contemporary engineers to avoid being too theoretical as well as elitist – the social statuses of engineers that come with engineering technology from the Global North. It was because of this concern that the Prime Minister and the state newspaper compared engineers to technicians. In this case, Sokoine offered an instance of Chinese engineers who built the TAZARA railway and the Kidatu hydro-electric dam although they lacked basic urban amenities such as a proper water supply, housing, electricity and macadamized traffic infrastructure. The third issue was about the professional fetters introduced by the Institution of Engineers against the young engineers. Sokoine “warned over the unbecoming tendency among professional bodies to keep the membership of their respective ‘clubs’ as small as possible to enhance the value of their professions.”<sup>69</sup> This means

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<sup>66</sup> United Kingdom, *Report to the General Assembly of the United Nations on the Administration of Tanganyika for the Year 1956* (London: Her Majesty’s Stationery Office, 1957), 72.

<sup>67</sup> Isaria N. Kimambo, Bertram B.B. Mapunda & Yusufu Q. Lawi eds., *In Search of Relevance: A History of the University of Dar es Salaam* (Dar es Salaam: DUP, 2008).

<sup>68</sup> *Daily News*, 4 March, 1980.

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



that one of the reasons for the country having a few engineers was the fetters of the Institution of Engineers that certified young engineers so that they could practise their trade. Sokoine and the reporter did not describe further how the fetters contributed to the shortage of engineers in the country. They only stated that such fetters were common in many professions, citing examples from law, medical, accountancy and architectural bodies.

The Prime Minister's concern came 19 years after independence. At the time, there was a single higher learning institution that offered engineering education at degree level. That was the University of Dar es Salaam, a national university in the de facto capital of Tanzania – Dar es Salaam. Although the University began as a University College in 1961, it started offering an undergraduate engineering programme and set up the Faculty of Engineering in 1973.<sup>70</sup> Hence, when the Prime Minister noted the shortage of engineers, it was just six years after the formal training of engineers had begun. It is also important to note that, up to 1980, Tanzania had not begun training architects and urban planners within the country. It was, therefore, no accident that the 1968 and 1979 Dar es Salaam master plans were developed by Swedish and Canadian experts. An urban geographer, Allen Armstrong, alluded in his article that the 1979 Dar es Salaam Master Plan had inputs from the locals.<sup>71</sup> But the locals he referred to were the political decision-makers such as the city councillors and the central government leaders. The local input did not come from the local urban planners. This means that all three master plans for Dar es Salaam and their resultant urban materiality were a foreign product in every sense. It also reveals that the goal of reducing the dearth of skilled technical experts by 1981, formulated in the First and Second Five-Year Development Plans, was not achieved.

The fact that the *Daily News* was labelling, or rather calling, engineers and all other technical professionals like architects and urban planners 'technicians' can thus be interpreted as reflecting a shortage of high-level engineers. It represents an understanding that the society was still used to receiving technicians from trade schools and the technical college, but not from higher learning institutions as well. Furthermore, the labelling portrayed a continuity of colonial training, which had emphasised the training of technicians rather than full professionals. There was no difference between technicians on the one hand, and engineers and urban planners on the other. Labelling was not the only indicator of the shortage of engineers. The persistent industrial under-capacity production, which was reported in annual economic status reports of the government of Tanzania between 1970 and 1990, was another indicator. In 1972, the only cement factory in Tanzania

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<sup>70</sup> Isaria N. Kimambo "Establishment of Teaching Programmes" in Kimambo et al. eds., *In Search of Relevance* (Dar es Salaam: DUP, 2008), 107-132.

<sup>71</sup> Allen Armstrong, "Colonial and Neocolonial Urban Planning: Three Generations of Master Plans for Dar es Salaam, Tanzania", *Utajiti* 8, no. 1 (1986), 43-66.

located at Wazo Hill literally halted production for a month because its only engineer was a foreigner and had gone on leave. Incidents of this nature caused conspiratorial debates about the few engineers ultimately obfuscating the inherent problem – the shortage of engineers.<sup>72</sup>

The call for more engineers during the dinner gala and associating a large number of technical experts as a critical factor for industrial revolutions in the Global North reveals that the Tanzanian state had adopted what a historian of science and technology, David Edgerton, calls the ‘technocratic’ dimension of technology. As per the technocratic dimension of technology, the socio-economic development of a country is largely dependent on a large number of “science and technical” professionals in the government, business and social circles. The smaller the number of trained experts in those circles, the fewer the country’s chances of achieving technological and economic development.<sup>73</sup> This dimension was explicitly stated in the Three-Year and the first two Five-Year Development Plans of Tanzania.<sup>74</sup> In the Three-Year Development Plan of the 1961/1962 to 1963/1964 financial years, the goal was to expand the provision of technical education in the country. However, the objective to make this expansion was not training university-level professionals but increasing the number of trainees at the Technical Institute at Dar es Salaam and in the two trade schools in Moshi and Iringa.<sup>75</sup> At the time of developing the plan, the country’s population was about 12 million people. In the first two years of the plan, the government did not implement the plan effectively. In the first Five-Year Development Plan, the enrolment in all the technical education centres in the country was raised from 1964/1965 to 1968/1969.<sup>76</sup> The students enrolled did not exceed a thousand because the general student enrolment in secondary schools in the country stood at 5,250 students in that year. The plan showed government optimism in the rise of student enrolment in the technical schools and at the Technical Institute. Student enrolment at the Technical Institute was dependent on the rise of student enrolment in secondary schools, which produced its entrants. The state also welcomed voluntary agencies and donor countries to support the provision of technical education through “grants-in-aid”. The reason for applying this two-pronged approach to raising student enrolment in the technical schools and the college was the recognition of “clear benefits to the development of industry in Tanganyika.”<sup>77</sup>

In the first decade of independence, Tanzania was desperate for technical aid in order to implement its programme of Africanising the civil service. It welcomed aid from any country as

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<sup>72</sup> Emily Brownell, *Gone to Ground* (Pittsburgh: University of Pittsburgh Press, 2020), 76-7.

<sup>73</sup> David Edgerton, *Science, Technology and the British Industrial ‘Decline’ 1870-1970* (Cambridge: CUP, 1997), 6-7.

<sup>74</sup> See, for instance, in URT, *First Five-Year Development Plan*.

<sup>75</sup> Tanganyika Territory, *Development Plan for Tanganyika 1961/62 – 1963/64* (Dar es Salaam: Government Printer, 1961), 80-84.

<sup>76</sup> URT, *First Five-Year Development Plan*.

<sup>77</sup> URT, *First Five-Year Development Plan*, 71.

long as it is useful in any area of technical expertise. No measures were taken to select types of training and technology, which could have led to the formation of a national technological culture. The country was creating a situation close to chaos in technological circulation. In 1963, Mr J R Moore, a principal of Bradford Technical College in the United Kingdom, following his visit to the Technical Institute at Dar es Salaam observed in his report how aid affected the quality and future of technical education. Moore's report identified a critical shortage of teaching staff and teaching materials, the country's poverty and the call for Africanising the teaching staff and the civil service as factors for providing poor quality education. On lack of uniformity in the technical education curriculum, the report showed that "most of the leading Tanganyika educationists would prefer British methods and British staff but it is a poor country and they are aiming to get whatever they can for free."<sup>78</sup> The hierarchy of Bradford Technical College was keen to offer advice and teaching materials for the "establishment of a technical teacher training course" at the Technical Institute Dar es Salaam.<sup>79</sup> Bradford's efforts were partly a form of technical aid to a college they considered a sister college. The hidden agenda, however, was to influence the institute to adopt British technical knowledge and practices. They intended to pave the way for British technological circulation to happen as well as thwarting American swift penetration in technical training in Tanzania, which had begun at the Old Moshi Secondary School, an old British trade school in northern Tanzania. The American penetration had been funded by several foundations and aid agencies since the late colonial period. The leading foundation was the Ford Foundation.<sup>80</sup>

In the report, Bradford was not happy with the appointment of American heads of departments at the Technical Institute at Dar es Salaam.<sup>81</sup> The young independent country was becoming a fertile ground for the rivalry of foreign national technological cultures. The competition was affecting the country in different ways. For instance, the Bradford College senior administrators warned against the establishment of the engineering faculty at the University of Dar es Salaam. It was pointed out that the establishment of the faculty posed "dangers of rendering useless the Dar es Salaam Technical College."<sup>82</sup> This probably explains why engineering and spatial planning courses were established rather late compared to almost all the other university courses. Another consequence of technological is that it made most local decision-makers and trainers in technical education to constantly adopt foreign technical policies without adapting them to the

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<sup>78</sup> Memo by V.H. Moulton dated 09.12.1963 in BNA, BW91/156: Bradford Technical College: Link with Dar es Salaam Technical College.

<sup>79</sup> Letter from H.M. Collins to J.R. Moore dated 09.04.1968 in *Ibid.*

<sup>80</sup> BNA, CO822/2642: Dar es Salaam Technical College – Tanganyika.

<sup>81</sup> Report on Dar es Salaam Visit in BNA, BW91/156: Bradford Technical College.

<sup>82</sup> *Ibid.*, 13.

local needs and conditions. This meant that technical education standards were for a long time following foreign standards. The historian Isaria Kimambo noted a similar situation in all three universities in the three East African countries in the 1960s. He considers foreign standards to be a manifestation of a colonial mentality that affected the psychology of local educators and decision-makers.<sup>83</sup> While all disciplines were appropriating foreign learning traditions at the University of Dar es Salaam to meet the national demands in the early 1970s, “most of the members of the academic staff in the Faculty of Science” were perceived as “conservative” for showing little enthusiasm about the appropriation the traditions.<sup>84</sup>

In the first decade of independence, the Technical Institute at Dar es Salaam diversified its courses. While there were only two courses in the late colonial period, by 1966 the Institute was offering more than six courses, which had been put into three general clusters. The clusters were technician, craft and commercial clusters. In the technician category there were mechanical, civil and electrical courses. In the craft category there were engineering and construction courses. In the commercial category, there were typing and stenographic courses. In all the courses, the highest award a graduate received was a diploma. Since junior engineering assistants also received the same awards, it could be argued that the tendency of the state and its media of labelling engineers as technicians was not an accident. Rather, it was derived from the formal technical education training provided in the country for two decades before the establishment of university-level engineering training.

During the launch of the Second Five-Year Plan, the President of Tanzania, Julius Nyerere, reiterated the country’s goal to “achieve full self-sufficiency in trained manpower requirement by 1980.”<sup>85</sup> Cognisant of the poor and backward state of education in the country, Nyerere amplified the need to make drastic transformations so that the number of secondary, technical college and university graduates could rise. Unless measures to change the educational curriculum were taken, Nyerere warned, “we shall remain backward and dependent upon others until we are able to produce our own people with scientific skills.”<sup>86</sup> Nyerere’s warning came after he had uncovered that many secondary school students were failing science subjects in the national examinations in successive years. Science subjects were extremely important in producing quality technical college entrants. The failure was huge in Mathematics, Physics, Biology and Chemistry. Since the Faculty of Science at the University College Dar es Salaam was established in 1965,<sup>87</sup> it is possible that the

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<sup>83</sup> Kimambo, “Establishment of Teaching Programmes”, 108.

<sup>84</sup> *Ibid.*, 127.

<sup>85</sup> URT, *Second Five-Year Plan for Economic and Social Development, 1st July, 1969-30th June, 1974*. Vol. I (Dar es Salaam: Government Printer, 1969), 21.

<sup>86</sup> URT, *Second Five-Year Plan*, Xiii.

<sup>87</sup> BNA, BW90/138: East Africa: University of Dar es Salaam, Establishment of a Faculty of Science, 1962-1964.

failure was massive because of the lack of science teachers with university degrees (whose training also took a long time – four years). Nyerere’s view featured a year later when a monography on African technical education was published by John S McNown. McNown noted that among the Global North instructors in African and European technical institutions there was a myth which regarded Africans as being unable to “confront logical rigours on which the careers in physical science, mathematics and engineering depend.” Unlike Nyerere’s bureaucratic scorn, which did not explain the massive failure in science subjects, McNown anchored the failure on historical and situational factors. To him, the failure was rooted in the colonial systems which had been inherited and which discouraged the teaching of science subjects to Africans.<sup>88</sup> Understanding the need to address Nyerere’s concern, the plan emphasised employing foreign teachers – most of them coming to the country through volunteer and grant-in-aid programmes – “increasingly in the technical science.”<sup>89</sup> Thus, between 1961 and 1970, the country relied on many expatriate graduates to teach science subjects at both school and university levels. Since the expatriates were teaching on a short-term basis and were few, they would not have produced a miracle by training many Tanzanians within a short time.

The Second Five-Year Plan of 1969-1974 also had statements on expanding the Technical College and establishing the Faculty of Engineering at the University of Dar es Salaam.<sup>90</sup> Engineering was not the only discipline whose training was not being offered at university level in Tanzania by 1968. Others were agriculture and medicine.<sup>91</sup> The general picture of science and technology in the country was still gloomy. Furthermore, the implementation of the plan was slow. There were no notable changes in curriculum at the Technical College, apart from the increase in student enrolment. The plan did not explain how the temporary and structural problems at the College would be addressed. On structural problems, for instance, the plan did not offer any details as to how the state would deal with the American and British technical education differences. A similar scenario faced business education, which was established, offered and funded by West Germany under Herr E A Heger.<sup>92</sup> In the early 1970s, West Germany withdrew all its technical support to Tanzania. The withdrawal was caused by Tanzania’s foreign policy, which recognised East Germany. Therefore, it was either the Scandinavian or socialist countries that could cheap in and fill the void. In the overall assessment of Tanzania’s position, it seems that the state was

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<sup>88</sup> John S. McNown, *Technical Education in Africa* (Nairobi: East African Publishing House, 1970), 4-5.

<sup>89</sup> URT, *Second Five-Year Plan*, 22.

<sup>90</sup> URT, *Second Five-Year Plan*, 66.

<sup>91</sup> *Ibid.*, 156.

<sup>92</sup> See page 13 of the report in BNA, BW91/156: Bradford Technical College: Link with Dar es Salaam Technical College.

unaware of or unconcerned about the foreign cultural differences in technical education. There was an explicit lack of proper and unitary guidelines of technical education thus inhibiting local appropriation processes. The plan did not explain how the government would address the shortage of staff and the lack of up-to-date books. These problems were noted in the report that Bradford wrote.<sup>93</sup>

Discussions on founding the Faculty of Engineering at the University of Dar es Salaam began in 1972. A year later, the faculty began teaching after adopting a curriculum comprising theoretical and practical training. With respect to practical training, students were to undergo practical training at the faculty (which was under construction) and in the industries in Dar es Salaam and elsewhere.<sup>94</sup> Like the Faculty of Science, the Faculty of Engineering relied heavily on expatriates on the senior levels, with Tanzanians occupying the junior levels. Tanzanians occupied junior teaching positions as most of them were still being trained. Evidence shows that, by 1970, two-thirds of the academic staff were foreigners.<sup>95</sup> This situation was changing gradually in the 1970s and 1980s. By the late 1980s, most of the university departments had recruited more than two-thirds of national academic staff. In comparative terms, however, the Faculty of Engineering had the slowest pace in replacing foreign staff with locals because it was established late and because of the long duration of training engineering academic staff.

We pointed out earlier that the Faculty of Science at the University of Dar es Salaam was perceived as being resistant to change. The main reason for the conservatism offered by conventional historians is the inability of the faculty to adapt to the university-wide knowledge appropriation wave. This is no different to saying that had the technology (engineering) and sciences been innovative, they would have produced technologists and scientists who would have thrived well in the Tanzanian and African contexts. Conservatism was not limited to Tanzania. It was a common phenomenon across the African continent. The other problem is that, even in the countries where engineering training at university-level began early, most of the huge engineering projects were executed by foreign engineers. Our observation of Africa as a whole show that foreign monopoly on engineering projects persists in the second decade of the twenty-first century. Out of 54 countries, it is only a handful of countries like Ethiopia, Egypt, Morocco and South Africa, where national engineers are present and vibrant in various projects. In other countries, local engineers undertake peripheral and small projects. McNown notes that most African technical institutions produced engineers for implementing maintenance and minor

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<sup>93</sup> *Ibid.*

<sup>94</sup> URT, *Second Five-Year Plan*.

<sup>95</sup> BNA, BW90/1364: University of Dar es Salaam: BESS Policy.

projects. They could not design novel projects, nor manage huge projects because of the inherent weaknesses of their training. McNown wants us to consider the influence of the African intellectual political economy.<sup>96</sup> In the Global North and China, this is called the social status of engineers in society.<sup>97</sup> In all cases, engineers were among the elites or lower-level actors in their countries, depending on the political orientation of their countries before and during the Cold War. In African countries, the few national engineers were invariably involved more in political administration and social engineering than in addressing the problems normally plaguing their professions. During the construction of the Tanzania-Zambia road and railway as well as the national electricity grids between the 1960s and 2000, for instance, it was foreign nationals who built them.<sup>98</sup> In Chapter IV, we also saw that the City Council of Dar es Salaam was heavily reliant on foreign volunteer engineers from Global North countries. Whereas this reliance ended in the 1990s, the monopoly of major engineering projects by foreign nationals and the use of national engineers has not ended yet. In 2015, for instance, the fifth president of the United Republic of Tanzania appointed prominent local engineers to political administrative posts; they made roughly 40% of the presidential appointees.

The national engineers in Tanzania are many now unlike in the past four decades. In a conversation with the current Director for Dar es Salaam Rapid Transit (DART) on the persistent monopoly by foreign engineers of huge projects, including the DART project, Eng Ronald Lwakatare noted that there were many factors for that. For instance, he said that most of the huge projects come in the form of loan or aid. Such loans and aid are accompanied by conditionalities that require the involvement of engineering companies from the donor countries in the implementation of the relevant projects. The foreign companies come with their engineers, hence limiting the role of local engineers in the projects. Another factor is that the foreign engineers have companies that have capital enough to purchase the necessary machinery and to sustain the labour force even during payment delays.<sup>99</sup> Eng Lwakatare's observations are valid. They help to explain why national engineers are given maintenance contracts that do not need huge capital and machinery. Hence, apart from McNown's training weaknesses thesis, we need to consider other factors that cause African engineers to be confined to the periphery of the engineering world. It is not helpful analytically to adopt mono-causal factors. A very recent work by an MIT-based historian of science and technology, Clapperton Mavhunga, noted that the inefficiency of African

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<sup>96</sup> McNown, *Technical Education*, 8.

<sup>97</sup> Cf. Schueler, *Materialising Identity*, 38; Wang, "Development and Integration", 42.

<sup>98</sup> Cf. the American, Chinese and Italian engineers in the construction of roads, railway and power grids in the southwest highlands of Tanzania in the 1960s and 1970s in Jamie Monson, *Africa's Freedom Railway* (Indianapolis & Bloomington: Indian University Press, 2010).

<sup>99</sup> Personal communication with Eng. Ronald Lwakatare, Dar es Salaam, 30.09.2016.

scientists and technology innovators is exclusively associated with education. It renounced the narrative that the African science and technology (ST) was ‘backward’ and ‘almost absent’ on grounds that it failed to consider the interplay between education and ST. Like McNown, Mavhunga is of the opinion that training in ST in Africa involved adopted the Global North models without adapting them to the African conditions. While Mavhunga says that we have to use more the traditional African ST epistemologies which emphasise practice than the imported theoretically-oriented “Bench” ST,<sup>100</sup> McNown suggests that we look at the interplay of the historical factors relating to the whole education system, the teaching of ST and the motivation of actors (people and state) so that they promote and study ST. Thus, one learns that Mavhunga’s analysis is narrow and putative, despite its novelty, but McNown’s analysis is broad.

A fairer and nuanced analysis of African ST is one that considers the general education system, training in ST, the political economy of elitism and aid and the role of the state and professional bodies in creating sturdy engineering societies. The first three main factors have been elaborated in both primary and secondary sources in varying degrees. At this juncture, it is vital to elaborate the fourth factor so that a four-dimensional analysis for African ST can be done. At the beginning of this chapter, we cited the engineers’ dinner gala that was attended by PM Sokoine. The important issue here is that the few Tanzanian engineers had their own society, which was the guardian of the engineering profession in the country. Unlike in Britain, where there were many engineering societies, depending on one’s specialisation, for example the Institution of Civil Engineers (ICE) and the Institution of Mechanical Engineers (IME),<sup>101</sup> in Tanzania there was only the Institution of Engineers (IE). Figures showing the ratio of, say, the civil to mechanical and electrical engineers in the society are not available. Their availability would shed light on the significance of individual groups in the big engineering projects implemented in the country. From the PM’s comment, it is clear that the IE mainly focused on registering and licencing new engineers. The IE also acted as a trade union that fights for the bread-and-butter issues of engineers. It was elitist and exclusive society. It is unclear if they promoted the study of engineering in Tanzania.

Furthermore, it is not clear either how they lobbied for engineering projects in the government since the government was the main employer and project financier in the socialist era. It is still not clear if Tanzanian civil engineers cultivated a certain form of engineering culture or style as was the case in other parts of the world. In China, for instance, they followed the Soviet tradition up to the 1960s when they decided to develop an independent Chinese engineering

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<sup>100</sup> Clapperton Chakanetsa Mavhunga, *What Do Science, Technology, and Innovation Mean from Africa?* (Cambridge & London: The MIT Press, 2017).

<sup>101</sup> Casper Andersen, *British Engineers and Africa, 1875-1914* (London: Pickering & Chatto, 2011).



culture.<sup>102</sup> Various records show that, by 1980, Tanzanian engineers had been trained in different countries, socialist and capitalist, in the Global North and the Global South. In the late 1990s, the state founded the Engineers Registration Board (ERB), which replaced the semi-autonomous IE that had existed since the 1960s.<sup>103</sup> ERB assumed all the functions that the IE used to perform. It has put all engineering professions under one umbrella. Since unlike the IE, ERB is a statutory body, the state exerted its influence in the engineering profession, something that was also noted in Communist China.<sup>104</sup>

The Tanzanian state did not only exert its influence technology by offering university engineering training in the country, supporting the IE and forming ERB but also made many interventions. The earliest form of its involvement in the engineering profession was manifested in the early 1960s. This was a moment when the training of university-level engineers within the country was impossible. It was impossible because the only university in the country was still in its infancy and was facing many challenges, including the construction of buildings at its permanent site. Realising the absence of national engineers and local engineering companies, the state, through the ruling party, began taking measures in 1963 by purchasing shares in the private engineering firms. The party was using its economic development arm known as Mwananchi Development Corporation (MDC) in taking the measures. According to a former government economic advisor, Andrew Coulson, MDC bought a few shares in a company which was managed by an Asian family and which had been undertaking construction activities in Tanganyika since the 1920s.<sup>105</sup> In 1966, the state founded the National Development Corporation (NDC). Since Tanzania became a single-party state in 1965, MDC assets, including the shares in the construction firm, became state assets and were transferred to NDC. NDC purchased the remaining shares in the firm; thus, the company came to be called Mwananchi Engineering and Construction Company (MECCO).<sup>106</sup> Like technical posts in government departments, the purchase and formation of MECCO was a symbolic representation of the state's efforts to 'Africanise' all technical works and positions in the country.

It should also be noted with respect to MECCO that the state was beginning to nationalise the economy and the other sectors. The nationalisation of the key sectors of the economy became pronounced in 1967 when the state was declared an *Ujamaa* – African socialism – state. Much about *Ujamaa* has been discussed in many scholarly and journalistic works and, therefore, we will not

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<sup>102</sup> Wang, "Development and Integration", 49-56.

<sup>103</sup> [www.erb.go.tz](http://www.erb.go.tz), accessed on 13.09.2017.

<sup>104</sup> Cf. Chinese state emulation of the Soviet Union engineering in Wang, "Development and Integration", 134.

<sup>105</sup> Andrew Coulson, *Tanzania: A Political Economy*. 2<sup>nd</sup> Edition (Oxford: OUP, 2013), 343.

<sup>106</sup> Al Noor Kassum, *Africa's Wind of Change: Memoirs of an International Tanzanian* (London & New York: T.B. Taurus, 2007), 44; Wells, "Dar es Salaam", 144.

repeat the discussion here. In relation to engineering companies, however, it is worth pointing out that *Ujamaa* led to the demise of private engineering and the rise of state parastatals. A development economist, Jill Wells, observes that, up to the 1990s, there was no single private engineering company in Tanzania.<sup>107</sup> However, records and historical literature show that most engineering works were executed by foreign companies from the donor countries. There was also a local private engineering firm in the country – the United Engineering Company. This company and MECCO implemented civil engineering projects tendered by the City Council of Dar es Salaam in 1966.<sup>108</sup> In 1967, the state sold 40% of MECCO's shares to a Dutch firm, the Overseas Construction Company (OCC). The sale was made on the condition that OCC would provide management staff to MECCO, “train craftsmen and technicians” (engineers) at all engineering levels, and control the accounting and financial affairs of MECCO.<sup>109</sup> By 1972, the company had had serious losses, had no internally trained manpower and had a huge foreign managerial team from Netherlands, contrary to the agreement. The government did not dissolve the company nor break the contract. Instead, it demanded that OCC improve its performance. OCC joined international firms and started winning contracts in the name of MECCO and took the lion's share of MECCO's income.<sup>110</sup>

MECCO's story shows how successfully Tanzania undertook protracted measures to Africanise engineering manpower, firm ownership and local retention of the income generated from the construction sector. MECCO executed more projects in Dar es Salaam than in any other city in the country. The projects include the building of concrete shades in bus stops, the construction of sections of roads and office and residential housing, and the building of the magnificent Kariakoo market. It seems MECCO did not implement any drainage projects. Most of these projects were built in the 1970s when the country was performing moderately well economically. There are no records on any projects being built by MECCO in the 1980s, a decade when Tanzania was in grave economic crisis. MECCO hibernated and disappeared from the construction sector. The company rose again in the 2000s following its privatisation. Since its rebirth, the company has won many tenders for road, airport and building projects from the state.<sup>111</sup> Therefore, the state was the main player in the development of the construction industry in the country for over four decades. In all cases, neither the state nor the engineers' societies attempted to nurture certain engineering styles that could distinguish Tanzanian engineering professionals

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<sup>107</sup> Wells, “Dar es Salaam”.

<sup>108</sup> CZNA, 1/8/01: Box no.27: Dar es Salaam City Council General 1965-66.

<sup>109</sup> Coulson, *Tanzania*, 343.

<sup>110</sup> *Ibid.*, 344-6.

<sup>111</sup> [www.meccoltd.co.tz](http://www.meccoltd.co.tz) accessed on 28.06.2017

from other African or Global North engineering professionals, particularly in the construction of drainage and traffic infrastructure.

## **6.4 Training in Engineering and Planning at the National University**

### *6.4.1 Engineering Sciences*

In the 1960s, there were a number of calls from MPs, ministers and the president for the students in various academic institutions to become engineers. There was a certain consensus among them that without engineers the country could not achieve its development goals. But there was something more to the calls: they were made under the assumption that many Tanzanian students did not want to study engineering. On his visit to Mzumbe Secondary School, the Permanent Secretary in the Ministry of Communications, Power and Works, Chief Erasto A M Mang'anya said that “the reason why young men do not like to spend more years in studying engineering or other technical professions is because they want to get married quickly ..., their parents insist on their getting married so that they can see (sic) grandchildren before they die.”<sup>112</sup> Nonetheless, Tanzania did not have a university that provided training in engineering at the time. But it had a Technical College, where it could send a few students. It was also sending some students abroad to study engineering.

By 1970, Africa had more engineers than engineering technicians, writes John McNown. By 1975, the number of engineers had risen to 600.<sup>113</sup> The distribution of local engineers was not even across the 54 African countries. Some countries had more engineers than others. The leading countries were Nigeria, Ghana and Sudan. When Tanzania attained independence in 1961, there was no single local engineer. But as archival records indicate, there were some engineering technicians who had been trained at the Technical Institute, Dar es Salaam.<sup>114</sup> The engineering technicians produced by the Institute were few. For a country which had just attained political independence, which had many development challenges and which was planning to transform its economy from a peasant agrarian economy to an agro-industrial economy, it could have been inimical if it did not take any measures to reduce the technical manpower shortage. And it could have been far more inimical to it if it were to increase the training of technicians at the Institute who were only intermediaries in the vast engineering activities.

It was in the Five-Year Development Plans that Tanzania stated its educational short-term and long-term goals. It was also in the same plans that the country also stated its desire to expand and transform the industrial base. Reading the Five-Year Development Plans with respect to

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<sup>112</sup> *Sunday News*, 29.04.1962.

<sup>113</sup> McNown, *Technical Education*, 8.

<sup>114</sup> BNA, CO822/1605: Tanganyika: Dar es Salaam Technical College.

matters pertaining to science, technology and education, one notices that the state's drive was to train as many scientists and engineers so that the country could have a sound industrial sector by the 1980s. Put otherwise, Tanzanian state officials bought the neo-classical thought of industrial development. David Edgerton, a historian of technology, in his monograph on the fall of the British industrial power defines the neo-classical thought as the capacity of economies or companies to make decisions "rationally in the face of conditions given by existing markets."<sup>115</sup> The rational decisions in Tanzania were not influenced by market forces. Instead, the decision-makers wanted to influence markets. As such, when Tanzania was planning to improve its technical manpower, it considered the needs of the industrial economy, at least theoretically. Thus, the engineers who were trained at the University of Dar es Salaam and abroad were to be employed directly in the newly established industries. But how did the training in engineering at the university take off? Where did its alumni go? Did the training meet the state's expectations?

The plans to provide training in engineering at university level in Tanzania came late compared to other academic disciplines. And when compared to the industrial sector which it was destined to serve, the training came even much later than it should have. Whereas teaching in most of the academic disciplines at the sole university began in the early and mid-1960s,<sup>116</sup> the plans for teaching engineering and constructing the buildings of the Faculty of Engineering started in 1971, with the support of the then West Germany.<sup>117</sup> In the agreement between West Germany and Tanzania, West Germany agreed to support the establishment of a university-level engineering programme in Tanzania by providing technical aid. This involved planning for the engineering degree programme and constructing buildings for the faculty, supplying teaching manpower and materials, and developing the curriculum for the three departments of the Faculty of Engineering. The departments, which defined the earliest engineering output, were the Departments of Civil Engineering, Mechanical Engineering and Electrical Engineering. Other agreements included the provision of 12 engineering scholarships to Germany and 40 scholarships to African engineering institutions for Tanzanian students. Some of the scholarship grantees were required to teach engineering at University of Dar es Salaam upon completion of their studies. The whole project cost about 45 million Deutsch Marks and took three years, that is, from 1971 to 1974.<sup>118</sup>

Although the buildings were not completed until 1974, student enrolment and the teaching of engineering began in 1973. The official inauguration of the faculty and the programme took

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<sup>115</sup> Edgerton, *Science, Technology and the British*.

<sup>116</sup> Kimambo, "Establishment of Teaching Programmes".

<sup>117</sup> Federal Agency for Economic Cooperation, *Technical Cooperation with Tanzania in the Establishment of a Faculty of Engineering of the University of Dar es Salaam* (Frankfurt: Bundestelle für Entwicklungshilfe, 1971).

<sup>118</sup> *Ibid.*, 5.

place just after completion of the construction in 1974.<sup>119</sup> From the 1970s to late 1980s, more than two thirds of the faculty's teaching staff came from abroad, especially Germany, Switzerland, Ireland, Norway, Belgium and Netherlands. While the German personnel came under the 1971 agreement and produced the first Dean of the Faculty of Engineering, Professor Dr W Kreuser, who served from 1973 to 1976,<sup>120</sup> the other foreign lecturers came under bilateral agreements, UNESCO arrangements and through employment provided by the Tanzanian government. Through the gradual "Tanzanisation" of the teaching staff, foreign dependence started declining in the late 1980s and early 1990s. In 1990, for instance, there were only 12 foreign staff members out of 123 teaching and non-teaching staff members.<sup>121</sup> "Tanzanisation" involved retaining the best Tanzanian students at the university and sending them abroad for graduate studies. They had to be sent abroad because the faculty had a limited number of Masters of engineering programmes in the 1980s and a limited number of PhD programmes in the 1990s.<sup>122</sup>

The student enrolment at the beginning of the faculty was 150 students per annum. Given that the whole degree programme took four years, the faculty planned to have about 600 students from first to fourth year by 1976. According to the programme arrangements, the first year of studies was for "consolidation in mathematics and science" and proper engineering training began in the second year.<sup>123</sup> Although this can be interpreted as the "failure of African institutions to depart from conventional European practice," to historians of technical education like John McNown, the German consultants seem to have discerned the level of mathematics and science teaching in primary and secondary schools. This was probably in line with the high level of massive failures in the subjects, which prompted the president of Tanzania to challenge the nation to rectify the situation in 1969 when inaugurating the Second Five-Year Plan.<sup>124</sup> The Germans intended to make the training of engineers satisfy "Tanzania's need for practical orientated engineers."<sup>125</sup> In other words, they wanted to meet the country's aspirations to adapt training in engineering to the national context. However, as McNown noted in 1970 on African technical education and Peter von Mitschke-Collande learnt of Tanzania's technical education ten years later, the training in engineering in Tanzania emphasised theoretical aspects than practical aspects of the training, ultimately making engineering studies "very academic". The training became very academic because

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<sup>119</sup> Faculty of Engineering, *The Challenge to the Faculty of Engineering in Tanzania* (Dar es Salaam: University of Dar es Salaam, 1996), 3.

<sup>120</sup> *Ibid.*; Federal Agency, *Technical Cooperation with Tanzania*.

<sup>121</sup> Faculty of Engineering, *The Challenge to the Faculty*, 16.

<sup>122</sup> *Ibid.*, 17.

<sup>123</sup> *Ibid.*, 2.

<sup>124</sup> URT, *Second Five-Year Plan*.

<sup>125</sup> Faculty of Engineering, *Challenge to the Faculty*.

“practical training and professional experience” were “not generally appreciated as necessary parts of the curriculum.”<sup>126</sup>

Producing academic rather than practice-oriented engineers was not the goal when the German consultants held discussions with the Tanzanian government and the university hierarchy on engineering education. Rather, it was an unintended and circumstantial outcome because of several obvious reasons. The first dean and most of the senior figures in the faculty came from Germany and other continental European countries which were known for being so theoretical in engineering education. Their backgrounds played a significant role in circulating a similar engineering culture. They replicated what they knew and failed to adapt it to the local conditions and needs. The situation was further complicated by the fact that Tanzania had no local professors of engineering at the beginning of the faculty. It began having such professors in the 1980s. Even when a Tanzanian national was made a dean in 1976,<sup>127</sup> he was not experienced. He mainly became an administrative figure, thus leaving the circulated knowledge and teaching model intact. Secondly, the circulation of engineering education went unchecked because there were no comparable engineering institutions in the country at the time. Until 2006, the Faculty of Engineering of the University of Dar es Salaam was the only institution in Tanzania that offered engineering education. Thirdly, in a 1996 internal assessment report, the faculty identified two other reasons why knowledge delivery was more theoretical than practical. This was the frequent change of office holders, that is, deans, heads of department and other senior figures in the faculty. This frequent change of officer bearers was also common in the local and central government departments and ministries. The changes had certain implications for the sustainability of the plans of the faculty. There was also enormous reliance on funds from the central government. The report indicates that the reliance on government funds affected “the faculty’s intention to consolidate, let alone to develop (sic) a prosperous future”<sup>128</sup> because “THE HEART OF THE MATTER: MONEY” (sic).<sup>129</sup>

In the first output from the faculty in 1976, the number of graduates was approaching 150. All were Bachelor’s degree holders. The number started growing following the establishment of the Department of Chemical and Processing Engineering (CPE) in 1979, the first such department to be set up in Eastern and Central Africa.<sup>130</sup> The number of graduates grew to more than 250 in

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<sup>126</sup> Peter von Mitschke-Collande, *Transfer and Development of Technology: Industrialization and Engineering Education in Tanzania* (Hamburg: Institut für Afrika-Kunde, 1980), 146.

<sup>127</sup> Faculty of Engineering, *Challenge to the Faculty*, 3.

<sup>128</sup> Faculty of Engineering, *The Challenge to the Faculty*, 4-9.

<sup>129</sup> *Ibid.*, 32.

<sup>130</sup> *Ibid.*, 3.

1982, a year in which a Master's programme in engineering was established. In 1990, the annual number of graduates had reached 260, whereas in 1995 it was 325.<sup>131</sup> This gradual increase in the number of graduates implies that there was a parallel expansion of primary and secondary school pupil enrolment which produced students for university education. It also offers us the impression that the situation of the academic staff at the faculty was improving and consolidating, both quantitatively and qualitatively. Whereas from 1976 to 1995 the faculty produced 2335 engineers, of whom 135 were agricultural engineers, the number of civil engineers was about 930<sup>132</sup> – almost 45% of all engineers. It had been planned that the civil engineering output would surpass that of other engineering specialisations, since about 50% of all engineering students had been studying civil engineering since the inception of the faculty.<sup>133</sup> It is not clear why civil engineering had the lion's share of student enrolment and output. One could only guess that, historically, across the world, the civil engineering output has always been the largest. China, for instance, had a high percentage of civil engineering students by 1953. A decade later, the highest percentage of engineering students was recorded in mechanical engineering followed by chemical engineering.<sup>134</sup>

It is important to note that, as the economist von Mitschke-Collande also observes, Tanzania wanted a large number of civil engineers for sustaining the import substitution industries (ISI) it had set up and to expand the industrial base.<sup>135</sup> This goal was stated explicitly in the First, Second and Third Five-Year Development Plans. In the Third Five-Year Development Plan, it was stated that the main objective was to develop “metal-working and engineering industries” in order to “produce spare parts for local machines” and “complete machines”.<sup>136</sup> Although the plans only mentioned civil engineers, it is evident that the country also needed more mechanical, chemical, electrical and other kinds of engineers. The main Five-Year Development Plan produced the 1975-1995 long-term industrial plan, which was largely not implemented for such unforeseen reasons as the failure to identify specific types for the contemporary national needs. The key goal of the industrial plan was to have technical self-sufficiency, on both local and national levels. That the university was producing more civil engineers than other kinds of engineers is symptomatic of the absence or presence of poor communication between the educational and governing institutions.

Moreover, to meet the country's demand for engineers at a moment when the country had a total population of about 17.5 million people,<sup>137</sup> the faculty was supposed to produce not less

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<sup>131</sup> *Ibid.*, 16.

<sup>132</sup> *Ibid.*, 15-16.

<sup>133</sup> Federal Agency, *Technical Cooperation with Tanzania*, 2.

<sup>134</sup> Wang, “Development and Integration”, 66.

<sup>135</sup> Von Mitschke-Collande, *Transfer and Development of Technology*, 25-29.

<sup>136</sup> URT, *Third Five-Year Plan*, 45.

<sup>137</sup> Retrieved from <http://www.nbs.go.tz/nbs/takwimu/references/1967popcensus.pdf> on 12.08.2017

than 3500 engineers per year. This is because a report by the Faculty of Engineering indicates that, in order for any country to meet her technological and industrial needs, it must have a “critical mass” of engineers, a level only attained when a country produces not less than 20 engineers in every 100,000 people. The report goes on to show that, by 1995, Tanzania had “only one vacancy for every 150,000,” which could not form the necessary “critical mass”.<sup>138</sup> Attaining a “critical mass” of engineers would have not only been a success for Tanzania but also a perfect execution of the West and East technological models. For instance, USSR began producing her “critical mass” of engineers in 1925. By the 1950s, it was already self-sufficient.<sup>139</sup> China started emulating the Soviet model in the 1950s and, by 1959, she had more than 280,000 engineers.<sup>140</sup> Equally important, Germany, which was supporting engineering education in Tanzania, was revered in the West for producing many engineers.<sup>141</sup>

As explained in the previous sections of this chapter, between 1961 and 1992, the main employer of the engineers was the government as the country was pursuing *Ujamaa*. The private sector was destabilised for three decades. The government was not employing engineers in purely technological jobs. In the late 1970s, “there” was a “shift of engineering experts away from professional into administrative posts” in public administration.<sup>142</sup> Comparing the situation in the labour market with the situation in the training institution – the Faculty of Engineering – one discovers that, no matter how good they were, the government’s policies were affecting the development of the engineering profession in the country. Providing engineering education with the sole objective of feeding the manufacturing sector and yet ending up producing more civil engineers also provides room for scrutinising the policy on science and technology in post-colonial Tanzania. A modest explanation is that the policy was not consistent, not well-planned and articulated, and lacked unity between theory and practice. More questions could be asked. For instance, if the country produced more civil engineers, why did the drainage and traffic infrastructure in post-colonial Dar es Salaam ‘break down’ often?

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<sup>138</sup> Faculty of Engineering, *Challenge to the Faculty*, 82.

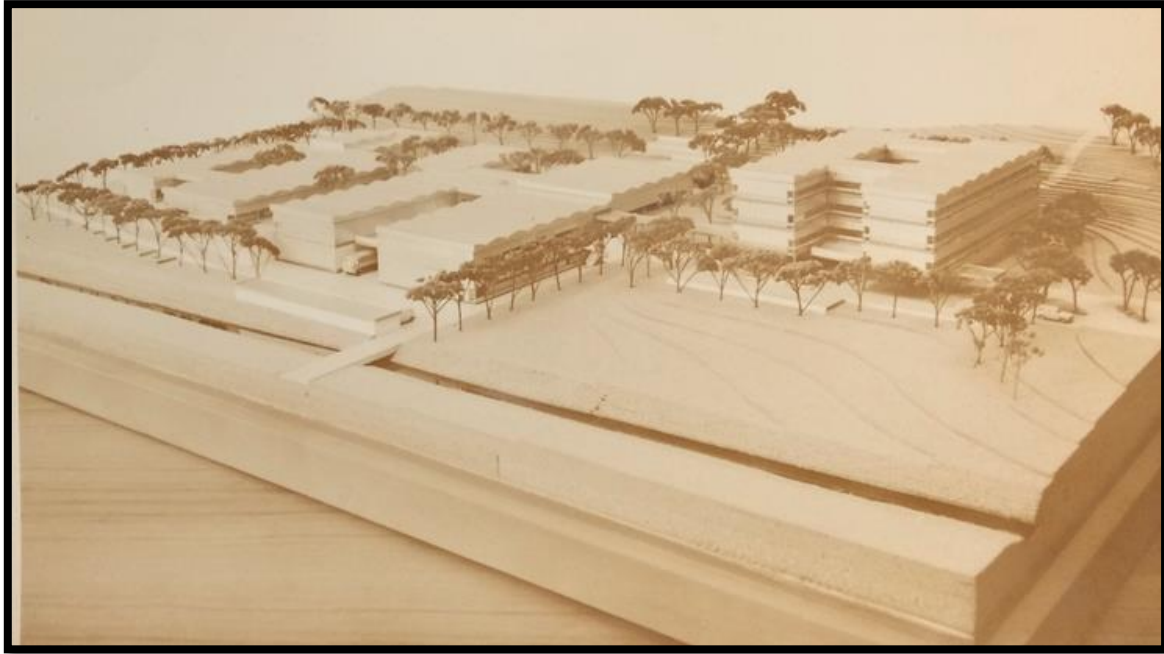
<sup>139</sup> Von Mitschke-Collande, *Transfer and Development of Technology*, 123.

<sup>140</sup> Wang, “Development and Integration”, 43-81, 148.

<sup>141</sup> Austen Albu, “British Attitudes to Engineering Education: A Historical Perspective” in Keith Pavitt ed., *Technical Innovation and British Economic Performance* (London and Basingstoke: Macmillan, 1984).

<sup>142</sup> Von Mitschke-Collande, *Transfer and Development of Technology*, 224.





**Figure 6.3:** Architectural Plan of the Faculty of Engineering Building  
*Source: Federal Agency for Economic Cooperation (1971)*

#### 6.4.2. Spatial Planning Sciences

In the previous sub-section, we mentioned that engineering sciences were introduced very late at the University of Dar es Salaam. spatial planning was introduced after three decades had passed since the founding of the university. Engineering and spatial planning share one dominant characteristic: both were established by foreign consultants at the same university and took a long time to be consolidated in their manpower resources and curriculum. As such, it took them a long time to produce independent and appropriated knowledge and practices. In the temporal perspective such forms of knowledge and practices were not developed because the institutions for training the experts were in their infancy.

Spatial planning, also referred to as physical planning in the literature to distinguish it from economic planning,<sup>143</sup> includes a range of disciplines, including geography, land use and management, architecture and urban planning. Some of these disciplines had already been introduced at the University of Dar es Salaam as full disciplines by 1960s. Geography, for instance, had offered as a full discipline since 1964. However, a sub-discipline related to spatial planning, that is, urban geography, took time to get a substantial number of researchers and publications. In the 1970s, urban geography was taught by an American geographer, Adolfo Mascarenhas. He had written a Master's degree thesis on urban Dar es Salaam in 1966,<sup>144</sup> which enabled him to be

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<sup>143</sup> Cf. Leander Schneider, *Government of Development: Peasants and Politicians in Postcolonial Tanzania* (Bloomington and Indianapolis: Indiana University Press, 2014), 112, 124-5.

<sup>144</sup> Adolfo Mascarenhas, "Urban Development in Dar es Salaam" (MA Thesis, University of California, 1966).

employed by the university. The situation started improving in the 1980s when a British, Allen Armstrong, and a Tanzanian, W F Banyikwa, joined the Department of Geography. Like Mascarenhas, they also published mainly on urban Dar es Salaam.<sup>145</sup> On the other hand, studies on land use, survey and management were being offered at the Ardhi Institute, but at a pre-university level as a two-year diploma programme. The institute was founded in 1974 as a public institution to replace the Survey Training School, which had been established by the British in 1956. The institute was located at the Observation Hill, an area close to the University of Dar es Salaam. It was transformed into a constituent College of Lands and Architectural Studies of the University of Dar es Salaam in 1996.<sup>146</sup> This was beginning of training local urban planners, architects, surveyors, land evaluators and environmental engineers at degree level. But how did this come about?

In the late 1970s, the University of Dar es Salaam started making plans to introduce architectural and spatial planning programmes. This was partly an attempt to make the university comprehensive and complete in knowledge delivery by diversifying its programmes. The university was also responding to the government's call to train local experts not only in spatial planning but also in building skills. In 1974, the Minister for Lands, Housing and Urban Development told Parliament that "it has become virtually impossible for local experts to participate (sic) and run all research activities in relation to building materials" so much so that most structural designs were using expensive foreign materials.<sup>147</sup> As was the case in most other technical universities in the world, the University of Dar es Salaam was appropriating the global tradition by achieving a complementarity between engineering and spatial planning studies when it sought to offer the two programmes. To implement the plan, the University requested the Republic of Ireland to undertake a feasibility study on a possibility of establishing a School of Architecture.<sup>148</sup> The Irish government responded by offering funds and experts through its Agency for Personal Service Overseas (APSO). Eventually, Irish experts teamed up with experts from the University of Dar es Salaam. The feasibility study started in November 1979 and ended in April 1983 when the report was submitted to the University of Dar es Salaam.<sup>149</sup> Unlike the report on the introduction of engineering programmes written by the German agency for technical cooperation, the Irish report only provided recommendations as to where to establish the school, its institutional structure and

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<sup>145</sup> See, for instance, Armstrong, "Colonial and Neocolonial Urban Planning"; William F. Banyikwa, "The Making of Hybrid Millionaire City in Dar es Salaam, Tanzania" in *African Urban Quarterly* 4 (3-4) (1989): 228-241.

<sup>146</sup> Retrieved from <http://www.aru.ac.tz/index.php/aboutus/history> on 12.08.2017.

<sup>147</sup> Jamhuri ya Muungano wa Tanzania, *Hotuba ya Waziri wa Ardhi, Nyumba na Maendeleo Mijini: Makadirio ya Fedha 1974/75* (Dar es Salaam: the Government Printer, 1974), 10-11.

<sup>148</sup> Kevin Fox, *Final Report: The Establishment of a Faculty of Architecture at the University of Dar es Salaam* (Dar es Salaam: University of Dar es Salaam, 1983).

<sup>149</sup> *Ibid.*, 3.

the general content of the curriculum. It did not provide details of buildings of the school nor the financial and manpower support for the school. Thus, the rest was left to the university and the government of Tanzania to decide. The two had to make decisions on manpower development, curriculum development and the construction of buildings.<sup>150</sup>

The implementation of the Irish report was bound to be deferred as the country was in the peak of the economic crisis discussed in Chapter V. To put it into perspective, one of the longest serving university Chief Academic Officer (CACO), a position now called Deputy Vice-Chancellor–Academic, asserts that most of the projects of the University of Dar es Salaam in the 1980s were executed “rhetorically.” He says that “economic decline . . . greatly affected all kinds of programmes offered by the UDSM.”<sup>151</sup> The establishment of the School of Architecture and Planning materialized in 1996 after the impact of the crisis had decreased as the country’s economy was stabilising. When it was founded, it became a University College of Lands and Architectural Studies (UCLAS) with only three PhD holders in the teaching manpower.<sup>152</sup> One of the three PhD holders was J M Lussuga Kironde, who had a PhD in urban planning and whose scholarly imprint is on the past and contemporary planning of Dar es Salaam. UCLAS offered undergraduate programmes in architecture, spatial planning and environmental engineering. By 2006, it had 43 PhD holders in its teaching staff, and it was offering undergraduate and postgraduate programmes, including PhD programmes. With such staff numbers, the UCLAS hierarchy began demanding that the government transform the college into a full-fledged university. The government agreed and transformed UCLAS into a public university in 2007. Upon attaining autonomy, they renamed UCLAS Ardhi University. Since its establishment, Ardhi University has been training many urban planners, architects, land evaluators and managers, as well as land economists and environmental engineers.

## 6.5 Conclusion

The late establishment of spatial planning and engineering training institutions supports our argument that the process of appropriating such important sciences in the governance and management of urban technologies did not occur in post-colonial Dar es Salaam. The country’s policy on science and technology as implicitly stated in the three Five-Year Development Plans did not seek to radically transform the colonial structures, which equated reading, writing and counting with education. For instance, von Mitschke-Collande considered some of the colonial legacies a

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<sup>150</sup> *Ibid.*, 12.

<sup>151</sup> Isaria N. Kimambo, “Conclusion” in *In Search for Relevance*, edited by I.N. Kimambo, B.B.B. Mapunda and Y.Q. Lawi (Dar es Salaam: Dar es Salaam University Press, 2008): 239-253.

<sup>152</sup> Retrieved from <http://www.aru.ac.tz/index.php/aboutus/history> on 12.08.2017.

poor perception of vocational education in Tanzania and the small number of technical institutions that were established in the country.<sup>153</sup> The change was witnessed in technical education, which moved away from the practice-oriented British tradition into the continental European tradition of being very academic or more theoretical. The country was also in need a critical mass of engineers and spatial planners for its vast urban infrastructure and projects. However, since the colonial period the education system has been producing a tiny mass of such professionals. That Tanzania was planning to have an education system that responded to local challenges was partly a reaction to the limitations of the colonial education system. The tiny mass of such professionals also created room for a sustained dependence on foreign experts for project planning and execution. To make matters worse, as von Mitschke-Collande depicted in 1980, engineering education in Tanzania emphasised more production development than maintenance and workshops.

As such sustainable technological appropriation capacities were not being built, most technologies were imported as black box with users only capable of using and operating but not repairing and maintaining them. The lack of skills to maintain and repair or make spare parts for the machines partly explains why the roads, drainage systems, buses and other technical systems in Dar es Salaam in the 1980s were worse than in any other period of the city's history. It also explains why, on 7<sup>th</sup> January 1990, President Ali Hassan Mwinyi called for technological appropriation by making technical education focus on developing repair and maintenance skills.<sup>154</sup> He was of the opinion that the vast local machines and industries, as well as roads and drainage that had been closed or damaged would become operational again only through repair and maintenance. Little, however, was done by the institutions concerned. At the University of Dar es Salaam, for instance, the Faculty of Engineering was still recovering from the effects of the economic crisis. President Mwinyi's call signifies a missed chance as the responsible actors from the Ministry of Education and the technical education institutions did not respond accordingly. The loose and implicit policy of science and technology thus remained heavily driven through industrialisation. In spatial planning, too, contrary to Allen Armstrong's argument that the 1979-1999 masterplan for Dar es Salaam contained local inputs, there was little appropriation of planning knowledge and practices owing to the lack of local and locally trained personnel. A Canadian political scientist, Leander Scheider, believes that the shortage of planning experts affected both urban planning and rural spatial planning. Schneider cited "a 1978 report on land planning in Tanzania" that complained

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<sup>153</sup> Von Mitschke-Collande, *Transfer and Development of Technology*, 145-173.

<sup>154</sup> *Mzalendo*, 07.01.1990

“about ‘acute understaffing’ and ‘a number of responsible posts being occupied by unqualified personnel.’”<sup>155</sup> As such the development of the urban sector was doomed to failure.

Traffic and drainage, as other large technical systems in Dar es Salaam, continued being unrepaired. As a result, when the third president of Tanzania, Benjamin William Mkapa, came to power, one of the major steps he took was to dissolve the City Council and to form a city commission whose job was to improve the quality of infrastructure. Established in June 1996, the Dar es Salaam City Commission (DCC) was to operate for a duration of three years. However, in 1999 it was given two more years to finish its task.<sup>156</sup> Whereas roads, the water supply, transport and solid waste management services improved significantly, drainage did not improve. Most of the streets in the city were still prone to floods and traffic jams because of storm water during the rainy season. This supports the argument that the infrastructural problems the city was facing were not only managerial as was touted by the Tanzanian government and the international agencies, particularly the World Bank and UNDP, in the enormous programmes that were dubbed “capacity building” programmes. The technological dimension of urban infrastructure was overlooked. The discussion of planning and engineering evolution in Tanzania in this chapter serves to illustrate why the drainage and traffic problems in Dar es Salaam have persisted even after the governance of the city has improved as was shown in other chapters.

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<sup>155</sup> Schneider, *Government of Development*, 113.

<sup>156</sup> *Daily News*, 18.10.1996; *The Guardian*, 06.12.1999.

## CHAPTER VII

### CONCLUSION

The discussions in the literature on urban Dar es Salaam have not explained the flooding events using a historical approach. The recurring floods in the streets of Dar es Salaam, both affluent and indigent streets, have been considered by social scientists as a recent problem in connection with the global climatic changes; and as a long-term problem resulting from the gradual sea level rise because the city is at shoreline of the Indian Ocean, central-east Tanzania. As a matter of fact, this study did not intend to negate the results of social science and environmental engineering research on floods. Instead, it sought to provide historical perspectives and explanations on the persistence of urban floods for over a century. With the social studies building on ethnographic methods such as observation and interviews on the people living in flood-prone areas, historical evidence did not find its way into the studies. Not until Frank Edward published an article entitled “Planned Vulnerabilities? Street Flooding and Drainage Infrastructure in Colonial Dar es Salaam”<sup>1</sup> that a historical perspective urban floods seemed to matter. Secondly, floods in Dar es Salaam, as demonstrated in the preceding chapters, affected the streets in which people live. It affected the historically most planned area situated far from the bigger river systems. The factors for flooding cannot be the same as they are in most towns and cities along the river valleys. They cannot be equated to floods like those facing South Sudan, Sudan, Egypt, Pakistan, Indonesia, India and Bangladesh, for instance, where they caused rivers to break their banks and destroyed dams or the low-land elevations along the seas. Surely, the factors for flooding in Dar es Salaam cannot be the same as what is discussed in Rohan D’Souza’s *Drowned and Dammed: Colonial Capitalism and Flood Control in Eastern India*. They cannot be the same even though the book uses a historical approach.<sup>2</sup> The answer should, therefore, be sought elsewhere.

The importance of a historical approach to flooding research is that it provides us with good and logical long-duration explanation. It provides room for understanding the connection between past developments and the present experiences. It proffers to us a platform whereby to understand the dynamics and continuities of not just flooding events but also people’s resilience

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<sup>1</sup> Frank Edward, “Planned Vulnerabilities? Street Flooding and Drainage Infrastructure in Colonial Dar es Salaam,” *HoST* 16, no. 1 (2022): 29-47; see also Tumpale Sakijege and Francis Dakyaga, “Going beyond generalisation: Perspective on the Persistence of urban floods in Dar es Salaam,” *Natural Hazards* (2022), online first publication at <https://doi.org/10.1007/s11069-022-05645-9>.

<sup>2</sup> Rohan D’Souza, *Drowned and Dammed: Colonial Capitalism and Flood Control in Eastern India* (New Delhi: Oxford University Press, 2016).

and coping strategies. In Chapter III, for instance, it was revealed that the natives of the modern-day city centre—the Zaramo—had avoided building houses on the water ways towards the Indian Ocean shoreline. The presence of such place names as Mchafukoge in the colonial records, both German and British records, as well as continued use of the name Mchafukoge to refer to a ward that is still facing floods in the 21<sup>st</sup> century, can only be understood when studied using a historical method. Such place names predate the advent of colonialism, and therefore, the modern urban flooding. This is food for thought for climate scientists without compromising their research narratives.

The second issue which this thesis adds into the flooding research is approaching urban floods from the historical dimension of technology. This study used interdependent urban infrastructure, drainage infrastructure and traffic infrastructure, to understand and discuss flooding that is not associated with rivers. While Andrew Karvonen's *Politics of Urban Runoffs* is a great work in the Global North, there is virtually no comparable work in the Global South. Secondly, like Karvonen, presents flooding as “the cultural and political implications of urban nature.”<sup>3</sup> Unlike Karvonen, this study is about drainage as a non-networked infrastructure that affects a networked infrastructure — traffic infrastructure. It is also a study not about the loss of human-nature relations in the Global South. It is mainly about how human populations made themselves vulnerable to flooding as they developed streets through road and housing building, with and without plans. Finally, the study provides not only a historical method but also invites us to consider the indicators of the flooding problem and how they evolved over time. In particular, in Chapters III and V, I indicated how the lack of a repair and maintenance culture in colonial and post-colonial Dar es Salaam implied flooding events could not be avoided even in the city centre where there was a combined drainage system.

The fusion of urban and technological dimensions indicates that the drainage and associated traffic infrastructural problems are not completely natural. Rather, they are caused by man-related activities and processes which have unfolded over time. As technology is essentially a product of human ingenuity in his daily life pursuits and in his constant interaction with nature, it is logical to argue that the drainage problem in Dar es Salaam was the result of a host of interconnected forces, processes and decisions made by humans. They include such things as colonial urbanisation visions, the circulation of engineering designs and culture, spatial planning and urban governance, all of which have featured in various parts and chapters of this thesis.

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<sup>3</sup> Andrew Karvonen, *Politics of Urban Runoff: Nature, Technology, and the Sustainable City* (Cambridge & London: The MIT Press, 2011).

### **7.1 Dialectical Circulation: Beyond One-Way Circulation and the Appropriation Narrative**

This study is a history of technology, which is positioned in studies on urban infrastructure. It did not seek to justify the declensionist narrative, which underscores deficiencies in the provision of urban infrastructure in the post-colonial Global South. Some of the studies on infrastructure in the Global South tend to develop accounts which portray infrastructural services like the water supply, drainage provision, power and road building as having deteriorated during the post-colonial era. They present the colonial era as a period in which there was some stability in service provision. This study agrees that most of the modern urban infrastructural services, or urban technologies to be precise, were introduced during colonialism. They were circulated from the Global North to the Global South through the agency of colonial actors. It also affirms that they were not established in their completeness or in the exact designs as they exist in the Global North. Incompleteness was a function of technological representation; and racial, economic or political factors. Incompleteness made the provision of infrastructure assume the state of splintering or duality. However, the study – using the case of drainage and traffic infrastructures, negates the declensionist narrative premise that infrastructure deficiencies began in the post-colonial period. It contends that deficiencies began in the colonial period and persisted to the post-colonial Global South. It supports the continuity thesis.

Most social science studies have, as a result, tended to focus on capturing features of the recent infrastructural service provision, particularly on how the local people evolved their own solutions in the context of inadequate, incomplete and splintered infrastructure. The studies are characteristically contemporaneous in their accounts because their descriptions are about the current people's agency. Long-term dynamics and perspective in the provision of infrastructure do not get the space it deserves in such works, leading to the imagery that depicts infrastructural services as unchanging. The accounts of local people's solutions become part of the declensionist narrative because they are indicators of the deficiencies in the provision of infrastructure. Examples of works on urban infrastructure that fall into the ploy of the declensionist narrative in Dar es Salaam include Sarah L Smiley's "Heterogenous Water Supply in Dar es Salaam: The Role of Networked Infrastructures and Alternative Systems in Informal Areas" and Jochen Monstadt and Sophie Schramm's "Toward the networked city? Translating technological ideals and planning models in water and sanitation systems in Dar es Salaam."

Providing an understanding of how the drainage problem unfolded is important because it helps us to account for the current contexts and to be in a position to suggest sustainable solutions. One can also explain the patterns of urban change and transitions through the changing drainage regimes and perspectives not only in Dar es Salaam but also in other Global South cities. Bearing



in mind that the drainage infrastructure and the traffic infrastructure are matters of relevance to urbanites from their designing and controlling their problems, the contribution of this discussion is just and timely to historians and social scholars of technology and urbanisation. This position considers the long-held conception of history in which history is defined as “the ‘first order’ study of past actions, events and situations.”<sup>4</sup>

In this historical work, emphasis is put on the long *durée* in the provision of infrastructure. It goes beyond providing accounts of networked and splintered infrastructural services by delving into continuities and changes in the design, distribution and politics of urban technologies. Using two intersectional urban technologies – drainage infrastructure and traffic infrastructure – the study underscores the need to adopt a new analytical tool. *Dialectical circulation* is the analytical tool recommended in this study. The tool draws inspiration from the existing technological circulation accounts. It also draws inspiration from the concept of dialectics as defined in the philosophical strands of Hegelian idealism and Marxian materialism.<sup>5</sup> From circulation stories it seeks to highlight on the movement of technological ideas, knowledge, materialities and practices, regardless of their origin. For that reason, dialectical circulation embodies this technological circulation and disentangles it from all non-technological circulations. Technological circulations are seldom ideologically free. A historian of technology, David E Nye, substantiated this in one of his publications when he said that “the axe, the mill, the canal, the railroad, and the dam stand at the central of stories about how European-Americans naturalized their claim to various regions of the United States.”<sup>6</sup> This means that when we analyse urban technologies such roads and drainage, we need also to look at the values embedded in the circulation, planning, designing and construction processes. There are values which are created in these processes. It has been demonstrated in Chapters III and IV how the British used spatial planning to segregate Dar es Salaam residents on the basis of race, thereby justifying unequal provision of social and infrastructural services.

Furthermore, these processes do not occur in a vacuum. They usually take place in certain social contexts, in space and time, locally and globally, North and South. This implies that the infrastructure which results from such processes bear certain levels of complexity that can only be detected using the dialectical approach. By the dialectical approach we mean an approach that

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<sup>4</sup> R.F. Atkinson, *Knowledge and Explanation in History: An Introduction to the Philosophy of History* (London & Basingstoke: The Macmillan Press Ltd., 1978), 6.

<sup>5</sup> On Marx influence see Kurt Beck, Gabriel Klaeger and Michael Stasik, “An Introduction to the African Road,” in *The Making of the African Road* edited by Kurt Beck, Gabriel Klaeger and Michael Stasik (Leiden and Boston: Brill, 2017), 3.

<sup>6</sup> David E. Nye, *America as Second Creation: Technology and Narratives of New Beginnings* (Cambridge and London: The MIT Press, 2004), 5.

“views things insofar as they are internally related and ... insofar as they are externally related.”<sup>7</sup> The approach enables us to understand actors (agency), technology and the relations between them with respect to knowledge, practices and the materialities produced in their relations. This means that it borrows from the Hegelian and Marxian exposition of reality and knowledge an exposition that views the two as products of factors or agencies which work in opposition to one another and which change over time.<sup>8</sup>

When Mikael Hård and Thomas Misa discussed the concept of ‘circulation’ in 2008, they sought to explain how ideas, artefacts and practices are spatially and temporally appropriated. Their conceptual scope was global, although their spatial analysis emphasised the Global North at the expense of the Global South. They were not the first to hint that this circulation can take place through the movement of ideas and practices, publications, conferences and exhibitions or the movement of people through study trips.<sup>9</sup> Writing in the 1970s, Walter Rodney, a revisionist Marxist of African history, argued that, in order for any society to make a technological breakthrough, two or all three of the following factors are necessary. The first factor is the “existence of a demand for more products than can be made by hand.”<sup>10</sup> In that case, technology is considered as an instrument for meeting a certain need. The second factor is the presence of “a spirit of scientific inquiry closely related to the process of production.”<sup>11</sup> This factor is associated with the first in that more demand for artefacts stimulate change in processes as well as in the knowledge connected to production. It creates room for innovation. These factors are from within the society in which the need has risen. When discussing the evolution of urban technologies, many technological innovations took place because of local circumstances. Writing in his *Green Infrastructure for Sustainable Urban Development in Africa*, John Abbott shows how the growing demand for clean water and the 1854 revelation of ground water as not being safe for urbanite consumption, transformed the water supply infrastructure, public health and epidemiology in Britain before circulating to other parts of the world in the 19<sup>th</sup> and 20<sup>th</sup> centuries.<sup>12</sup>

The third and final factor, according to Rodney, which Hård and Misa call “international circulation” is the “borrowing of technology.”<sup>13</sup> Rodney provides an example of non-European

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<sup>7</sup> Roger E. Bissell, “Reply to Roderick Long: Mistaken Identity: Long’s Conflation of Dialectics and Organicism”, *Journal of Ayn Rand Studies* 3, no. 2 (2002), 353.

<sup>8</sup> For poignant introduction to the Hegelian and Marxian dialectic see Robert C. Tucker, *The Marx-Engels Reader*, 2nd Edition (New York: Norton, 1978).

<sup>9</sup> Mikael Hård and Thomas J. Misa, “Modernising European Cities: Technical Uniformity and Cultural Distinction” in M. Hård and T. Misa eds., *Urban Machinery: Inside Modern European Cities* (Massachusetts: The MIT Press, 2008), 1-20.

<sup>10</sup> Walter Rodney, *How Europe Underdeveloped Africa* (London: Bogle-L’Ouverture, 1972), 104.

<sup>11</sup> *Ibid.*, 105

<sup>12</sup> John Abbott, *Green Infrastructure for Sustainable Urban Development in Africa* (New York and Abingdon: Earthscan, 2012), 75-77.

<sup>13</sup> Hård and Misa, “Modernising European Cities.”

and non-American technological circulation influenced by the political actors in modernisation of mid-19<sup>th</sup> century Japan. Japan started its modernisation after sending some Japanese to America to study industrial and engineering technologies. As a result, by 1900 Japan was an emerging industrial power capable of saturating local demand and exporting finished goods.<sup>14</sup> In this latter factor, the demand goes beyond the production processes. Moreover, technological exchange is one-way traffic and the outcome is largely a homogenous modernity. Rodney and many other commentators of Western imperialism invariably argue that technological circulation has been predominantly unilateral and unequal, from the Global North to the Global South. Where circulation was equal and two-way, as historians of technology Pursell, Hård and Jamison show, it was between Western Europe and North America.<sup>15</sup> It is ostensibly clear that the modern urban technologies in Dar es Salaam circulated from elsewhere during the colonial period. In Bill Freund's typologies of African cities, Dar es Salaam is essentially a colonial city.<sup>16</sup> While the appropriation concept can be understood well through the prisms of organisational and splintering urbanism, circulation cannot be comprehended well through the existing model suggested by Hård and Jamison and many other scholars.

The agency implied here is at both the origin and destination of circulating technologies. Through this agency analysis we can explain the innovation of urban technologies that occur on both sides of circulation. This is the case because circulation occurs through a back-and-forth flow, analogous to the two-way traffic movement. This project distinguishes its contribution to circulation accounts by revealing that there has been a two-way traffic circulation of technology between the Global North and the Global South during and after the colonial period. This kind of circulation barely gets mentioned in the dominant circulation discourses. In Africa, for instance, the historians David Arnold and David Edgerton have given accounts of technological circulation and innovation from the Global North to the Global South.<sup>17</sup> While pointing that there have been active agencies of change in the two destinations, like changing the use of the circulated machines and devices, none of them has given an account of changes in their origins. Hence, their endeavour to disentangle themselves from the old diffusion theory is marred by their inability and/or unwillingness to discuss changes and innovations in both ends.

It is argued in this thesis that technological circulation in urban contexts between the Global South and the Global North had some importance to the parties involved in many ways.

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<sup>14</sup> Rodney, *Europe Underdeveloped Africa*, 106.

<sup>15</sup> See Mikael Hård and Andrew Jamison, *Hubris and Hybrids* (London: Routledge, 2005); Carroll Pursell, *The Machine in America* (Baltimore: Johns Hopkins University Press, 2007).

<sup>16</sup> Bill Freund, *African City: A History* (Cambridge: Cambridge University Press, 2007).

<sup>17</sup> See David Edgerton, "Creole Technologies and Global Histories: Rethinking How Things Travel in Space and Time," *HoST* 1 (2007), 75-112; David Arnold, "Europe, Technology, and Colonialism in the 20<sup>th</sup> Century," *History and Technology* 21, no. 1 (2005), 85-106.

While its importance in the Global South is known and needs no mention here, its importance to the Global North is barely known, and is yet to be researched. This study identifies three main areas in the Global North that benefited from this interplay. These are architectural design, the engineering profession and infrastructure tourism. These are discussed in relation to how imperialism intersected with urbanism. According to the essays in *Imperial Cities*, edited by Felix Driver and David Gilbert, most of the public buildings in cities like London, Paris, Rome, Vienna, Glasgow, Marseilles and Seville reflect the imperial control of other areas in the world. Similarly, there are structures and infrastructure that have been built to attract tourists to such cities. The irony is that they use features found in the Global South, not the cities themselves. A good example is the London Underground, some of whose stations are named after places or areas in the Global South and they have been painted wild nature found in the South.<sup>18</sup>

Technological circulation was also important to the engineering profession itself. Infrastructure projects in the Global South made the engineering profession prosper by offering employment to engineers at home and abroad, by founding networks like the Institution of Civil Engineers (ICE) and by disseminating knowledge through journals on projects undertaken in the Global South. The historian Sebastian Beese contends that, from 1907, German engineering graduates applied for jobs in the colonies in Africa in large numbers.<sup>19</sup> They considered Africa a launch pad of their engineering careers. Andrew Zimmerman has also shown how the German colonies were very important in the production of knowledge, not only to the renown scientists such as Robert Koch but also to anthropologists like Karl Weule. Weule even hired local artists to draw pictorial illustrations at a time when he was unable to afford a camera.<sup>20</sup> This scientific and technological importance of the Global South was put in the background. The agency of actors from Global North was hailed at the expense of the agency of actors from the Global South. This work, therefore, recommends the adoption of the dialectical circulation concept, if we really want to place “African agency” in technological histories, as Olúfémi Táíwò has argued.<sup>21</sup>

Additionally, Casper Andersen shows how British engineers were split into two groups: consultant and field engineers. Consultant engineers resided in London and their functions were to solicit, plan and design projects to be implemented in Africa, Asia and Australia. Field engineers were involved in implementing the projects in the Global South. After the founding of ICE in

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<sup>18</sup> Felix Driver and David Gilbert, *Imperial Cities: Landscape, Display and Identity* (Manchester and New York: Manchester University Press, 2003).

<sup>19</sup> Sebastian Beese, *Experte der Erschließung: Akteure der deutschen Kolonialtechnik in Afrika und Europa 1890 bis 1943* (Leiden: Brill, 2021).

<sup>20</sup> Andrew Zimmerman, “What Do You Really Want in German East Africa, Herr Professor?: Counterinsurgency and the Science Effect in Colonial Tanzania,” *Comparative Studies in Society and History* 48, No. 2 (2006): 419-461.

<sup>21</sup> Olúfémi Táíwò, *Against Decolonisation: Taking African Agency Seriously* (London: Hurst & Co., 2022).

1834, engineers in London established a library and journal. Thus, they became important in imperial and colonial politics. Andersen says that “the Westminster consulting engineers were affluent, vocal, influential and self-confident”<sup>22</sup> which implies that they became a strong pressure group. Despite such networks and identities propping up in the engineering profession, Andersen warns that the engineers place in the colonial project did not lead to monolithic views, responses and exchanges between Britain and its vast colonies.<sup>23</sup> This explains why designs and the built infrastructure like drainage and traffic infrastructure in the Global South differed from those built in the Global North. This reality is also demonstrated in a cultural anthropology study of roads in Africa in which appropriation is defined as “a dialectical process of turning something that is alien, new and unfamiliar into one’s own.”<sup>24</sup> We should not ignore the truth that “the ability to illuminate reality is an important measure of the reliability of a theory, and an indicator of its truth. The best theory is thus likely to (sic!) the one that is able to fit in observations and experiences most elegantly, most simply, most comprehensively, and most fruitfully.”<sup>25</sup>

The management of storm water is a critical to making the traffic infrastructure durable, resilient and usable by pedestrians, cyclists and motorists. In the urban areas, the lack of proper storm-water management implies that the areas are prone to flooding and that may lead to a halt or obstruction in vehicular and people’s mobility owing to traffic jams. It also implies damage of roads through the resultant potholes and weathering away of the roadsides. All these have serious economic implications as they halt transport and require more funds for maintaining the roads. In simple terms, storm water makes the traffic infrastructure vulnerable to damage or flooding. This underlines the importance of another kind of infrastructure – the drainage infrastructure. Critical studies on infrastructure would treat drainage as a critical infrastructure because of its importance to traffic infrastructure. Throughout this thesis, an attempt has been made to demonstrate the technical interdependence between the traffic and drainage infrastructure in Dar es Salaam.

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<sup>22</sup> Andersen, *British Engineers and Africa, 1875-1914* (London: Pickering and Chatto, 2011), 7.

<sup>23</sup> *Ibid.*, 31.

<sup>24</sup> Beck, Klaeger and Stasik, “An Introduction to the African Road”, 2.

<sup>25</sup> Alister McGrath, “Faith, Proof and Evidence: What’s Right to Think?”, retrieved from [www.gresham.ac.uk](http://www.gresham.ac.uk) on 25<sup>th</sup> November 2015.



**Figure 7.1:** Surface Concrete Lined Drains on New Street Roads in Dar es Salaam  
*Source: Photograph by Frank Edward (author) July 2017.*

To understand the relationship between the two kinds of infrastructure, we examined planning and engineering practices by analysing spatial planning documents such as master plans as well as technical reports of public works, medical departments and various government official correspondences. Through the infrastructure focus, this study has unfolded layers of political and technological decisions that caused the control of floods to be delayed or skewed. For instance, in the colonial days, flood control was more medicalised so as to control water-borne diseases like malaria and paid little attention to the protection of the traffic infrastructure. In the post-colonial era, things changed. Floods control focused more on the protection of the traffic infrastructure than on disease control. This was realigning the functional significance of drainage infrastructure. This means that a change in political terrain can be transcendental to urban technologies. This is a change in regimes not only a change from colonial to postcolonial regimes but also from one party to another in democracies. Considering such a changing and complex terrain of flood control, and considering that flood control was affected by the planning and engineering practices circulated from Global North and appropriated through technical actions and the establishment of training institutions, one may be tempted to apply the concept of synchronisation that elaborates

technological change rhythms, as suggest by Jens Ivo Engels.<sup>26</sup> The concept helps to unveil dialectical processes in technological circulation, and therefore elaborates further the concept of dialectical circulation. As such, we are able to explain how drainage and traffic infrastructure reflect a web of dynamic relationships between different actors and forces, a quartet relationship between the state, people, space and science. Future studies on drainage and traffic infrastructure in other cities in the Global South may apply the dialectical circulation concept as they seek to understand the entanglement of flooding and techno-political processes of various local and global actors.

## **7.2. A Century of Flooding: Urban Road Vulnerability and the Absence of Preparedness**

When the Germans planned Dar es Salaam City in the 1890s, they introduced for the first time the large technical systems in what is today Mainland Tanzania. As shown in Chapters II and III, the large technical systems included street roads, the water supply, sanitation, drainage, power and telegrams. Most of these technological materialities were new not only in the location but also to the people. Any new technology comes with a certain set of knowledge and practices which have to be embraced by the designers and users in order for it to make sense and become useful in everyday life. The combined new technologies, knowledge and practices are what Bijker, Hommels and Mesman call “new technological cultures”.<sup>27</sup> A technology can bring about a new technological culture if it is novel in an area even if it existed before in another area. Thus, the technologies that the Germans introduced for the first time in Dar es Salaam were common in Europe. They were introduced in the city as part of the larger colonisation project. They were used to ‘civilise’ the Dar es Salaam. The locals learnt to work on them by maintaining, repairing and using them. The locals learnt the new knowledge, practices and materialities. It was the articulation of technological cultures which became part and parcel of their lives, and through this articulation, they appropriated the modern technologies from the Global North.

But as Bijker, Hommels and Mesman argue, all technological cultures are prone to intrinsic or external vulnerabilities. They can be subject to internal failures and human activities, or they can fail because of natural events such as floods, earthquakes and other types of natural hazards. Thus, vulnerability is one of the properties of the technological systems we have in the world. When infrastructure is being built, there is a sense of recognition that it will fail sometimes. This sense is shown by the presence of maintenance and repair knowledge within engineering cultures. But to

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<sup>26</sup> Jens Ivo Engels, “Rhythm Analysis: A Heuristic Tool for Historical Infrastructure Research,” *Technology and Culture* 63, no. 3 (2022): 830-852, here at 837.

<sup>27</sup> Wiebe Bijker, Anique Hommels and Jessica Mesman, “Studying Vulnerability in Technological Cultures” in *Vulnerability in Technological Cultures: New Directions in Research and Governance* edited by A. Hommels, J. Mesman and W. Bijker (Cambridge and London: The MIT Press, 2014): 1-26.

what extent can the maintenance and repair works done routinely differ from one place to another and from one historical moment to another. In general terms, as many scholars on maintenance and repair reveal, building is given higher regard than maintenance and repair.<sup>28</sup> In other words, the preparedness levels are lower. Consequently, societies continue being prone to the vulnerability of technological cultures for a long time.<sup>29</sup>

Studies on infrastructure vulnerability, like those on maintenance and repair, mainly began in the last two decades. In a way, terrorist attacks made technologists and scholars seek to examine and understand the theoretical and empirical dimensions of critical infrastructure, vulnerability, preparedness and resilience. Every technological system is now not only understood by how it is built, maintained and repaired but also by how it is critical and vulnerable in order to increase the levels of preparedness and resilience when extraordinary events affect them. Some of the publications devoted to these themes are Mark Pelling and Ben Wisner's *Disaster Risk Reduction* (2009); Per Högselius' et al. *The Making of Europe's Critical Infrastructure* (2013); AniqueHommels' et al *Vulnerability in Technological Cultures* (2014); Jens Ivo Engels' *Key Concepts for Critical Infrastructure Research* (2018); and Stephen J. Collier and Andrew Lakoff's *The Government of Emergency* (2022). These studies applied multidisciplinary approaches to developing efficient adaptation strategies. Of all, the most multidisciplinary study is the ongoing 'EmergenCITY' project at TU Darmstadt in the state of Hessen, Germany, whose objective is "to protect smart cities from disasters."<sup>30</sup> These works are important in a number of ways. First, they initiate and expand conceptual and theoretical debates about the concepts of vulnerability, criticality, preparedness and resilience. They fill the research gap that existed for a long time. Secondly, most of them help us to understand the real risks and dangers modern infrastructure face and provide us with an understanding that may help to develop adaptive solutions in future. Thirdly, they demonstrate how interdisciplinarity can be embraced in academia and in the governance of infrastructure. However, they share one lacuna: they do not explore past experiences – say beyond three decades. We know more about the present and the future, but not about the past as well.

This work has attempted to demonstrate that there is much we can learn from historical evidence regarding the vulnerability of infrastructure and how knowledge of building preparedness evolved over time and space. The floods that faced the city roads, users and their property such as houses and vehicles reveals varieties of vulnerability. Thus, apart from the common system and

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<sup>28</sup> See, for instance, Frank Edward and Mikael Hård, "Maintaining the Local Empire: The Public Works Department in Dar es Salaam, 1920-1960," *Transport History* 41, no. 1 (2020), 27-46.

<sup>29</sup> See Stephanie Eifert, Alice Knauf and Nadja Thiessen, "Vulnerability," in *Key Concepts for Critical Infrastructure Research* edited by Jens Ivo Engels (Wiesbaden: Springer VS, 2018), 24.

<sup>30</sup> See "Emergency Responsive Digital Cities" in <https://www.emergencity.de> accessed on 11.03.2022.



user vulnerabilities identified by Per Högselius and others,<sup>31</sup> property vulnerability is considered in this work. Property vulnerability is mentioned in studies by Kebede and Nicholls.<sup>32</sup> The latter study assesses the impact of flooding on property such as housing, cars and other personal items. The opening quote in this work indicates how the roads were vulnerable to flooding, which affected people's mobility. But the road users were also vulnerable to floods as they travelled to and from work. In the subsequent chapters, it was demonstrated how the road users' property such as houses were inundated by water that had over-flooded street roads.

The vulnerability of roads to flooding is a vivid indicator of how storm-water drainage is critical. With a good functioning drainage system, the city government could save financial resources that could otherwise be used to restore street passability and resilience during flooding that occurred year after year. The users could also rest assured that their property was safe and sound. A century of flooding in Dar es Salaam, however, has revealed that some government officials and civil engineers knew of the importance of properly installed drainage to the traffic infrastructure. Their acknowledgement of such importance was more reactionary –an afterthought of sorts– than preventive. Most of the roads were built without any drains. This explains why flooding events occurred from 1913 to the recent past. However, this explanation highlights the nature of civil engineering cultures that persisted in the colonial and post-colonial cultures. By engineering cultures, we mean the practice of building infrastructure using a certain method or design. In that case, the colonial and post-colonial municipal engineers built roads that lacked drains for technical and extra-technical reasons. The technical reasons were that they were used to build colonial roads without proper drainage. The extra-technical reasons include racism and the lack of political will to provide better equipped roads in the urban streets in colonial Africa, especially if the roads passed through Africans' streets. This means that splintering urbanism did not occur only in the visible technological artefacts but also on the discursive and theoretical level.

The historical vulnerability of the traffic infrastructure in Dar es Salaam shows us that it is important to consider drainage infrastructure during the construction of roads – the traffic infrastructure. We are reminded that maintenance and repair are not efficient, if another kind of critical infrastructure is lacking. Maintenance and repair alone render the desire for future resilience of infrastructure to be pre-empted. The persistence of floods in Dar es Salaam also tells us how the intention to control disease usurped the main drainage function, the function of making the traffic infrastructure resilient to floods. In simple terms, addressing one vulnerability at the expense

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<sup>31</sup> See Per Högselius et al., *Common Connections and Shared Vulnerabilities* (Basingstoke: Palgrave Macmillan, 2013), 40, 266.

<sup>32</sup> See Abiy S. Kebede and Robert J. Nicholls, "Population and Assets Exposure to Coastal Flooding in Dar es Salaam (Tanzania): Vulnerability to Climate Extremes", A report submitted to Stockholm Environment Institute, Stockholm, Jan. 2011.

of another only postpones the other vulnerability temporarily. Chapters III and IV have shown how storm-water drainage received great attention when the objective was to control floods that provided ideal conditions for the eruption of epidemics, but not when they damaged roads. We have also seen how certain areas were technologically alienated in terms of the installation of proper drainage for racial and political reasons. Consequently, most of the roads were characterised by poor levels of preparedness against flooding. Contrary to the past, in Figure 7.1 above, we saw that the current engineering culture in Dar es Salaam is taking into account the importance of installing traffic infrastructure with storm-water drainage.

As such, we recommend that studies on vulnerabilities should also examine the vulnerability of infrastructure which was ignored in the past so that a nuanced understanding of vulnerabilities is obtained. We also recommend exploring flooding cases from the Global South in order to broaden our understanding of vulnerabilities. Such studies could adopt comparative approaches. Apparently, most studies on vulnerability and critical infrastructure are undertaken in an isolated manner. If the world is becoming homogenised and urban areas are becoming more and more 'ordinary' by possessing similar kinds of infrastructure, undertaking global studies may lead to the generation of a more fruitful knowledge that could be used to produce reliable and sustainable solutions to unwarranted events against infrastructure.

## POSTSCRIPT

This study has generated knowledge that could be used to reflect on the occurrence of floods in Dar es Salaam, Tanzania. It offers historical insights not only into the contemporary urban officials, urban planners and city engineers but also into scholars of urban infrastructure. In this postscript, I call for the contemporary climate change narrative to incorporate a historical perspective in researching and explaining floods in the Global South cities and towns. Climate change scholarship is proliferating because of the availability of funding and researchers' interest in issues relating to climate change at a time when climate hazards are increasing. Flooding is one of climatic hazards. While not all floods can be associated with the impact of climate change, most of the recent floods have been linked to such change. Until recently, studies had been seeking to establish the relationship between climatic floods and how the communities affected by floods could adapt to such floods by developing resilient architecture and undertaking resilient livelihood activities.

In the endeavour to examine the impact of floods and suggest resilient strategies, the possible solutions to flooding, spatial planning and engineering cultures that are topographically and morphologically sensitive have been overlooked or taken for granted. Through the adoption of *usable past* concept appearing in historical studies of technology and environmental history it is highly possible to develop sustainable solutions to floods.<sup>1</sup> This solution-oriented perspective was part of this study, but not in many other studies the history of technology and environment. There are pros and cons of moving in this direction. On the positive side, demonstrating the relevance of history, especially showing how the discipline is undergoing dynamism, historians are trying to assert their presence in contemporary debates of environmental hazards by not only explaining the present using the past but also by charting into deep waters of recommending the way forward by emulating some of the approaches used by social scientists. Historians' move has come at a time when calls for multi-disciplinarity are increasing. In other words, the historians are proactive.

In climate change research, historians and the discipline are in a good position to provide the long-term climate data and other geographical factors that have also been overlooked when justifying the recent consequences of climate change. They offset the lacuna of social science research which are very contemporaneous and futuristic in their accounts of floods. Through their critical eye, historians can provide a past perspective for strengthening the suggested resilient and sustainable paths. In climate change research, the historian Daniel R. Headrick has demonstrated how this can be done. In his article entitled "Climate Change: Debate and Reality," Headrick

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<sup>1</sup> Timothy Moss, "Technikgeschichte für heute: Formate der Vermittlung", *TG Technikgeschichte* 88, no. 4 (2021), 385-390

provides comparisons of the past and present climatic data in trying to prove that climate change is real at global level.<sup>2</sup> The narrative that climate change is a hoax get weaker and weaker when one reads such works.

If at all this thesis has added knowledge to the climate change accounts on Dar es Salaam floods, then it is the offering of historical evidence that shows the relationship between technology, spatial planning and floods over a century. A recent urban planning study on the multiplicity of factors for flooding in Dar es Salaam has found a great usefulness of the historical perspective. The study has also identified more natural factors for the persistence of floods which are topography, morphology and weather of the city. These factors have for a long time assumed constancy. The international agencies are the World Bank and the UNDP, which have not only commissioned studies but also funded improvements of both drainage and traffic infrastructure, as was shown in Chapter V of this thesis, have partially started taking into account of those natural factors. Through their initiative, even the local traffic engineers have begun appropriating some historical insights into the vulnerability of traffic infrastructure caused by the lack of drainage infrastructure. Consequently, over the past decade, there has been a policy, which compels road builders to develop designs of roads that incorporate storm-water drains. This policy, I contend, serves to prove that the problem of flooding is not merely climatic but also socio-technical, and therefore needs both socio-technological and nature-related solutions.

### **Beyond Climate Change and Land-Submergence Causes of Flooding**

Floods have been persistent in Dar es Salaam, with records indicating that they have affected the city since the 1910s. The scale of the impact of floods grew as the city boundaries expanded. Within the technocratic circles, local and global, Dar es Salaam is understood as a flood-risk area. The causes differ from one study to another. A recent study by the World Bank, for instance, reveals that Ilala District and Municipality is naturally prone to flooding, especially alluvial flooding.<sup>3</sup> The World Bank experts have noted that a large part of the district falls within a river valley – the River Msimbazi Valley and the storm-water path that runs from Ukonga to the CBD, parallel to Nyerere Road. Against this geo-morphological background, history indicates Ilala District is the seat of the city's urban history; it carries the nation's modern political and diplomatic history by being home to State House, embassies and international agencies.<sup>4</sup> It is the only area in Tanzania that has undergone German, British and post-colonial spatial planning. This information was ignored by

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<sup>2</sup> Daniel R. Headrick, "Climate Change: Debate and Reality," *International Review of Environmental History* 5, no. 1 (2019), 43-60.

<sup>3</sup> The World Bank, *Satellite Monitoring Service of Urbanization in Africa: Final Report* (October 2021).

<sup>4</sup> In this connection see a recent publication by George Roberts, *Revolutionary State-Making in Dar es Salaam: African Liberation and the Global Cold War, 1961-1974* (Cambridge: Cambridge University Press, 2021).

the regimes of spatial planning in Dar es Salaam for over a century. The previous regimes understood that floods could affect only the banks and areas near the mouth of the River Msimbazi. In simple terms, the planning regimes argued that the flood-risk area was the land bordering the river valley, especially the lowlands. Hence, the residential areas in Ilala District, as long as they were distant from the River Msimbazi Valley, were perceived as being free from floods. The natural configuration of lands was not studied in its entirety. As records indicate, the flooding that affected the city was only viewed as a seasonal problem that deserved temporary solutions.

In Chapters II and III of this work, evidence was provided to support the argument that the planners and builders of streets and drainage in Dar es Salaam did not consider the configuration of land seriously. Superimposed spatial plans did not suggest shifting the location of the city centre even after the centre had experienced perennial flooding. In 2009, an edited volume on disastrous hazards in urban Africa identified flooding and a rise in the sea level as climatic disastrous hazards. The volume sought to challenge the then existing narratives, which presented the continent as rural area whose “disasters are caused by drought and that” it “relies on international support to manage disaster risk.”<sup>5</sup> By challenging these long-established narratives that dominated international research and policies on the African continent, the essays in the volume posited that Africa was becoming increasingly urban and that urbanisation was unleashing a host of hazards or Africa was becoming prone to climate-related hazards.

There is a consensus among climate change scientists that cities are responsible for up to “70% of greenhouse gas (GHG) emissions”<sup>6</sup> because of the preponderance of what the historian Daniel R Headrick calls a culture of consumerism.<sup>7</sup> The Global South cities, even if they have historically contributed less emissions of GHG, are prone to irregular and massive rains caused by climate change which eventually cause unprecedented floods. Such floods increase the cost of traffic infrastructure, property and lives more in the Global South than in the Global North because the low level of preparedness. That the effects of climate change include flooding and affect more the Global South populations is substantiated by case studies from select African cities, including Dar es Salaam. It is also supported by international organisations, particularly the UN-HABITAT and the World Bank. Below, I provide an exposition of some studies which have associated with climate change and the rise in sea level with flooding in Dar es Salaam. I also suggest possibilities of employing past knowledge in developing sustainable and resilient mechanisms against such flooding.

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<sup>5</sup> Mark Pelling and Ben Wisner eds., *Disaster Risk Reduction: Cases from Urban Africa* (London: Earthscan, 2009).

<sup>6</sup> Yong Tu, “Urban Debates for Climate Change after the Kyoto Protocol”, *Urban Studies* 55, no. 1 (2018): 3-18, here at 4.

<sup>7</sup> Daniel R. Headrick, “Climate Change: Debate and Reality,” *International Review of Environmental History* 5, no. 1 (2019), 52-56.

Urban planners and environmental engineers have associated the floods that occur in Dar es Salaam with climate change. An urban planner, Regina John, undertook a study that concluded that climate change and rapid urbanisation were the main causes of flooding in Dar es Salaam. John's main objective, however, was to understand "specific potentials and limits in households in adapting to flooding using a specific case of an informal settlement." In her case study of the Magomeni Suna settlement, John found that "the total number of houses is 770 of which 350 are estimated to be exposed to frequent floods."<sup>8</sup> John does not state explicitly that the area became a settlement in the post-colonial period and that the history of flooding did not exist as there were no human activities in the area. It became prone to floods when humans moved in and constructed buildings and structures for settlement. It is largely a 'valley' area bordered by the River Ng'ombe in the north and the River Msimbazi in the south — a typical hazard area. Since John's study is explored adaptation strategies in order to help the residents cope with floods, it presents a gloomy picture which can be interpreted as accepting the permanency of flooding in a hazardous valley. The fact that the area is very close to the mouth of the River Msimbazi, less than 1 km, it is not completely right to associate floods with climate change and urbanisation alone. Developing coping strategies against the flooding triggered by climate change in the similar water path areas is also touted by many scholars in Stephan Pauliet et al (eds.), *Urban Vulnerability and Climate Change in Africa*.<sup>9</sup> The policy should focus on removing people from the outright hazardous area, rather developing strategies to perpetuate vulnerability by enabling them to continue living in the area.

Environmental engineers, Abiy S Kebede and Robert J Nicholls from the University of Southampton, conducted a study by doing an elevation-based geographic information systems (GIS) analysis to explain the causes of floods in Dar es Salaam. They concluded that "about 8% of the land area of Dar es Salaam" lies below the 10m contour line and that, by 2005, it was "estimated that over 140,000 people" were living below that contour level.<sup>10</sup> The study projects that, by 2070, about "213,000 people and infrastructure assets worth between US\$8.9 and US\$9.8 billion" would be beneath that contour level.<sup>11</sup> According to Kebede and Nicholls, an area being underneath a 10m contour level implies that the area is exposed to flooding. Such areas are Msasani Bonde la Mpunga, Kunduchi, Mikocheni, the Msimbazi Valley and Jangwani. They go further to identify the

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<sup>8</sup> Regina John, "Flooding in Informal Settlements: Potentials and Limits for Household Adaptation in Dar es Salaam City, Tanzania", *American Journal of Climate Change* 9 (2020), 68-86, here at 71 and 72.

<sup>9</sup> Stephan Pauliet et al. eds. *Urban Vulnerability and Climate Change in Africa: A Multidisciplinary Approach* (Heidelberg: Springer, 2015).

<sup>10</sup> Abiy S. Kebede and Robert J. Nicholls, "Population and Assets Exposure to Coastal Flooding in Dar es Salaam (Tanzania): Vulnerability to Climate Extremes", A report submitted to Stockholm Environment Institute, Stockholm, Jan. 2011; *idem.*, "Exposure and vulnerability to climate extremes: population and asset exposure to coastal flooding in Dar es Salaam, Tanzania", *Regional Environmental Change* 12 (2012): 81-94, here at 88.

<sup>11</sup> Kebede and Nicholls, "Population and Assets Exposure".

causes of flooding in the low-lying areas as being “climate change and sea-level rise”, among others. Much of their work, however, seems to project climate and the rise in sea level to become more calamitous in future than in the past and present. Hence, they call for a policy for making future interventions and for developing resilience. The geographer Graham Neil Sumner had revealed all the contour levels of the city in 1979.<sup>12</sup> A Tanzanian geologist, K A Msindai, noted in 2002 that the coastal plains of Dar es Salaam were geologically prone to salt corrosion, beach erosion, karstification and flooding. All the areas identified by Kebede and Nicholls fall within Msindai’s coastal plains.<sup>13</sup> Until the time of this research, the data produced by Sumner and Msindai had never been used to interpret flooding, nor had they been used by Kebede and Nicholls. Nor have the latter used the 1968 and 1979 master plan technical supplements which also presented a large part of the inhabited area as a coastal plain surrounded by a coastal plateau.<sup>14</sup> Moreover, Kebede and Nicholls present flooding events in Dar es Salaam as contemporary and future problems, which may influence readers to think that they never occurred regularly in the past.

The areas identified by Kebede and Nicholls as flood-prone areas have been identified by many social scientists and environmental engineers as flood-risk areas. Apart from Regina John, others are Robert Kiunsi and John Lupala from Ardhi University. These preceded John in recommending the development of resilient mechanisms for the people living in the flood zones.<sup>15</sup> Another is Markus Pleij whose study focused on the lowland of the River Msimbazi in the area around the Bus-Rapid Transit (BRT) terminal. Based at Delft University of Technology, Pleij sought to design the early flood warning system so that the BRT terminal and its users would take damage-preventive measures early to save property and lives.<sup>16</sup> The terminal has been constructed in the flood plain and has been facing flooding and silt deposition during the rainy season since its opening in 2015. According to Pleij, in the Msimbazi Valley lowland floods are caused by “degradation of the Msimbazi River system, the rapid and uncontrolled urban build-up, seawater level rise and increase of stormy weather.”<sup>17</sup> Like John, Kiunsi and Lupala, Pleij subscribes to the climate change and rise in sea level theories in explaining floods. He goes further by designing a

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<sup>12</sup> Graham Neil Sumner, “Storm Occurrence Over Dar es Salaam, Tanzania” (King’s College London, PhD thesis, 1979).

<sup>13</sup> K.A. Msindai, “Engineering Geological Mapping of Dar es Salaam City, Tanzania,” *Tanzania Journal of Science* 28, no. 2 (2002), 83-96.

<sup>14</sup> URT, *Dar es Salaam National Capital Master Plan: TS Physiography and Natural Resources* (Toronto: Project Planning Associates Limited, 1968).

<sup>15</sup> Robert B. Kiunsi and John Lupala et al., “Building Disaster-Resilient Communities: Dar es Salaam, Tanzania” in *Disaster Risk Reduction: Cases from Urban Africa* edited by Mark Pelling and Ben Wisner (London: Earthscan, 2009).

<sup>16</sup> Markus Pleij, “The design of an early warning system for floods in Dar es Salaam, Tanzania: A case study for the local bus company” (Delft University of Technology, MSc. Thesis, 2020).

<sup>17</sup> Pleij, “Early warning system of floods”, 1.

flood warning system, which implies he supports coping with or accepting flood risks as part of everyday life.



**Figure 8.1:** A Flooded Morogoro Road Section of the River Msimbazi in 1979

*Source: Mzalendo, 06.05.1979.*

The fact that all the above studies target the same areas and say that floods are caused by the recent climate change and/or the rise in sea level is interesting. Partly, it is interesting because their conclusions are the same in spite of the fact the researchers are from different academic disciplines and different countries, and use different methods. It is unfortunate that all the studies ignore the fact that the 1979 Dar es Salaam master plan had identified their study areas as hazardous — prone to floods because they are either river valleys, lowlands, water ways or marshlands. Recently, UNEP and a professor of urban planning at Ardhi University, Alphonse Kyessi, also agreed with the 1979 master plan conclusions on such areas.<sup>18</sup>

The rise in sea level and climatic change theories fail to explain not only the recent but also the historical flooding events in the areas that are far from river valleys as well as in most of the planned areas. One of the technical factors that explain why there is flooding in the streets of Dar es Salaam beyond the much-studied flood-risk areas is the increase in the size of the built-up area. In 2009, it was reported that about 50% of land in the city was occupied by “the single-storey low-rise house.”<sup>19</sup> The percentage was small because it was relative to the whole area in the city whose

<sup>18</sup> See “Mto Msimbazi Dar Kukarabatiwa Upya”, *Jambo Leo*, 11.09.2015

<sup>19</sup> Kiunsi and Lupala et al., “Building Disaster-Resilient Communities,” 129.



boundaries were expanded in 1974. In the colonial days when the city was smaller, the built-up area was probably above 80%. Having land which is heavily built reduces the surface area that would absorb surface water. The building of houses and roads makes the surface to be impervious. Although Kiunsi and Lupala did not associate flooding with loss of the perviousness of land as a result of road and house construction, they associated flooding with informal settlements.<sup>20</sup> Their argument was about the lack of drainage infrastructure and the establishment of settlements in hazardous areas. That may be interpreted as alluding that all formal settlements had drainage infrastructure and were not prone to floods. This study has uncovered that many planned settlements had been prone to floods since the colonial days.

Environmental engineering studies done in such African cities as Lagos in Nigeria indicate that there is a great a link between heightened flooding and the increase in the imperviousness of surfaces. Adebayo J Adeloje and Rabee Rustum contend that “the significant reduction in the pervious areas within the city [Lagos] has been the most important factor in the rising tendency for flooding.”<sup>21</sup> The more impervious an area becomes, the more the volume of surface runoff generated. In such circumstances, the surface runoff is generated instantly. The flood risk becomes very high, especially if the drainage lacks or is not functioning optimally owing to other factors like design or blockage. Understanding of the impervious factor can help to explain the occurrence of floods in colonial and post-colonial Dar es Salaam, especially in the most planned areas of the city which have been ignored by most studies. On the contrary, the tripartite relationship between impervious surface proliferation, flooding and building indicates that urban development should appropriate building technologies that are environment-friendly, technologies that would preserve a significant level of perviousness.

A study on Dar es Salaam floods by Tumpale Sakijege et al reveals that floods are mainly caused by encroachment on the river valley, housing densification, lack of storm-water drainage and haphazard dumping of solid waste in the few drains.<sup>22</sup> With the exception of lack of storm-water drainage, or rather, the absence of preparedness in the streets, the other factors are a recent past development and are the social outcomes of rapid and uncontrolled urbanisation. Housing densification and lack of drainage are urban governance and technological factors respectively. Densification is also highlighted in the findings of Adeloje and Rustum, who conducted a study in

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

<sup>21</sup> Adebayo J. Adeloje and Rabee Rustum, “Lagos (Nigeria) Flooding and Influence of Urban Planning,” *Urban Design and Planning* 164, no. DP3 (2010), 175-187, here at 183.

<sup>22</sup> Tumpale Sakijege et al., “Government and Community Involvement in Environmental Protection and Flood Risk Management: Lessons from Keko Machungwa, Dar es Salaam, Tanzania,” *Journal of Environmental Protection* 5 (2014), 760-771, here at 764.

Lagos which associates floods with the loss of pervious surfaces. Lack of drainage is supported by findings from the Global South cities in a study by Brian Reed.<sup>23</sup> These factors, therefore, relate to local conditions other than climate change. They are ideal factors in explaining flooding events in many parts of planned and unplanned areas of Dar es Salaam, areas whose floods are not examined in the studies which focus on climate change.

### **Towards a Flood Resilient Dar es Salaam: Making Use of the Past**

At the turn of the 21<sup>st</sup> century, the World Bank, UNDP and UN-Habitat worked closely with the government of Tanzania and the City Council to address the problem of flooding. The international agencies acted after learning that the master planning model was not working in Dar es Salaam for governance, financial and technical reasons. The agencies fund two main urban development projects and have helped to build the capacity of urban staff and to provide infrastructure. The two main development projects are the Sustainable Urban Development Programme (SUDP), implemented from 1992 to 2003<sup>24</sup>; and the Dar es Salaam Metropolitan Development Project (DMDP), which began in 2012.<sup>25</sup> Under the two projects, floods were addressed using surface and waste-water management. In the first project, flooding control was not given due attention, although floods were experienced during the rainy season. Knowledge of flood control was gained but technical practices maintained the business as usual mode as it was the case during the colonial and early post-colonial decades in Dar es Salaam. The two projects are empirical cases on how preparedness can be undertaken in urban areas of the Global South. This level of preparedness in drainage infrastructure might however be lacking in other infrastructures because the interdependence of infrastructure is taken for granted. For instance, water supply infrastructure is heavily dependent on electricity infrastructure for water processing and pumping. Yet, the water processing and pumping stations face frequent outages and lack a standby source of power. Water infrastructure is vulnerable because of the failure of power infrastructure, just as traffic is vulnerable because of inefficient drainage infrastructure (or lack thereof).

The largely successful control of flooding in the streets of the city happened after 2012 through the DMDP. Funded by the World Bank, the DMDP addressed the problems relating to the provision and improvement of infrastructure across the city. It led to the construction and repair of street roads from dirty to tarmac roads. Because of the even distribution of quality roads, there was improved street mobility as well as the dissipation of perception that good traffic

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<sup>23</sup> Brian Reed, "Storm-water management in low-income countries," *Municipal Engineer* 166, No. ME2 (2013), 111-120.

<sup>24</sup> UN-HABITAT, *The Sustainable Dar es Salaam Project 1992-2003: From urban environment priority issues to up-scaling strategies city-wide* (Nairobi: UN-HABITAT, 2004).

<sup>25</sup> Dar es Salaam Metropolitan Development Project retrieved from [www.dcc.go.tz](http://www.dcc.go.tz) on 19.02.2014.

infrastructure was only for the affluent streets, the CBD and highways. The newly-built roads have been equipped with roadside ditches, which are lined with concrete. The ditches are improving road drainage and protecting the roads against flood waters. The ditches are like those which were built during the colonial days in the Msimbazi and Gerezani creeks to control malaria, as discussed in Chapter III. The past lessons on improvement of drainage in the creeks and removal of storm water from the African streets a century ago have been appropriated to address the contemporary flooding challenges under the DMDP. The DMDP has also influenced the making of future resilient streets by making sure roads have drains.

As a matter of fact, it is inconceivable for road builders today to construct a road without drains. However, the roadside drains are not built to create an identifiable network comparable to the road network that run parallel to them. Some ditches direct their water to the nearby streams and valleys. Others are closed at both ends; thus, once water gets into the drains it is bound to stay longer, unless it dries up. The tendency to build drains that do not form a coordinated network was practised in colonial Dar es Salaam and is practised in other towns and cities in Africa, including Maiduguri in Nigeria.<sup>26</sup> In 2016, *Mwanahalisi* online paper carried a commentary on street drains that directed storm water to people's houses in Temeke District; the DMDP was asked to provide solutions in the near future.<sup>27</sup>

The DMDP has also encouraged controlling solid waste as well as dredging roadside ditches. The local authorities have hired casual labourers to routinely remove sand and other kinds of solid waste from the drains across the city. This has made storm water find passage in the drains, thus controlling flooding in the streets located away from the usual hazardous zones. In connection to flooding in the hazardous areas, the DMDP has overseen the improvement of drainage in the rivers and valleys in the city. In the lowland sections of seasonal rivers, dredging activities are done to remove sand and solid waste deposited in them by the water from the upper sections of the rivers. There is standby machinery for dredging in the Jangwani area, something that was unthinkable in the past. Through dredging, the DMDP has brought a culture of maintaining the rivers in Dar es Salaam. An ethnographic study on river maintenance and repair may shed more light on flood control. People's encroachment on river valleys and water ways is controlled by the city authorities to some extent. Moreover, in the districts of Temeke and Ubungo, the DMDP has led to the construction of seasonal rivers by widening them and building river banks and surfaces. This has improved drainage and created wider space for storm water. As a result, there has been a significant improvement in drainage in the adjacent streets, which used to be affected by floods.

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<sup>26</sup> Reed, "Storm-water management."

<sup>27</sup> See "Serikali, Benki ya Dunia kujenga miundombinu Temeke", *Mwanahalisi Online*, <http://mwanahalisionline.com/serikali-benki-ya-dunia-kujenga-miundombinu-temeke> accessed on 12.02.2016.

One such river is the River Ng'ombe, which passes through the streets of Ubungo, Sinza, Manzese and Tandale. The DMDP has, therefore, provided an understanding of technological interdependence between two kinds of infrastructure, traffic and drainage. It has provided a platform for demonstrating the importance of mitigating the possible damage to infrastructure by floods.<sup>28</sup>

The DMDP has yielded good results with respect to flood control in many streets in Dar es Salaam. It has established a high level of preparedness in the city for the current and future flooding events. The CBD, however, remains a difficult area in which to control floods. Although there are surface and open concrete-lined drains for storm water in the CBD, there are piped underground drains as well there. Some drains have clogged because of lack of maintenance and repair. Consequently, any little rain that falls causes floods on the roads. The drains were first installed by the Germans before the First World War and, later, expanded by British after the Second World War. Floods in the CBD are a stark reminder of the fact that technological solutions that work in the Global North might not be effective in the Global South. This justifies suggestions for technological appropriation to fit local conditions. Equally important, the northern areas of Mbweni, Ununuo, Boko, Tegeta, Kunduchi and Mbezi Beach are found close to the coastal escarpment. During the rainy season, the areas receive water from the escarpment, thereby making them prone to flooding. The situation is complicated further by lack of drains as well as a comprehensive settlement plan. Unplanned construction of houses reduced surface porosity and increased the volume of surface runoff. A comprehensive plan for drainage may be needed to reduce the effect of geography and human activities. This also applies to the CBD and several other areas in Dar es Salaam. The CBD and other planned areas where contemporary spatial planners and civil engineers may provide lasting solutions by drawing from a historical perspective.

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<sup>28</sup> See Stephanie Wakefield, "Infrastructures of Liberal Life: From Modernity and Progress to Resilience and Ruins," *Geography Compass* 12, no. 7 (2018), 1-14.

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## Appendices

### *Appendix A: Curriculum Vitae*

#### **CURRICULUM VITAE**

Frank Edward  
University Road, P.O. Box 35115  
Dar es Salaam 16103  
Tanzania.  
f38edward@yahoo.co.uk

#### **EDUCATION**

The Technical University of Darmstadt, Germany - October 2022

- PhD in History of Technology (*Magna cum Laude*)  
Thesis Topic: *Circulation and Appropriation of Urban Technologies: Drainage and Traffic Infrastructures in Dar es Salaam, 1913-1999.*

University of Dar es Salaam, Tanzania

- M.A. in History (GPA 5.0, Pass with Distinction) – Nov. 2013  
Relevant Coursework Modules: African thematic histories  
Dissertation Topic: *Health Implications of Witchcraft Beliefs and Practices in Uhebe: A Historical Perspective*
- B.A. in History and Archaeology (GPA 3.9, Upper Second-Class honors) – Nov. 2008  
Relevant Modules: African thematic history and archaeology

#### **EXPERIENCE**

June 2022 to October 2022: Research Associate in the ERC Global HoT Project, Institut für Geschichte, TU Darmstadt.

November 2018 to present: Assistant Editor of *Tanzania Zamani*, a journal of historical research and writing of University of Dar es Salaam and the Historical Association of Tanzania.

October 2018 – May 2022: Assistant Lecturer in History at University of Dar es Salaam. Taught Survey of World History of Science and Technology (Two-semester course); Health and Diseases in Modern African History; Population and Urban History of Tanzania; Africa and World Religions; Survey World History of Globalization.

October 2018 – November 2021: Examinations Officer of the Department of History, University of Dar es Salaam.

January – June 2018: Research Associate (Wissenschaftlicher Mitarbeiter) at the Section of Technological History, Institute of History, TU Darmstadt, Germany.

October 2016 – February 2017: Co-instructor at TU Darmstadt of the course titled “Sources of African History” with official no: 02-04-0430-ü

October 2013 – December 2014: University of Dar es Salaam, Assistant Lecturer in History

- I taught African and World Religions course, and African History of Health and Diseases courses for undergraduate students.

January – March 2011: Alkemist Media, Researcher

- Main researcher in the research for the making of Chief Mkwawa’s historical documentary in Tanzania

July – August 2010: Professor Jamie Monson, Research Assistant

- Research assistant in the historical project on Technology Transfer through TAZARA Railway in Iringa, Tanzani.

## CONFERENCES AND WORKSHOPS

- January 4-8, 2023: organised a conference on Technology and Material Culture in African History – Potentials and Challenges in Teaching and Research, Dar es Salaam, Tanzania.
- September 26 – October 2, 2022: Presented a paper on “Cycling as Mobility Crisis Escape in Socialist Tanzania” at INTRA Conference, University of Ghana, Accra, Ghana.
- November 18-21, 2021: Presented the paper titled “Swala Bicycles: A Hubris Account from Tanzania” at the virtual annual meeting of the Society for the History of Technology at New Orleans, Louisiana.
- November 1-3, 2018: Presented a paper at the Annual Meeting of the Historical Association of Tanzania. Title: “The Making of the Welfare State in Dar es Salaam”
- July 23-30, 2017: Presented a paper in 25<sup>th</sup> ICHST Conference held in Rio de Janeiro, Brazil. The paper title was: “Technology and Colonialism: Did the British Overrate their Technological Might in the Groundnut Scheme in Tanganyika, 1946-1961?”
- January 30-31, 2017: Participated in the Workshop on Teaching in English to Non-native Speakers organized by and conducted at TU Darmstadt, Darmstadt, Germany.
- December 1-3, 2016: Presented a paper in the 59<sup>th</sup> African Studies Association annual meeting held in Washington, D.C., USA. Title of the paper was: “Critiquing Postcoloniality? Towards an STS Perspective in African Urbanization”.
- June 22-25, 2016: Presented a paper in the Annual Meeting of the Society for History of Technology in Singapore titled “Drainage Infrastructures in Dar es Salaam, Tanzania, 1891-1960: When Technological Innovation and Health Intersect”.
- May 9-10, 2016: Presented a paper in Graz 2016 STS Annual Conference in Graz, Austria titled “Public Transport Infrastructures and Services in Dar es Salaam: Placing Users into Urban Transport Narratives?”
- March 30, 2016: Attended “The Worlds of Cult: Comparison of European and African Witchcraft Cults” at Queen Mary University of London, UK.
- December 14-16, 2015: Participated in “Mediation Theory and Philosophy of Technology” Workshop prepared by University of Twente, Netherlands.
- March 9-15, 2015: Participated in “Interdisciplinary PhD Training Week in Dar es Salaam, Tanzania” organized by TU Berlin, TU Darmstadt, Ardhi University and University of Dar es Salaam.

## PUBLICATIONS

- “Planned Vulnerabilities? Street Flooding and Drainage Infrastructure in Colonial Dar es Salaam” in *HoST* 16 (1) (June 2022): 29-47.
- Book review: “Cholera: The Victorian Plague by Amanda J. Thomas” in *Tanzania Zamani* 13 (2) (2021), 181-185.
- Book review: “Liberation and Technology: Development Possibilities in Pursuing Technological Autonomy by Gussai Sheikheldin” in *Tanzania Zamani* 12 (2) (2020), 181-186.
- with Mikael Hård, “Maintaining the Local Empire: The Public Works Department in Dar es Salaam, 1920–60” in *The Journal of Transport History* 41 (1) (2020), 27-46. DOI: 10.1177/0022526619883457
- with Bettina Brockmeyer & Holger Stöcker, “The Mkwawa Complex: A Tanzanian-European History about Provenance, Restitution, and Politics”, in *Journal of Modern European History* 18 (2) (2020), 117-139. DOI: 10.1177/1611894420909033
- Book review: “Amy S. Patterson, Africa and Global Health Governance: Domestic Politics and International Structures by Amy S. Patterson”, in *Medical History* 63 (2) (2019), 242-244. DOI: 10.1017/mdh.2019.22

- Book review: “What Do Science, Technology, and Innovation Mean from Africa? ed. by Clapperton Chakanetsa Mavhunga”, in *Technology and Culture* 59 (3) (2018), 815-816. DOI: 10.1353/tech.2018.0083
- Book review: “Aspects of Colonial Tanzania History by Lawrence E.Y. Mbogoni”, in *Tanzania Zamani* IX (2) (2017), 174-178.
- Book review: Casper Andersen, *British Engineers and Africa, 1875-1914*. London: Pickering and Chatto, 2011. *African Studies Review* 59 (3) (December 2016), 253-254.
- “Health Implications of Witchcraft Beliefs and Practices in Uhehe: A Historical Perspective”. Dar es Salaam: University of Dar es Salaam, 2013.

## **AWARDS**

- June 2017: Awarded ICOHTEC Travel Grant to attend the 25<sup>th</sup> ICHST Conference in Rio de Janeiro, Brazil, July 23-29, 2017.
- November 2016: Awarded HBS Travel Grant to attend the 59<sup>th</sup> Annual Meeting of the African Studies Association in Washington, D.C., USA, Dec.1-3, 2016.
- April 2016: Awarded Travel Grant to attend the SHOT Annual Meeting in Singapore 22-25 June, 2016 by the Society for the History of Technology.
- February, 2016: Awarded IPD4all Research Grant by the Graduate School for Urban Studies at TU Darmstadt for a Two-week Archival Research in London, UK.
- December, 2014: Awarded Hans-Böckler Stiftung stipend scholarship for PhD studies at Darmstadt University of Technology, Germany, from January 2015 to December 2017.
- February, 2009: Awarded GeSoMo GEGA-NUFU Scholarship for M.A. History at University of Dar es Salaam, Tanzania.

## **RESEARCH INTERESTS**

- Historical and social studies of urbanization, science and technology.

## **SKILLS**

- Language skills: written and spoken English, Swahili and Hehe languages.
- Teaching skills
- Historical research skills

## **Society Membership**

- The Society for the History of Technology (SHOT)
- Historical Association of Tanzania (HAT)

