



Investing in Tomorrow's Labour Force

Socioeconomic implications of the
demographic transition in Zanzibar



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*Investing in Tomorrow's Labour Force:
Socioeconomic implications of the demographic
transition in Zanzibar*

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Contents



Figures	3
Tables	5
Boxes	5
Abbreviations and acronyms	6
Foreword	7
Executive summary	8
Introduction	17
The demographic transition	19
1.1 What is it and how can it benefit countries?	20
1.2 The stages of the demographic transition	20
1.3 How does the demographic transition have an impact on the future of children and adolescents?	22
1.4 Zanzibar's demographic situation: now and in the future	23
Methodology	29
2.1 The trajectories and underlying sectoral analyses	30
2.2 Limitations	33
Results	37
3.1 The status-quo trajectory: high population growth with low level of public investment	39
3.1.1 Population projections	39
3.1.2 Education	43
3.1.3 Health	47
3.1.4 Infrastructure	51
3.1.5 Social development	54

3.2	The most-favourable trajectory: low population growth with high public investment	56
3.2.1	Population projections	57
3.2.2	Education	59
3.2.3	Health	61
3.2.4	Infrastructure	65
3.2.5	Social development	67

Discussion and recommendations 69

4.1	Discussion	70
4.1.1	Education	70
4.1.2	Health	71
4.1.3	Infrastructure	72
4.1.4	Social development	73
4.1.5	Combined results	74
4.2	Recommendations	75
4.2.1	Generate sustainable financing mechanisms	75
4.2.2	Invest in more and better-qualified public staff, especially in the education and health sectors	76
4.2.3	Universalize the access to electricity, water and sanitation infrastructure	76
4.2.4	Generate more and better formal labour market opportunities	77

Bibliography 79

Appendices

Appendix 1–4 referred to in this publication can be found online at <https://www.unicef.org/tanzania/>

Figures

Figure 1: Summary results per sector, scenario and level of public investment (2021–2060)	10
Figure 2: The stages of the demographic transition	21
Figure 3: Total fertility rate across time	23
Figure 4: Zanzibar’s demographic transition	24
Figure 5: Population pyramids for Zanzibar for 1988, 2021, 2030 and 2060	25
Figure 6: Annual population growth rate, 2005–2020	25
Figure 7: The window of opportunity – age-disaggregated population (%)	26
Figure 8: Modelled scenarios and levels of public investment	30
Figure 9: Example of rising government investment in education under the low-public-investment choice	30
Figure 10: Zanzibar’s total projected population and annual projected population growth rate under the high population growth scenario	39
Figure 11: Zanzibar’s total rural and urban population projected under the high population growth scenario	39
Figure 12: Summary results per sector, scenario and level of public investment (2021–2060)	40
Figure 13: Total projected population by age-group for the high population growth scenario	43
Figure 14: Projected dependency ratio for the high population growth scenario	43
Figure 15: The projections of school-age children, by educational level for the high population growth scenario	44
Figure 16: Gross public enrolment rates by education level for the high population growth scenario	45
Figure 17: Total number of public teachers by education level for the high population growth scenario	45
Figure 18: Total number of classrooms by education level for the high population growth scenario	46
Figure 19: Projected nominal and real education budget, in absolute terms and as a percentage of GDP and government expenditure under the status-quo trajectory	47
Figure 20: Total number of medical staff and public hospital beds required under the status-quo trajectory	49
Figure 21: Total number of primary, secondary and tertiary health facilities required under the status-quo trajectory	49
Figure 22: Projected nominal and real overall health budget, in absolute terms and as a percentage of GDP and government expenditure under the status-quo trajectory	50
Figure 23: Projected nominal and real health budget for essential services, in absolute terms and as a percentage of GDP and government expenditure under the status-quo trajectory	50
Figure 24: Projections in health outcomes under the status-quo trajectory	51

Figure 25: The real costs of improved electricity, water and sanitation extension to urban areas under the status-quo trajectory (2020/21 prices)	53
Figure 26: The real costs of improved electricity, water and sanitation extension to rural areas under the status-quo trajectory (2020/21 prices)	53
Figure 27: Projected nominal and real infrastructure budget, in absolute terms and as a percentage of GDP and government expenditure under the status-quo trajectory	54
Figure 28: Projected poverty rate and the number of poor individuals under the status-quo trajectory	56
Figure 29: Zanzibar's total projected population and annual projected population growth in the low population growth scenario	57
Figure 30: Zanzibar's total rural and urban population projected in the low population growth scenario	57
Figure 31: Total projected population by age-group under the low population growth scenario	58
Figure 32: Projected dependency ratio, by population growth scenario	59
Figure 33: Projected nominal and real education budget, in absolute terms and as a percentage of GDP and government expenditure under the most-favourable trajectory	61
Figure 34: Total real education budget in US\$ by trajectory (in 2020/21 prices)	61
Figure 35: Projected nominal and real overall health-care budget, in absolute terms and as a percentage of GDP and government expenditure under the most-favourable trajectory	63
Figure 36: Projected nominal and real health-care budget on essential services, in absolute terms and as a percentage of GDP and government expenditure under the most-favourable trajectory	63
Figure 37: Total real overall health-care budget in US\$ by trajectory (in 2020/21 prices)	64
Figure 38: Projections in health outcomes under the most-favourable trajectory	64
Figure 39: Projected nominal and real infrastructure budget, in absolute terms and as a percentage of GDP and government expenditure under the most-favourable trajectory	66
Figure 40: Total real overall infrastructure budget in US\$ by trajectory (in 2020/21 prices)	66

Tables

Table 1:	Key assumptions of each population growth scenario	32
Table 2:	Sectoral indicators and their targets across time	34
Table 3:	Projected age proportion of population for the high population growth scenario	42
Table 4:	Health indicators for Zanzibar	48
Table 5:	Urban and rural populations with access to electricity, water and sanitation under the status-quo trajectory, 2021–2060	52
Table 6:	The total employed and unemployed in thousands under the status-quo trajectory	55
Table 7:	Projected age proportion of population in the low population growth scenario and its difference to the high population growth scenario	58
Table 8:	Projected number of teachers, classrooms and schools by education level under the most-favourable trajectory	60
Table 9:	Changes in the number of medical staff, public hospital beds and public health facilities under the most-favourable trajectory	62
Table 10:	Urban and rural populations with access to electricity, water and sanitation under the most-favourable trajectory	65
Table 11:	GDP per capita, poverty rates and numbers of poor individuals per trajectory	67

Boxes

Box 1:	Terminology	18
Box 2:	A sectoral snapshot	27
Box 3:	The assumptions underlying the population growth scenarios	32
Box 4:	Zanzibar's Development Vision 2050	68

Abbreviations and acronyms

DemDiv	demographic dividend
GDP	gross domestic product
ICT	information and communication technology
ILO	International Labour Organization
MoEVT	Ministry of Education and Vocational Training
MoH	Ministry of Health
MoHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MoLYWCD	Ministry of Labour, Youth, Women and Child Development
NBS	National Bureau of Statistics
OCGS	Office of the Chief Government Statistician
OECD	Organization of Economic Cooperation and Development
PACE	Policy, Advocacy, and Communication Enhanced for Population and Reproductive Health
RGoZ	Revolutionary Government of Zanzibar
SDGs	Sustainable Development Goals
TSh	Tanzania shilling
UNDESA	United Nations Department of Economics and Social Affairs
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNICEF	United Nations Children's Fund
WEF	World Economic Forum
WHO	World Health Organization
USAID	United States Agency for International Development
US\$	United States dollar
ZAWA	Zanzibar Water Authority
ZECO	Zanzibar Electricity Corporation
ZEDP II	Zanzibar Education Development Plan II 2017–2022
ZURA	Zanzibar Utilities Regulatory Authority

Foreword

With a view to reaping the full benefits of the demographic transition and meeting its goal of becoming an upper-middle-income country by 2050, the Revolutionary Government of Zanzibar (RGoZ) will be required to make significant public investments in the education, health, infrastructure and social development sectors. This will entail ensuring that all citizens, especially children, have access to quality public services, as envisioned in the Sustainable Development Goals (SDGs) and those set by Zanzibar's Development Vision 2050.

To determine just how much investment would be required to meet these targets, the Office of the Chief Government Statistician (OCGS) and the Zanzibar Planning Commission (ZPC), with support from UNICEF Tanzania, commissioned this assessment – *Investing in Tomorrow's Labour Force: Socioeconomic implications of the demographic transition in Zanzibar*. With support from the Economic Policy Research Institute, in-depth analyses were conducted by sector, drawing on comprehensive qualitative and quantitative data.

The assessment juxtaposes public investment required to retain current levels of progress in social sectors vis-à-vis the attainment of nationally identified goals in education, health, infrastructure

and social development for two established population growth scenarios. In doing so, it illustrates key challenges and emerging opportunities to promote inclusive growth and economic transformation by investing in Zanzibar's growing child population and its future transition to the labour market.

As such, our most sincere hope is that this assessment will serve as part of an evidence base to inform policy design and programme implementation with a view to providing quality, inclusive and equitable health-care and education services for all; to provide everyone, in both rural and urban areas, with access to electricity as well as improved water and sanitation services; and to create decent employment opportunities for Zanzibar's growing youth population. In anticipation of updating the analysis with the 2022 Population and Housing Census (PHC) data, the RGoZ and UNICEF will continue to work with development partners, civil society organizations and the private sector to improve these sectoral outcomes, thereby ensuring that each and every child is supported to reach her/his full potential and positively contribute Zanzibar's socioeconomic transformation.



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Executive summary

1. Introduction

Young and fast-growing populations as a result of high fertility rates can be witnessed in many African countries. Yet, given underlying economic and social improvements, this trend is slowly changing. With falling fertility rates, many countries are presented with an opportunity for economic growth as the size of the working-age population becomes increasingly larger than the dependent population – those aged 0–17 years, and 65 years and above. The extent of the projected growth, however, is highly context specific, and is influenced by factors such as the age structure of the population, the make-up of the country's economic output and labour market, as well as the nation's level of socioeconomic development.

This opportunity for growth is also present for Zanzibar, yet given the country's relatively young population, strategic shifts in public investment choices hold unprecedented potential to foster a healthy, well-nourished, well-educated, and empowered child/youth population while also creating opportunities for decent employment.

This assessment aims to develop a comprehensive analysis of the implications that the demographic transition, as well as the status of service delivery and its associated public investments have on the journey of children and adolescents to adulthood. The assessment provides unique insight to help Zanzibar reap the full benefit of the demographic transition.

2. Demographic context and trends in Zanzibar

During the past 15 years, Zanzibar has witnessed a population growth rate that has remained at or above the average rate in sub-Saharan Africa. With an

annual growth rate of 2.7 per cent in 1967 increasing to one of 3.3 per cent in 2021, Zanzibar's population grew from a total of 354,815 to approximately 1.7 million (NBS, 2006; NBS and OCGS, 2013). In addition, changes in mortality and fertility have affected the country's population growth rate, leading to significant changes in Zanzibar's age structure. While total fertility per woman fell from 7.3 children in 1967 to 4.5 children in 2017, mortality more than halved from 10.1 deaths per 1,000 persons in 2000 to 4.3 deaths in 2020 (NBS and OCGS, 2018). These factors have led to a rise in life expectancy as well as a reduction in infant and child mortality.

From 2002 to 2020, life expectancy at birth rose from 50.9 years to 68 years, with further increases expected over the coming 15 years, allowing for life expectancy to reach 73.2 years by 2035. Simultaneously, Zanzibar will witness a decline in its infant mortality rate from 38.4 infant deaths per 1,000 live births in 2013 to 12.5 deaths per 1,000 live births in 2035 (NBS and OCGS, 2018). As a result of fewer births, Zanzibar's child (0–17 years) and youth (18–24 years) population has decreased as a percentage of the total population, while the proportion of its working-age population (18–64 years) is expanding, thereby decreasing the country's overall dependency ratio. This demographic transition will continue to be evident in the future with the proportion of children as a share of the total population declining from approximately 48.8 per cent in 2020 to 28.1 per cent in 2060. In contrast, the share of the working-age population (aged 18 to 64) will increase from 48.5 per cent in 2020 to 62.4 per cent in 2060. With this increase, the overall dependency ratio of Zanzibar will decline from a level of 106.3 in 2020 to 60.4 in 2060.¹

Consequently, it will become increasingly important for Zanzibar to absorb the growing working-age population into the national labour market – especially given that Zanzibar enters its window

1 Author's own projections based on underlying assumptions retrieved from the National Population Projections report (NBS and OCGS, 2018).

of opportunity in 2023.² Taking advantage of this opportunity could be hindered by the high rates of un- and underemployment in the country, especially among the youth. Almost one in five individuals is unemployed, with the number rising to one in three among the youth. In addition to this, the creation of employment has only risen marginally since 2000, resulting in many individuals looking for work in the informal sector. In 2021, 41.7 per cent of those in total employment were in the informal sector, the majority of whom were women. This is detrimental to Zanzibar's development, as the informal sector is composed of micro and small-scale businesses and low-skilled employment, which are largely situated in rural agriculture, fishing, and urban retail sectors (NBS and OCGS, 2018). Combined with low wages and a relatively high level of underemployment, especially among the youth, little added value is created.

These factors offer an opportunity to achieve better results for children and adolescents through targeted public investment. The human capital that remains unemployed could significantly contribute to the Zanzibari economy if adequate formal sector employment in the productive sectors of the country is created.

3. Methodology

The assessment uses a combination of qualitative and quantitative data collection and analysis methods. Qualitative information was based on secondary data obtained through structured desk research, consultations and key informant interviews, while quantitative information was based on an adapted methodology used previously by the World Bank (World Bank, 2020). Overall, the adapted methodology quantifies the challenges and opportunities that Zanzibar has as it moves through its demographic transition. This includes, more specifically, the transition's impact on service delivery and fiscal space in the education, health, infrastructure and social development sectors.

Four respective sub-models were devised for the analysis. Each sub-model quantifies the

impact of Zanzibar's demographic transition across two population growth scenarios – one where population growth resembles the most likely path that the country will take in the future, and another in which the Revolutionary Government of Zanzibar (RGoZ) makes deliberate choices to reduce the future population growth rate in the country. Each of these two scenarios assumed an interplay with two possible levels of public investment, i.e., a low level of public investment and a high level of public investment, respectively.

A low level of public investment models the implications of population growth, assuming that the current (2021) access and quality of identified components within the sector remain constant over time. In other words, this public investment level presents how much a government would need to invest to finance the system if the current levels of sectoral indicators were to be maintained between 2021 and 2060 in light of a rising population. A high level of public investment models the implications for government given a gradual improvement in key sector parameters that are related to access and quality. These are in line with targets set by international guidelines, the Zanzibar Development Vision 2050, as well as corresponding sectoral strategies (MoEVT, n.d.; MoH, 2013; RGoZ, n.d.; ZURA, 2017).

4. Findings

Results are modelled for both constant and reduced population growth scenarios and for low and high levels of public investment for each of the four sectors. While the education, health and infrastructure sub-models provide an overview of the required investments by population growth scenario and public investment level, the social development model identifies the respective impacts on gross domestic product (GDP) per capita and on poverty. For a summary overview of these findings per population growth scenario and public investment levels, see Figure 1.

² This is defined as a period where Zanzibar's age structure has changed advantageously, thereby favouring economic development.

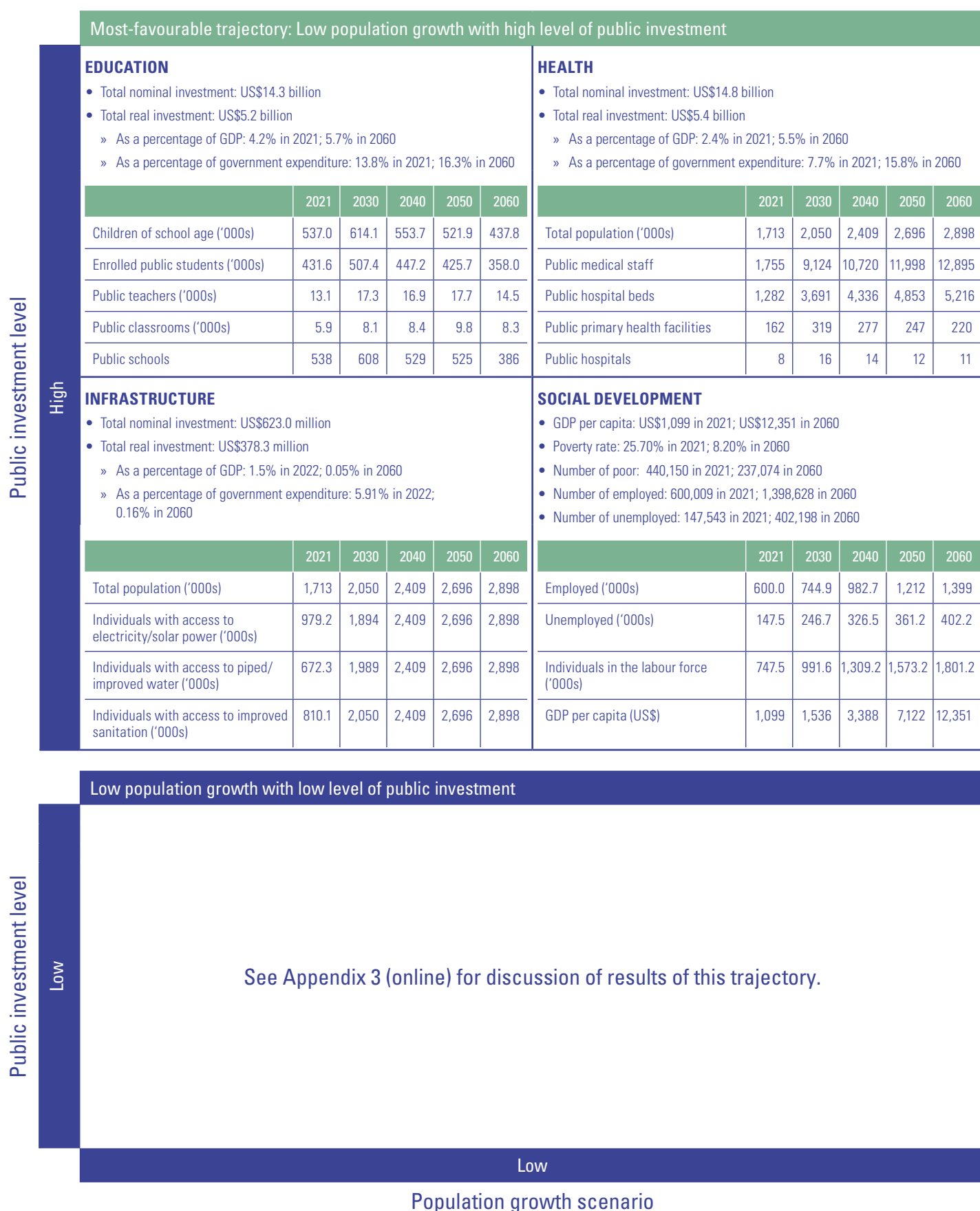


Figure 1: Summary results per sector, scenario and level of public investment (2021–2060)

Source: Author, based on author's calculations.

Note: Nominal values refer to the current value of the investment without taking inflation into account. Real values refer to the nominal value of the investment, yet is adjusted for inflation over time.

High population growth with high level of public investment

Public investment level

High

See Appendix 3 (online) for discussion of results of this trajectory.

Status-quo trajectory: High population growth with low level of public investment

Public investment level

Low

EDUCATION

- Total nominal investment: US\$7.0 billion
- Total real investment: US\$2.7 billion
 - » As a percentage of GDP: 4.2% in 2021; 2.5% in 2060
 - » As a percentage of government expenditure: 13.8% in 2021; 7.3% in 2060

	2021	2030	2040	2050	2060
Children of school age ('000s)	537.0	648.6	652.1	661.5	632.4
Enrolled public students ('000s)	431.6	536.2	536.0	545.5	521.0
Public teachers ('000s)	13.1	16.4	16.4	16.7	16.1
Public classrooms ('000s)	5.9	7.3	7.3	7.5	7.2
Public schools	538	674	673	687	659

HEALTH

- Total nominal investment: US\$2.9 billion
- Total real investment: US\$1.2 billion
 - » As a percentage of GDP: 2.4% in 2021; 0.9% in 2060
 - » As a percentage of government expenditure: 7.7% in 2021; 2.7% in 2060

	2021	2030	2040	2050	2060
Total population ('000s)	1,713	2,116	2,570	2,997	3,378
Public medical staff	1,755	2,169	2,634	3,071	3,462
Public hospital beds	1,282	1,642	1,994	2,325	2,621
Public primary health facilities	162	207	252	294	331
Public hospitals	8	10	12	15	16

INFRASTRUCTURE

- Total nominal investment: US\$348.0 million
- Total real investment: US\$162.6 million
 - » As a percentage of GDP: 0.35% in 2022; 0.07% in 2060
 - » As a percentage of government expenditure: 1.39% in 2022; 0.19% in 2060

	2021	2030	2040	2050	2060
Total population ('000s)	1,713	2,116	2,570	2,997	3,378
Individuals with access to electricity/solar power ('000s)	979.2	1,227	1,512	1,789	2,045
Individuals with access to piped/improved water ('000s)	672.3	856.9	1,074	1,294	1,502
Individuals with access to improved sanitation ('000s)	810.1	1,013	1,245	1,470	1,677

SOCIAL DEVELOPMENT

- GDP per capita: US\$1,099 in 2021; US\$4,976 in 2060
- Poverty rate: 25.70% in 2021; 12.76% in 2060
- Number of poor: 440,150 in 2021; 431,079 in 2060
- Number of employed: 600,009 in 2021; 1,320,830 in 2060
- Number of unemployed: 147,543 in 2021; 649,250 in 2060

	2021	2030	2040	2050	2060
Employed ('000s)	600.0	737.1	927.7	1,123	1,321
Unemployed ('000s)	147.5	254.6	402.0	532.2	649.3
Individuals in the labour force ('000s)	747.5	991.7	1,329	1,655	1,970
GDP per capita (US\$)	1,099	1,397	2,044	3,150	4,976

High

Population growth scenario



The results illustrated in Figure 1 indicate that the RGoZ will benefit most, both economically and socially, by implementing policies that allow for the improvement in the underlying sectoral indicators as well as the reduction of the country's total fertility rate over time. This would be the most-favourable trajectory for Zanzibar. Although the costs would be greater than those for maintaining the status quo, Zanzibar will be able to reap the economic benefits of the demographic transition, i.e., higher economic growth rates due to increased productivity, thereby leading to lower future fiscal implications and achieving its target of becoming an upper-middle-income country by 2050. This will require the government to invest a total of US\$14.3 billion nominally (US\$5.2 billion in 2020/21 prices) into education, at least US\$14.8 billion (US\$5.4 billion in 2020/21 prices) into health, and a total of US\$623 million (US\$378.3 million in 2020/21 prices) into the country's electricity, water and sanitation infrastructure. The implications of the investments under the most-favourable trajectory are presented in the following sub-sections.

4.1 Education

Consequently, the investments into education will allow the government to achieve the Education 2030 Framework for Action as evidenced by an

education budget that equates to 4.2 per cent of GDP and 15.1 per cent of government expenditure by 2030, and 5.7 per cent of GDP and 16.3 per cent of government expenditure by 2060. This will improve the country's student-to-teacher and student-to-classroom ratios to levels commensurate with international and national policy targets, while also allowing construction of additional and larger schools. These developments would require an additional 4,631 teachers to be hired by 2050, and an additional 132 schools to be built – all of which would be triple in size compared to those built today.

Education is paramount to improving key sectoral outcomes. The successful transition from primary to secondary education is of great importance, especially for girls. This, as well as an increase in the prevalence of modern contraceptive methods, helps delay marriage and first pregnancies. Furthermore, women with higher levels of education are more likely to participate in the wage-earning labour force, and are more likely to have smaller families. Further lowering of birth rates contributes to changes in the age structure, which over time increases the opportunity for children and youth, especially women, to contribute to the Zanzibari economy, thereby enhancing the potential for economic development.

4.2 Health

Through an increased investment in health, Zanzibar will achieve the Abuja Declaration target of allocating at least 15 per cent of the government budget towards health, thereby also transforming its health sector to one that has a Universal Health Coverage Index of 90 per cent – up from the present 43 per cent. This will result in better servicing of the growing and aging population over time given that the investments will allow for the construction of an additional 157 public primary health facilities, and eight public secondary and tertiary facilities, as well as the improvement of the medical-workers-to-population ratio in line with international standards.

Major improvements in key health outcomes are projected to occur in the coming four decades. From 2021 to 2060, neonatal mortality is projected to decline by 26 deaths per 1,000 live births; infant mortality by 31 deaths per 1,000 live births; under-five mortality by 55 deaths per 1,000 live births; and maternal mortality by 92 deaths per 100,000 live births. As a result, these mortality rates would equate to 3, 16, 12 and 215, by 2060, respectively. These improvements are paramount to Zanzibar's economic growth as, in addition to social and emotional costs, the death of a mother carries with it not only significant socioeconomic development loss in terms of contribution to the economy but also towards the raising of potentially healthy and educated children.

4.3 Infrastructure

Infrastructure has been a priority for the government since the revolution, yet universal access to electricity, water and sanitation is still a challenge. While 80.5 per cent of the urban population had access to electricity/solar power in 2021, only 38.4 per cent of the rural population did. In terms of access to piped/improved water, these percentages equate to 75.4 per cent and 10.2 per cent respectively, while access to improved sanitation was available for 63.7 per cent of the urban and 34.1 per cent of the rural populations.³

³ Author's calculations based on the 2019/20 Household Budget Survey and the 2015/2016 Demographic and Health Survey.

To attain and maintain universality of access to electricity, water and sanitation, results illustrate that the government will need to invest, on average, US\$27.1 million annually from 2022 to 2030, and US\$4.5 million annually thereafter (in 2020/21 prices). This equates to a total real investment of US\$62.9 million in electricity, US\$105.8 million in water, and US\$209.6 million in sanitation from 2021 to 2060 – equivalent to, on average, 0.42 per cent of annual GDP and 1.52 per cent of annual government expenditure. Compared to maintaining access rates at present levels, these improvements in access and quality will lead to roughly 2.3 times the costs across the 39-year period. Yet these are required to ensure a healthy and productive economy, as without electricity, water and sanitation, industries face difficulties operating, and the spread of disease becomes a danger. This not only influences the income of individuals but also their long-term productivity, thereby having an impact on sustained economic growth.

4.4 Social development

Another main challenge that the government will face over the coming four decades is to ensure that the growing working-age population, especially the youth, will have access to decent and productive labour market opportunities. These are important to reduce the relatively high level of unemployment and increase the labour force participation rate, especially that of women and youth. Policies are required that

To attain and maintain universality of access to electricity, water and sanitation, results illustrate that the government will need to invest, on average, US\$27.1 million from 2022 to 2030, and US\$10.8 million annually thereafter.





reduce the level of informality while improving labour market flexibility, financial market efficiency and the effectiveness of public institutions.⁴ These would collectively allow the government to reap significant benefits in terms of GDP per capita and economic growth if combined with the improvements in the aforementioned sectors.

In fact, according to the results, an improvement in labour market flexibility, financial market efficiency and the effectiveness of public institutions to the level exhibited by African upper-middle-income countries would allow Zanzibar to attain upper-middle-income status by 2043 – seven years ahead of the intended target. Anything less than this would hinder the attainment of this national target. By reaching these objectives, the government will decrease the number of unemployed by approximately 27.0 per cent in 2060 compared to the current status quo. This lower

level of unemployment implies that more working-age individuals will be productively contributing to the Zanzibari economy. As a result, GDP per capita will increase from a level of US\$1,099 in 2021 to US\$12,351 in 2060 – the latter would be US\$6,643 higher should no improvements to the current labour market be experienced.

Yet these are not the only benefits that the government will reap. By increasing labour market opportunities and thereby improving the standard of living for Zanzibaris, the government will also contribute to reducing the level of poverty. While 25.7 per cent of the population was poor in 2021, this will decline to 8.2 per cent in 2060 on the condition that Zanzibar implements policies that allow it to attain upper-middle-income status. In terms of the number of poor, this decline will equate to a reduction of close to 203,100 individuals in the coming four decades.

4 These can take many forms: “Robust legal frameworks and representative parliaments with strong capacity for oversight; adept civil services and the timely and quality delivery of public services; efficient judiciaries that uphold the rule of law; vibrant and actively engaged civil societies; and free and independent media.” (OECD, 2015).

5. Conclusion

To achieve the results outlined above, it must be emphasized that the RGoZ needs to concurrently invest in and improve existing policies in education, health, infrastructure and social development in order to establish a socioeconomic environment that is conducive to growth. By raising sectoral expenditure and permitting cross-sectoral synergies, Zanzibar can maximize the level of education attained by each child, reduce neonatal, infant, under-five and maternal mortality rates to levels closer to, or on a par with, the targets identified under the Sustainable Development Goals (SDGs), and consequently improve life expectancy.

Furthermore, through the implementation of policies that formalize the economy and generate jobs, the government can achieve the transition of children born in a period of high fertility into the labour market. In combination with high-quality education and health care for all, these children can become productive members of society – allowing them to earn higher wages and save money. This, along with a decreased financial burden (given government investment in education and health as well as a decline in family size due to fewer births), will allow individuals to undertake more personal and business-related investments. Such investments, in combination with an increase in national savings, will in turn fuel economic growth and lead to an increase in Zanzibar's GDP per capita.

To achieve this, the government will need to invest a total nominal amount of roughly US\$30 billion over the coming four decades, i.e., approximately US\$11 billion in real terms (2020/21 prices). This is roughly US\$16 billion more, in nominal terms, compared to a situation in which the government continues to spend the same amount as was spent in 2021 for the coming 39 years. If disaggregated by year, the average annual total investment would equal US\$282.1 million in 2020/21 prices – double the amount of what was spent on the sectors in 2021. Disaggregated by sector, the total real investment across the 39 years equates to US\$5.2 billion for education, US\$5.4 billion for health care, and roughly US\$378.3 million for an expansion in infrastructure. It must be emphasized, however, that these are, at best, conservative estimates of what is in store for Zanzibar.

6. Recommendations

To conclude, this assessment presents four main recommendations based on the findings outlined throughout the report. They focus on enabling a better transition from childhood to adolescence, focusing specifically on improving the quality and access of individuals to education, health, infrastructure, as well as to labour market opportunities.

6.1 Generate sustainable financing mechanisms

To achieve sustainable and equitable education, health, infrastructure and social protection services, it is vital not only to understand how public expenditure is allocated and used across the sectors, but also how to assess the efficiency, effectiveness, equity and adequacy of such expenditure. To do so, the RGoZ can introduce or strengthen various public financial management analysis tools. These include:

- The reintroduction of public expenditure reviews per sector;
- The introduction of a public expenditure tracking survey; and
- The regular production of budget briefs for each sector.

Additionally, the government can foster sustainable tax revenues that can subsequently be allocated towards education, health, electricity, water, sanitation and social protection by:

- Building trust among its citizens by providing them with transparency in terms of government spending;
- Expanding the tax base, yet keeping the system simple; and
- Introducing a digital tax payment system once a comprehensive information and communication technology (ICT) infrastructure has been developed in the country.

In addition to enhancing the country's financial reach and coverage, it is also of importance to consider introducing innovative financing mechanisms such as micro-contributions, taxes, public-private partnerships and market-based financial transactions, providing they do not unduly burden the country. Finally, the country should continue to strengthen its efforts to fight corruption.

6.2 Invest in more and better-qualified public staff, especially in the education and health sectors

With the increase of public revenue, the RGoZ will need to ensure that sufficient qualified public staff are present in all public education and health facilities. This can occur across a number of avenues:

- The development of improved and transparent recruitment strategies and systems;
- The adjustment of wages in line with annual real wage growth rates in addition to the provision of incentives to individuals employed in remote areas;
- The development of specific rules and regulations to monitor public staff in the education and health sectors;
- The conducting of a rapid assessment of education and health staffing needs across the country; and
- The development of digital opportunities to foster regular training of staff, where applicable.

6.3 Universalize the access to electricity, water and sanitation infrastructure

With an increasing population over time, the RGoZ will need to ensure that universal access to electricity is present for all, given that this is considered to be a basic human right. This can be achieved by:

- Creating new or strengthening existing policy frameworks designed for each sector;
- Ensuring the enforcement of the 2015 Public–Private Partnership Act so that public utility institutions can partner with the private sector to identify and develop alternative technologies; and

- Strengthening the capacities of the institutions and authorities involved, such as the staff of the Zanzibar Electricity Corporation (ZECO), the Zanzibar Utilities Regulatory Authority (ZURA), and the Zanzibar Water Authority (ZAWA).

6.4 Generate more and better formal labour market opportunities

It is recommended that the RGoZ builds a more inclusive labour market that provides more and better formal employment opportunities, especially for youth and women. This requires a multipronged approach ranging from reforming the education and training curricula to reduce the mismatch of labour supply and demand, to implementing interventions and policies that address the need for gender equality and access to employment opportunities by the youth. The RGoZ is encouraged to:

- Revisit and update national policy documents related to employment opportunities for the youth to ensure that the priorities and opportunities for youth employment remain relevant and up to date;
- Structurally reform the labour market, while ensuring adequate social investments are undertaken in key sectors to avoid the mismatch of labour demand and supply; and
- Introduce campaigns, programmes and incentives to foster the employment of youth and women.

The above points must be devised in such a way that they are geared towards the productive industries in Zanzibar – the ones that generate value addition to the economy and capitalize on the linkages between tourism, agriculture and trade. According to Zanzibar's Development Vision 2050, these industries include the commercialization of cloves, fisheries, oils, seaweed and dairy; the extension of the ICT network; and the export of salt, jewellery, wooden products, electronics and handicrafts. These are of importance if the government would like to attain its goal of reducing the share of individuals employed in agriculture, while increasing the relevance of industrialization and trade development.



With an increasing population over time, the RGoZ will need to ensure that universal access to electricity is present for all.

Introduction

High fertility rates coupled with lower mortality rates among children have led to young and fast-growing populations in many African countries. In the absence of targeted economic and social investment, especially in the areas of health and education, the growing youth will have few opportunities to enter the national labour markets, thereby inhibiting them from adding value to the economy. This does not only adversely impact economic growth, but also reduces the opportunities of individuals, especially youth, and the human capital developed over the long run.

In 2021, this was also the case in Zanzibar, where fertility rates were close to 3.6 children per woman of reproductive age, with life expectancy equating an average of 68 years, and under-five and infant mortality rates equal to 67 and 25.4 deaths per 1,000 live births, respectively (data retrieved from MoHCDGEC et al., 2016, and NBS and OCGS, 2018). As a result, Zanzibar has a relatively young population, with more than 60 per cent under the age of 24. While this places Zanzibar in the second stage of its demographic transition (i.e., decline in child mortality, prolongment of life expectancies and high fertility rates), Zanzibar's population composition also comes with the risk of suboptimal socioeconomic progress for the country's children and adolescents. This is especially the case in the areas of health and education, and may lead to insufficient economic growth once its youth bulge begins to enter the labour force, resulting in a nationwide poverty trap – one that will be difficult to escape given the current condition of Zanzibar's labour market.

In addition to a large informal economy, Zanzibar's labour market exhibits too few job opportunities for the growing youth population. In fact, roughly 33 per cent of those aged 15 to 24 years were unemployed in the country in 2021. This is far above the national average of 19.7 per cent. Furthermore, of those who did find employment, 41.7 per cent (the majority of which were women), were in the informal sector.

Consequently, whether the growing youth population is able to positively contribute to

Zanzibar's economy and subsequently reap the benefits of economic growth is largely dependent on the government's investment choices. In order for the country to benefit from its children and youth in the future, the RGoZ will need to address several challenges, including:

- Its continued high fertility rates;
- The overconsumption of resources by growing populations that limit social and productive investments;
- Low investment in the social sector;
- Few and/or low-quality jobs;
- The large informal economy; and
- Limited opportunities for women to enter the labour market (UNICEF, 2019a).

If budgets do not effectively support the alleviation of these challenges while simultaneously promoting broader economic growth and job opportunities, the country's youth will either be unprepared to contribute to the labour market or unable to find decent work. This scenario has the potential outcomes of rising poverty and inequality, social and political instability, and emigration. If the government strategically invests in children and youth, however, the population boom can increase economic growth, improve economic opportunities, and ensure long-term peace and prosperity (UNICEF, 2019a).

This report assesses the implications the demographic transition and the status of service delivery (and associated public investments) have on the journey of children and adolescents transitioning to adulthood and the labour market. Chapter 1 commences by explaining the relevance of the demographic transition and outlines its various stages. It analyses the socioeconomic context of Zanzibar, placing particular focus on its children and youth. This includes an analysis of the country's demographic trends, allowing the identification of the country's current status in its demographic transition. Chapters 2–4 outline the macroeconomic model used to estimate the fiscal impact of a country's demographic transition based on two

population growth rate scenarios. While Chapter 2 details the methodology used, Chapter 3 focuses on the results of Zanzibar's demographic transition and its fiscal impact on the education, health, and water, sanitation and energy sectors. The findings are complemented by outlining how population growth

affects the country's labour market as well as its poverty level. The paper concludes with Chapter 4, which provides conclusions and recommendations that could help Zanzibar reap the full benefit of its demographic transition, whilst achieving inclusive growth and economic transformation.

Box 1: Terminology

Throughout this report, a distinction is made between different concepts used during the modelling process. To clearly identify and clarify these concepts, and their interplay, they are defined below.

Population growth scenarios indicate instances in which the modelling assumed either low or high population growth rates. Consequently, the report speaks to a high population growth scenario, and a low population growth scenario. The high population growth scenario assumes total fertility rates that are projected in line with past fertility rates retrieved from Zanzibar's demographic and health surveys, projections outlined in the National Projection Report as well as targets set under the Zanzibar Development Vision 2050. The low population growth scenario assumes annual total fertility rates that are 0.5 births below that of the high population growth scenario. For more information see Appendix 4 (online).

Public investment levels indicate instances in which the modelling assumed public investment levels to continue as they are (i.e., low investment level) or are increased in order to meet international and national policy targets (i.e., high investment level).

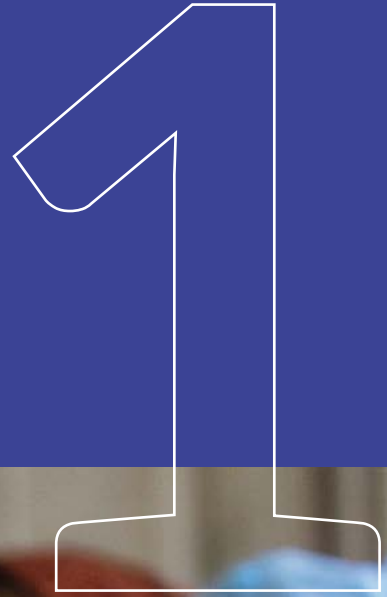
Trajectories represent the interplay between the aforementioned population growth scenarios and public investment levels. Consequently, four possible trajectories are possible, of which the report discusses two in detail:

- **The most-favourable trajectory:** The interplay between low population growth rates and high public investment levels; and
- **The status-quo trajectory:** The interplay between high population growth rates and low public investment levels.

The remaining two trajectories (capturing, respectively, the interplay between high population growth rates and high public investment levels and the interplay between low population growth rates and low public investment levels) are discussed further in the appendices to this report, which can be found online.

Chapter 1

THE DEMOGRAPHIC TRANSITION



1.1 What is it and how can it benefit countries?

In the mid-twentieth century, a generalized description of a nation's pattern in mortality, fertility and growth was developed to understand the numerous demographic profiles that could be found across the world. This

became known as the demographic transition theory, which has been elaborated and expanded upon through the years. Embedded in this theory is the assumption that a strong correlation exists between fertility and mortality rates on the one hand, and industrialization and economic development on the other (Agarwal, 2021). Consequently, the model provides a structure detailing what is likely to occur as a country's population experiences socioeconomic development.

Through the reduction of child mortality and improvements in education, especially among women, countries do not only curb the rapid expansion of their population, but are also able to ensure that individuals add economic value. As time passes and the population growth rates continue to slow, countries can convert a larger proportion of their continued technological progress and gains from factor accumulation into increased per capita income (Galor, 2012). According to the literature, this has enhanced labour productivity and economic growth through three main channels:

1. The reduction in population growth rates allows for a reduction in the dilution of capital stocks and infrastructure, thereby increasing the resources that are available per individual.
2. Lower fertility rates allow families to focus on the quality of their children's lives instead of the quantity of children they have, thereby enhancing the development of human capital and improving overall labour productivity.
3. The decline in fertility rates allows for a larger proportion of the population to be of working age, thereby lowering the overall dependency ratio (the ratio of children (0–17) and elderly (65 and above) to those of working age (18–64)) and increasing productivity per individual (Galor, 2012).

For all these gains to materialize, a country will typically transition through five distinct stages –

from a level of high dependency to one of low dependency (as described in Section 1.2). Each of these stages requires changes in policies and significantly increased sectoral investments in order to continue the path of transition to economic prosperity.

1.2 The stages of the demographic transition

Stage 1: Typically, in the first stage of a demographic transition, both the birth and death rates are high – resulting in slow population growth rates – a phenomenon that was typically seen in most countries before the Industrial Revolution (see Figure 2) (PACE, n.d.; UNICEF, 2019a and 2019b; World Bank, 2020). Countries at this stage are usually characterized as underdeveloped, with a high dependency ratio and a stable population. When there is limited availability of food in addition to insufficient health care and sanitation, population growth rates are stagnant as a result of disease and starvation, especially among children. The high rates of child mortality and an agrarian lifestyle cause parents to want larger families.

Stage 2: With the introduction of modern medicine, in addition to better sanitation facilities and policies that promote agricultural productivity, a country begins to experience socioeconomic development, thereby moving into the second stage of its demographic transition. As a consequence, mortality rates, especially among children and young adults, fall rapidly and life expectancies are prolonged, yet birth rates stay high causing a rapid growth in the country's population (PACE, n.d.; UNICEF, 2019a and 2019b; World Bank, 2020).

Stage 3: Over time, the country's economic conditions start to improve even more due to improved family planning methods, access to contraception, less need for large families given more employment opportunities in the industrial sector, higher wages and an increase in the social

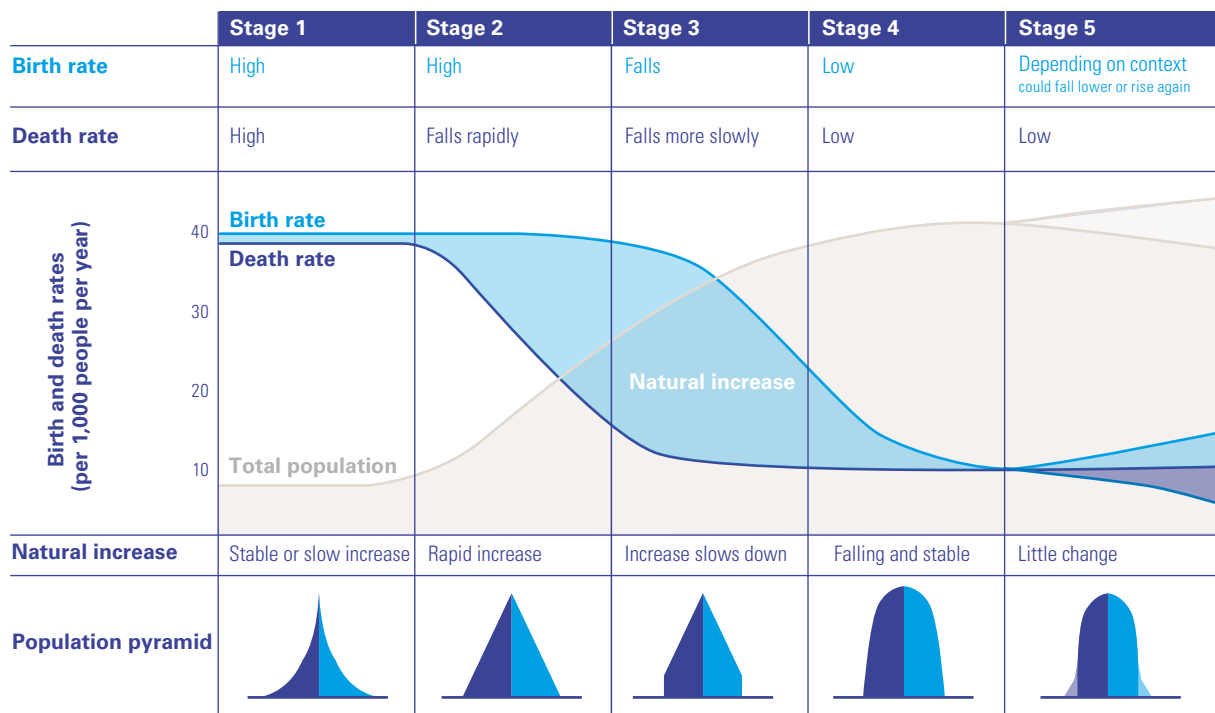


Figure 2: The stages of the demographic transition

Source: Adapted by author from Agarwal, 2021.

status of women. This initiates a reduction in fertility rates that is larger than the decline in the country's mortality rates.

During this third stage of the transition, the country's population continues to grow, but at a lower rate. It is especially the working-age population that sees an expansion, thereby lowering the overall dependency ratio. This creates an opportunity for the children and youth to add further value to the country's economic performance if appropriate policies are implemented that not only foster individual productivity through a further increase in their human capital and health, but also generate decent employment opportunities in the formal sector (PACE, n.d.; UNICEF, 2019a and 2019b).

Stage 4: Subsequently, during this stage of the demographic transition, both fertility and mortality rates are low. Consequently, the population stabilizes again, yet at a higher level of socioeconomic development because of higher levels of education, improved health care, the creation of employment opportunities for women and changes in human behaviour. These changes include couples

wanting fewer children given the low rates of infant and child mortality, while simultaneously wanting to better the lives of the children they have. While this reduces the number of children, it does so at a slower rate than during the previous stage (PACE, n.d.; UNICEF, 2019a and 2019b). In conjunction, women will increasingly seek to enter the labour market instead of remaining at home (African Union Commission et al., 2013b; PACE, n.d.; UNICEF, 2019a). Thus, Stage 4 of the demographic transition provides an opportunity for strong economic growth, if appropriate policies are implemented.

Stage 5: Following Stage 4, the birth rate usually declines below replacement levels (2.1 children per woman); thereby signalling the last stage of demographic transition, where the population shrinks and grows older. Combined with low mortality rates, the population of the country starts to rapidly age, while the share of the working-age population decreases. These effects allow for the total population to slowly decrease, the dependency ratio to rise and economic growth to slow (African Union Commission, 2013b; PACE, n.d.; UNICEF, 2019a). Without appropriate investments into sectors

that promote economic growth and productivity, the country will run the risk of falling into the middle-income trap – a concept that characterizes countries that have experienced rapid growth and thus rapidly attained middle-income status, but then failed to sustain productivity that would have allowed them to reach high-income status.

1.3 How does the demographic transition have an impact on the future of children and adolescents?

From the perspective of the child, the demographic transition mirrors a competitive challenge. During the first stage, high rates of fertility not only result in an increasing number of children surviving per family, but also a rise in the size of birth cohorts (Lam and Marteleto, 2008). In other words, children at this stage are in competition for resources both at the household as well as the population levels.⁵ For example, when considering educational attainment, high levels of fertility result in families needing to divide their financial resources among a larger number of children. If these financial resources are scarce, families might not invest, or only invest in the basic accumulation of human development, or invest in the human capital of only some of their children, given that children are also needed to work to supplement the potentially low income of their parents (Serra, 2004). With lower levels of educational attainment, children cannot grow to their full potential and contribute to economic development.

At the population level, a disproportionately high number of children may lead to overcrowded classrooms if appropriate infrastructure and resources (qualified teachers, textbooks, etc.) are not provided. Without investments in these areas, the quality of education for the general population will decline, again impacting their potential future productivity. For children born during this stage of the demographic transition, it is therefore paramount to implement conventional population interventions,

(family planning programmes, information campaigns, provision of contraception) alongside policies that provide free basic, yet compulsory, education and health care, thereby limiting the potential of child labour, increasing the stock of human capital available and improving the overall well-being of children (Serra, 2004).

With the decline in mortality during Stage 2, the size of families become smaller, yet the birth cohort continues to grow as a result of high, albeit declining, population growth rates. Therefore, while children now have fewer siblings and more resources available at the household level, the competition for resources at the population level continues (Lam and Marteleto, 2008). In addition to sustaining investments in health and education with the aim of expanding coverage and improving quality over time, countries at this stage must now also ensure augmentation of the skills of their youth and those in their early adulthood, while developing adequate employment opportunities, as a large number of children from Stage 1 will now be entering employment. Here, it is of special importance to ensure that increasingly more and better employment opportunities are present in the service and industry sectors, as these commonly expand with economic development.

Without the necessary skills to compete in the formal labour market or with a shortage of decent employment opportunities, many individuals, especially women, will either remain unemployed, underemployed or seek refuge in the informal sector – situations that can instigate social, political, and economic instability. In general, conditions in the informal sector are often hazardous. Workers do not have adequate protection and earn low wages. In addition, the value added to the economy is often low, thereby contributing less to economic growth than potentially possible (Deléchat and Medina, 2020; ILO, n.d.; OECD and ILO, 2019).

It is only during Stages 3 and 4 of the demographic transition that competition at both levels (household and population) declines. Yet, while this implies socioeconomic development and improved standards of living for children,

⁵ These resources include among others parental time, access to public services, and nutritional resources.

it also entails unprecedented challenges. It is estimated that, globally, persons aged 55 years and above will outnumber all children up to 14 years of age by 2035, and all children and youth (0–24 years) by 2080 (Harasty and Ostermeier, 2020). Consequently, the present and future working-age populations become smaller but are required to support an increasing number of dependents, mostly of old age, as the previous cohorts of the high population growth rate stages are now likely to retire and live longer lives (Lee and Mason, 2017).

Given that those who are employed contribute to public services through social security contributions and taxes, an ageing society would imply a larger financial burden on the present and future working-age population. Without increased social security and tax contributions, a country would not be able to finance its higher spending commitments on health care since the tax base on which revenue can be collected is smaller. In addition to this, a country may potentially run into labour shortages because of low fertility rates, which could affect labour productivity, wages and, ultimately, economic growth (Jimeno et al., 2020). To counteract this trend, several countries faced with an ageing population have implemented policies that either promote fertility increases, immigration or an increase in the retirement age. However, in the case of the latter, caution is required, as a country's economy will need to be able to absorb the increase in the labour force to avoid

disadvantaging the youth that will be entering the labour market (Bengtsson and Scott, 2010).

1.4 Zanzibar's demographic situation: now and in the future

Given the rapid decline in mortality and a relatively high total rate of fertility, Zanzibar can be classified as being in the second stage of its demographic transition. From 2000 to 2020, Zanzibar made significant progress in health care thanks to investments made in alignment with their Development Vision 2020. Consequently, mortality rates is less than half, decreasing from 10.1 deaths per 1,000 persons in 2000 to 4.3 deaths in 2020 (NBS, 2006; NBS and OCGS, 2013 and 2018), leading to a rise in overall life expectancy as well as a reduction in infant and child mortality. Simultaneously, the use of family planning mechanisms led to a decline in total fertility rates from 7.3 children per woman in 1967, to 6.4 children in 1988 and 4.5 children in 2017 (see Figure 3) (NBS and OCGS, 2018; the 2017 Malaria Indicator Survey data for Zanzibar (USAID)). The Tanzania National Bureau of Statistics (NBS) and OCGS estimate that by 2035 total fertility will have declined further, attaining a level of three children during a woman's reproductive lifespan (NBS and OCGS, 2018).

This rate of reduction is larger than the rate exhibited in all of Zanzibar/Tanzania's eight

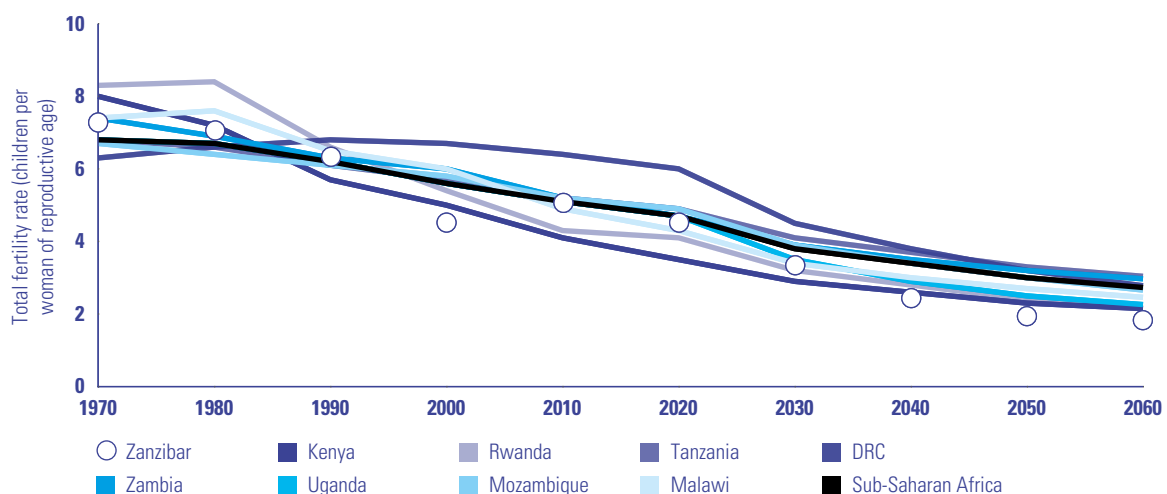


Figure 3: Total fertility rate across time

Source: Author's calculations based on assumptions in NBS and OCGS, 2018, and on UNDESA, 2019a.

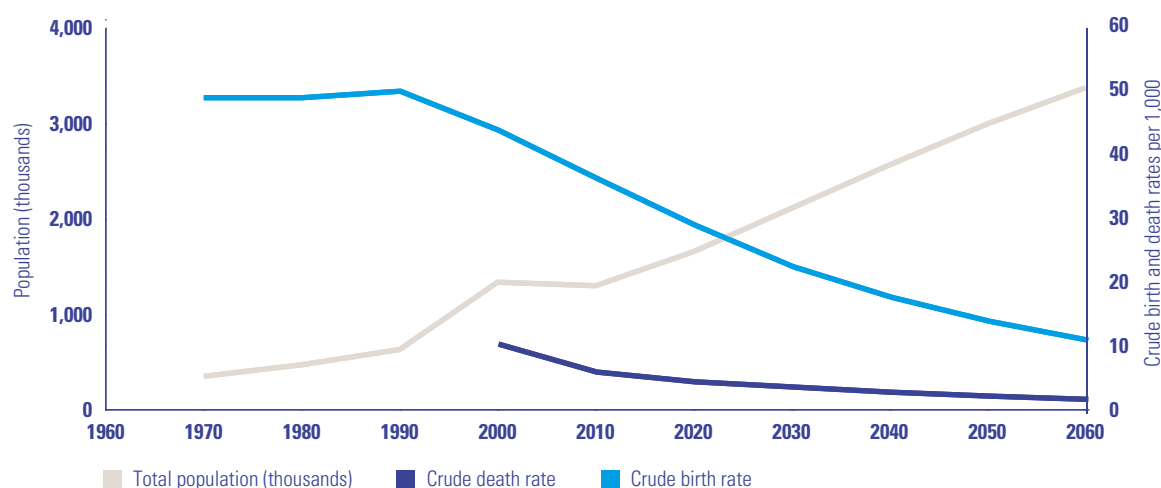


Figure 4: Zanzibar's demographic transition

Source: Author's calculations based on NBS, 2006; NBS and OCGS, 2013 and 2018; and UNDESA, 2019a.

neighbouring countries, as well as in sub-Saharan Africa (see Figure 3). Simultaneously, the crude birth rate also reduced from 48 births per 1,000 women in 1970 to 36.3 births in 2015/16 (OCGS, 2021c; NBS, 2006). Provided that Zanzibar achieves the objectives outlined in its Vision 2050,⁶ the crude birth rate is projected to fall even further, attaining a level of 10.7 births per 1,000 women by 2060 (see Figure 4).

The combined changes in mortality and fertility have had an impact on the country's population growth rate, which has already led to significant changes in Zanzibar's age structure.

This is evidenced in the population pyramids seen in Figure 5, which illustrate the change in Zanzibar's population structure over time (the proportion of the population per age group across time). In line with a rapid decline in mortality rates and a lower reduction in fertility, Zanzibar's population grew from an annual average of 2.7 per cent during 1967–1978 to 3.1 per cent during 1988–2002 and 3.3 per cent annually during 2013–2021. In absolute terms, this represents an increase from 354,815 citizens in 1967 to approximately 1.7 million in 2021. Furthermore, when compared to its neighbouring countries, Zanzibar has, over the past 15 years, grown at or above the average rate witnessed by its neighbouring countries as well as countries in sub-Saharan Africa (see Figure 6).

In addition to this, changes in policies promoting education and health care have allowed life expectancy at birth to rise from 50.9 years in 2002 to 68 years in 2020 with further increases expected over the following 15 years. This would allow Zanzibar's life expectancy to reach 73.2 years by 2035.

Disaggregated by sex, this is projected to equate to 69.6 years for men and 76.6 years for women (NBS and OCGS, 2018). Any increases in the future will be contingent on further progress made towards Zanzibar's Vision 2050. Such progress will need to include the establishment of a highly reliable and accessible primary health-care sector; universal health coverage; effective pre-service training programmes; a resilient health-care system that has adequate contingency plans in place; as well as diversified and sustainable health-care financing that allows for the provision of quality services for all individuals on Zanzibar (RGoZ, 2020).

Furthermore, with fewer births and lower mortality, Zanzibar's child (0–17 years) and youth (18–24 years) population has decreased as a percentage of the total population since 1988, while the proportion of its working-age population (18–64 years) is expanding – thereby decreasing the country's overall dependency ratio. This demographic transition is expected

⁶ Zanzibar's Development Vision 2050 (RGoZ, 2020) is a policy document that sets out the strategic sectoral objectives and targets to be achieved by Zanzibar by the year 2050.

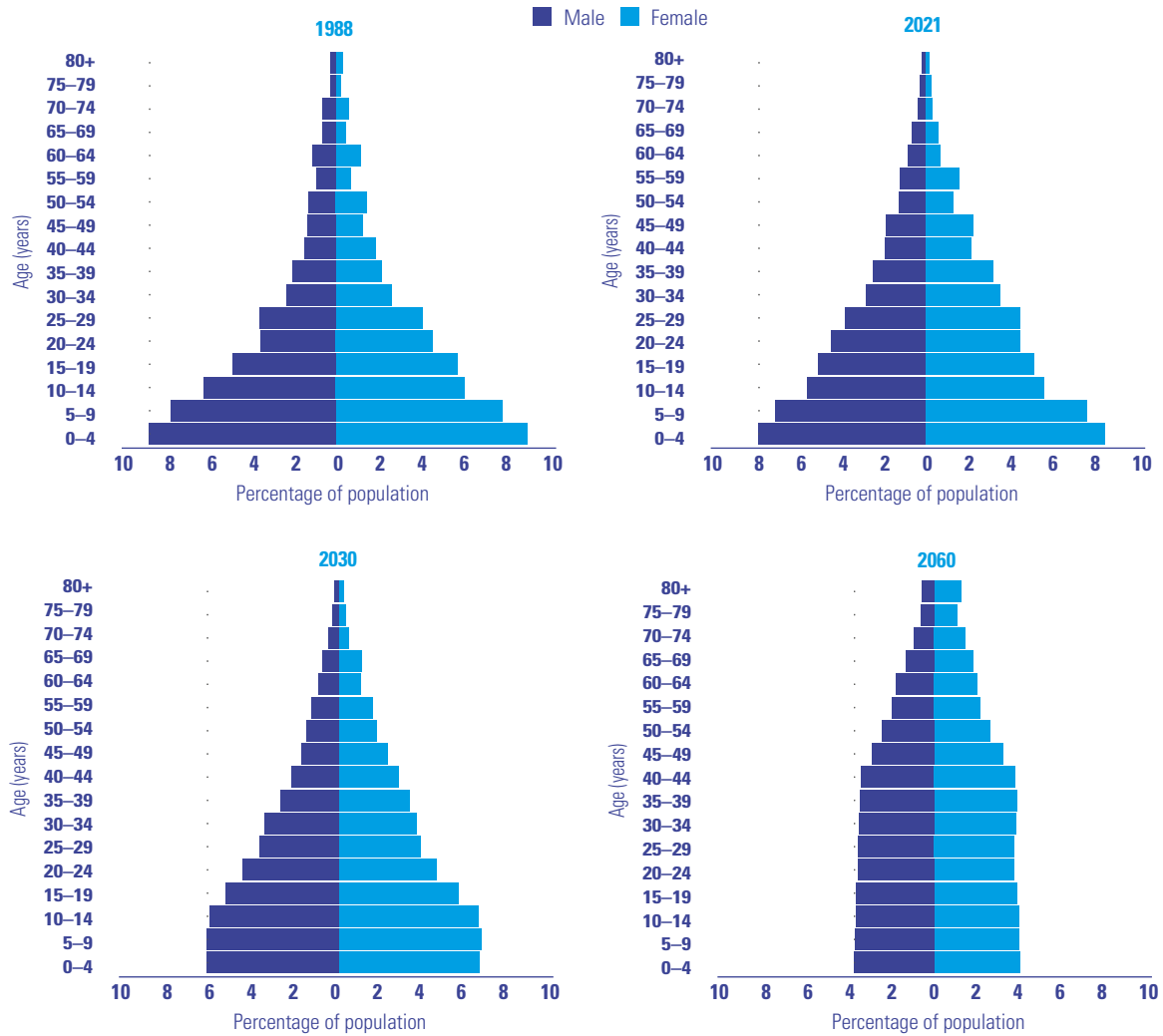


Figure 5: Population pyramids for Zanzibar for 1988, 2021, 2030 and 2060

Note: Data obtained from the 1988 and 2012 population censuses, as well as the population projections calculated by the author based on projections received by the OCGS.

Source: Author’s projections based on assumptions in NBS and OCGS, 2018.

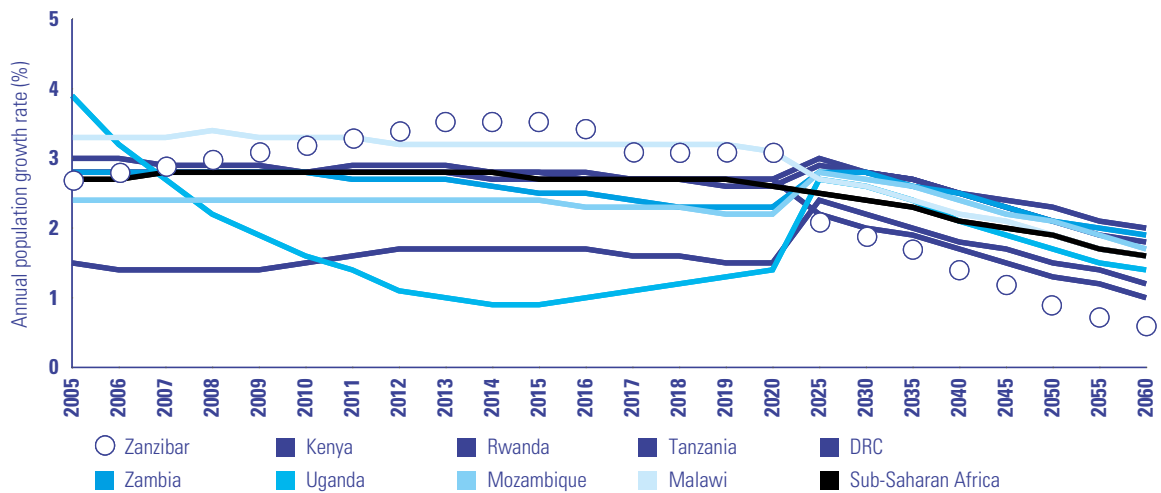


Figure 6: Annual population growth rate, 2005–2020

Source: Author’s calculations based on IPUMS International, n.d., and UNDESA, 2019a, and assumptions in NBS and OCGS, 2018.

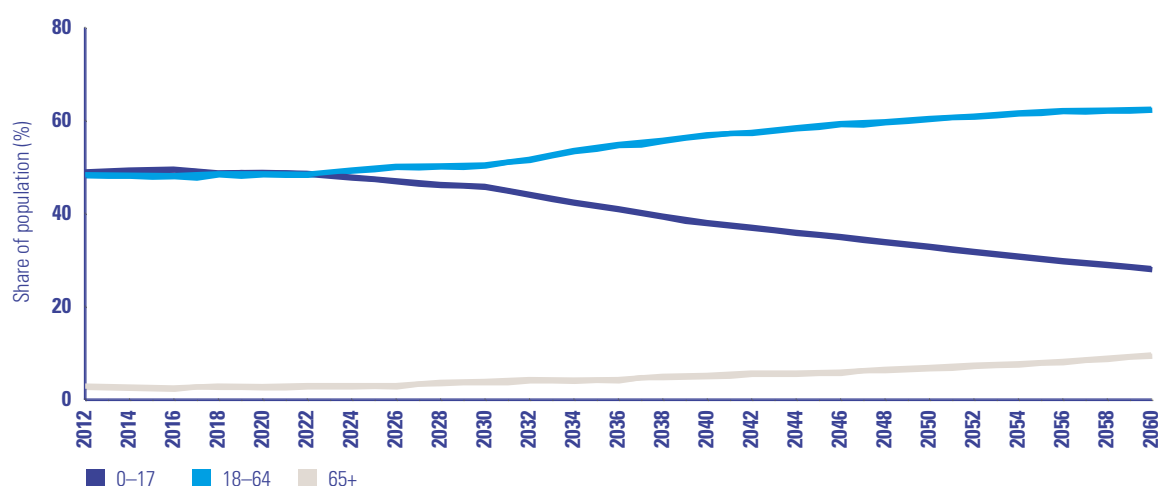


Figure 7: The window of opportunity – age-disaggregated population (%)

Note: These numbers are also reflected as a tabulation in Table 5.

Source: Author's calculations based on UNDESA 2019a and assumptions in NBS and OCGS, 2018.

to continue in the future with the proportion of children as a share of the total population expected to decline from approximately 48.8 per cent in 2020 to 28.1 per cent in 2060.⁷ In contrast, the share of the working-age population will increase from 48.5 per cent in 2020 to 62.4 per cent in 2060 (see Figure 7). This means that for every 100 individuals aged 18–64, the number of dependents (aged 0–17 and over the age of 64) will decline from 106.3 in 2002 to 60.4 in 2060.⁸ Over time, it will become increasingly important for Zanzibar to absorb the growing working-age population into the national labour market in order to avoid high levels of unemployment, but increase productivity and economic output – especially given that Zanzibar enters its window of opportunity⁹ in 2023 (see Figure 7).

Yet, taking advantage of this opportunity could be hindered by the high rates of un- and underemployment in the country, especially among the youth. Almost one in five individuals is unemployed, with the number rising to one in three

among the youth population. Unemployment has increased by roughly 14 percentage points since 2006 (5.5 per cent in 2006 to 19.7 per cent in 2021) (NBS and OCGS, 2021; OCGS, n.d.). Women face higher rates of unemployment than men, especially those residing in urban areas. Disaggregated by education level, 45.8 per cent of the unemployed have completed secondary or tertiary education (NBS and OCGS, 2021).

In addition to the high levels of unemployment, the creation of employment has only risen marginally since 2000, resulting in many individuals looking for work in the informal sector. In 2021, 41.7 per cent of the total employed were in the informal sector, the majority of which were, once again, women, and predominantly in urban areas (NBS and OCGS, 2021). This is detrimental for the country's development as the sector is characterized by micro and small-scale businesses and low-skilled employment, which are largely situated in rural agriculture, fishing and urban retail sectors (MoLYWCD, 2007). Combined with low wages and a relatively high level of

⁷ Author's calculations based on the projected population (NBS and OCGS, 2018).

⁸ Author's calculations based on the projected population (NBS and OCGS, 2018). Notably, the conventional definition of the dependency ratio has been adapted to align with UNICEF's definition of children. As a result, the dependency ratio in this report can be defined as those dependent (aged 0–17 years, and 65 years and above) over the working-age population (those aged 18–64 years). Given Zanzibar's relatively high rate of fertility and its low child mortality rates, the population that is dependent accounts for 51.6 per cent of the entire population; thereby attaining a dependency ratio that is over 100.

⁹ This is defined as a period where Zanzibar's age structure has changed advantageously, thereby favouring economic development.

underemployment, especially among the youth, little value is added. In 2021, roughly 16 per cent of the employed worked fewer than 40 hours per week, even though they were willing and available to do more work (NBS and OCGS, 2021).

Combined, these factors represent lost opportunity. The existing human capital that currently remains unemployed could contribute significantly to the Zanzibari economy if adequate formal sector

employment in the productive sectors of the country was created. Especially considering the change in the population's structure, significant focus needs to be placed on generating productive employment opportunities for the youth, thereby decreasing the under- and unemployment rates. Without such focus and with a growing working-age population, the present challenges, including a current youth unemployment rate of 33.6 per cent, will worsen.

Box 2: A sectoral snapshot

Education sector

In 2019/20, TSh196.2 billion (US\$84.4 million) were approved to progress on reaching the outlined targets in the 2017–2022 Zanzibar Education Development Plan II. This equates to 13.8 per cent of the total government budget and 4.2 per cent of GDP – both of which had declined since 2017/18 (UNICEF and RGoZ, 2018a, 2021a). This decline is alarming given that, over the same time period, the number of registered pre-primary, primary and lower secondary students rose as a result of changes in government policy. While primary education has been free since 1964, the government extended this to include lower and upper secondary schooling in 2019. Consequently, the gross enrolment rates for pre-primary, primary and secondary education equated to 69.2 per cent, 116.5 per cent and 85.6 per cent, respectively, in 2019 (UNICEF and RGoZ, 2021a). Few enrolled students drop out during primary education (1.3 per cent). As a result, the promotion rates are high, as evidenced by more than seven out of ten students who start Standard I completing the six-year primary cycle. This is a lot higher compared to secondary schooling, where only roughly one of two students graduates Form IV. This can be explained by the relatively higher dropout rates of, on average, 11 per cent (Annual Joint Education Sector Review Technical Working Group, 2019; UNICEF and RGoZ, 2021a).

Health sector

In the 2019/20 financial year, a total of TSh109.9 billion (US\$47.3 million) was allocated to the three levels of public health care. This constituted 7.7 per cent of the national budget – a decline from the 8.3 per cent in 2018/19, and also significantly below the 15 per cent target outlined in the Abuja Declaration as well as the proportion allocated by countries that have successfully achieved universal health coverage (MoH, n.d.; UNICEF and RGoZ, 2018b, 2021b). Furthermore, as a percentage of GDP, the 2019/20 value of 2.4 per cent is also below the World Health Organization (WHO) recommended share of 5–6 per cent of GDP to achieve universal health coverage. Per capita, this would currently equate to US\$29.¹⁰ As a result, Zanzibar's health sector continues to face significant challenges, especially when considering children and women. These are exacerbated by severe shortages of skilled health workers, especially in rural and remote areas of Zanzibar. In fact, the lack of doctors, nurses and midwives has contributed to the high rates of infant, under-five and maternal mortality rates exhibited. This, in combination with shortages of medicines and a suboptimal state of facilities and health technologies, illustrates that the present resources available are not sufficient to ensure the full provision of free quality health services for all individuals of Zanzibar (MoH, n.d.).

10 Based on author's calculations using Zanzibar's health budgets (UNICEF and RGoZ, 2018b and 2021b).

Infrastructure sector

In terms of *electricity*, there is no independent producer of power on Zanzibar as it is imported from Mainland Tanzania through the use of submarine cables. As a result, Zanzibar is highly dependent on the correct functioning of these cables. Any supply outages have significant negative impacts on Zanzibar's economy. Furthermore, the demand for electricity is rapidly growing by an average of 8 per cent per year due to the country's economic growth as well as the rapid expansion of the tourism sector (World Bank, 2019). Previously conducted projections by the World Bank conclude that demand will exceed the available capacity by 2022 (World Bank, 2019).

In terms of *water and sanitation*, the RGoZ aims to improve the social well-being of its people, while also enhancing the performance of the economy by ensuring the equitable and adequate provision of water and sanitation services. Furthermore, it places emphasis on cost recovery, the environmental protection of existing resources, as well as the sustainability of investments into this sector. This is of importance given the fact that many parts of Zanzibar have been facing critical water shortages due to the dilapidation of the water infrastructure (e.g., leaking pipes), as well as a decline of water supply from springs and other natural sources due to the impact of climate change (African Development Fund, 2020). This places a burden on many Zanzibari households, especially women and children, as they are forced to go out and look for fresh water. According to ZAWA, the country needs more than 200 million litres of fresh water per day for its population, yet only roughly 50 per cent of this requirement is available (Yussuf, 2015). In order to lessen this burden and provide more fresh water for its people, the RGoZ has implemented a number of measures, including the protection of the environment close to natural sources of water; the construction of boreholes and wells; the minimization of water wastage through the introduction of consumption meters; as well as improved infrastructure (African Development Fund, 2020).

Social development sector

Zanzibar is at the second stage of its demographic transition and, as such, one of the main challenges that the RGoZ will face over the coming four decades is to ensure that the growing working-age population, especially the youth, will have access to productive labour market opportunities. This has proved to be a difficult undertaking in the past. With a rapidly expanding population, along with high rates of fertility and a lack of adequate job creation, unemployment has been a pressing socioeconomic problem. While the rate stood at 5.5 per cent in 2006, this increased to 14.3 per cent in 2014 (OCGS, 2016, n.d.). In addition, labour force participation rates fell from a level of 83.4 per cent in 2006 to 79.4 per cent in 2014 (OCGS, 2016, n.d.). In all five regions, men had higher labour force participation rates than women. This is also the case when considering Zanzibar's youth, where the labour force participation rate was equivalent to 72.5 per cent for males and 65.5 per cent for females in 2014 (OCGS, 2016). Furthermore, women experienced lower access to productive jobs and wage employment, and are thus more likely to work in the informal sector where employment conditions are less secure than those of men (World Bank, 2017). Combined, these factors have affected the standard of living of Zanzibaris and have resulted in a continuously high rate of poverty – equivalent to 30.4 per cent in 2015 and 25.7 per cent in 2020 (OCGS, 2021b; World Bank, 2017).

(For more detailed information on the four sectors, please see Appendix 2 (online).)

Chapter 2

METHODOLOGY



2.1 The trajectories and underlying sectoral analyses

The demographic transition in Zanzibar can take one of two paths – one where population growth resembles the most likely path that the country will take in the future (i.e., high population growth scenario) and one in which the RGoZ makes deliberate choices to reduce the future population growth rate in the country (i.e., low population growth scenario). **Each of these two population growth scenarios can yield two possible choices in terms of public investment levels**, i.e., low public investment levels or high public investment levels (see Figure 8).

Under the choice of low public investment, the methodology models the implications of population

growth assuming that the current (2021) access and quality of identified components within the sector remain constant over time. In other words, this choice presents how much a government would need to invest to finance the system *if the current level of sectoral indicators were to be maintained between 2021 and 2060* in light of a rising population. Here, it is of importance to highlight that the government would need to continue to invest in the identified sectors as illustrated by the education example in Figure 9. Although secondary public enrolment rates remain constant over time, a growing population would result in an increasing number of enrolled students. These need to be catered for by the RGoZ through additional textbooks, classrooms, teachers and schools, thereby resulting in an increase in education expenditure over time.

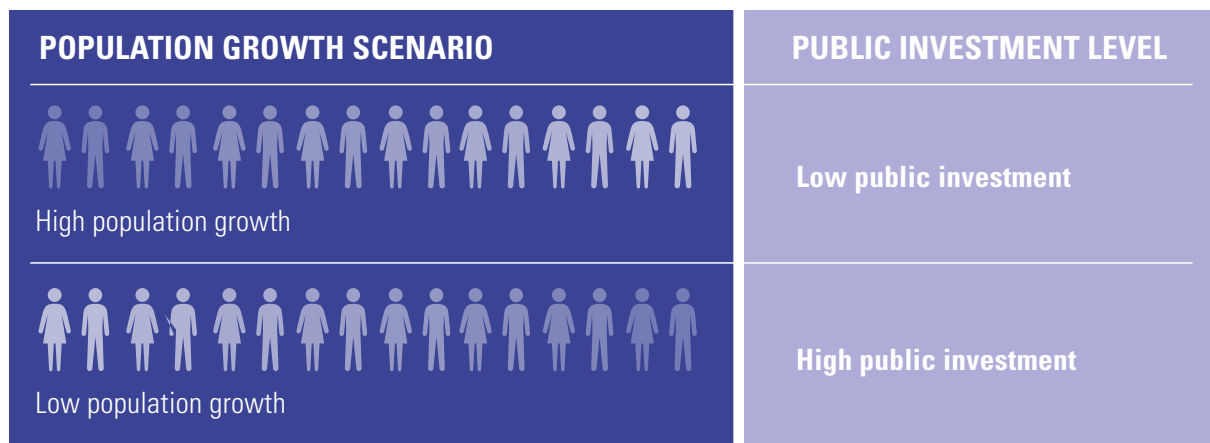


Figure 8: Modelled scenarios and levels of public investment

Source: Author

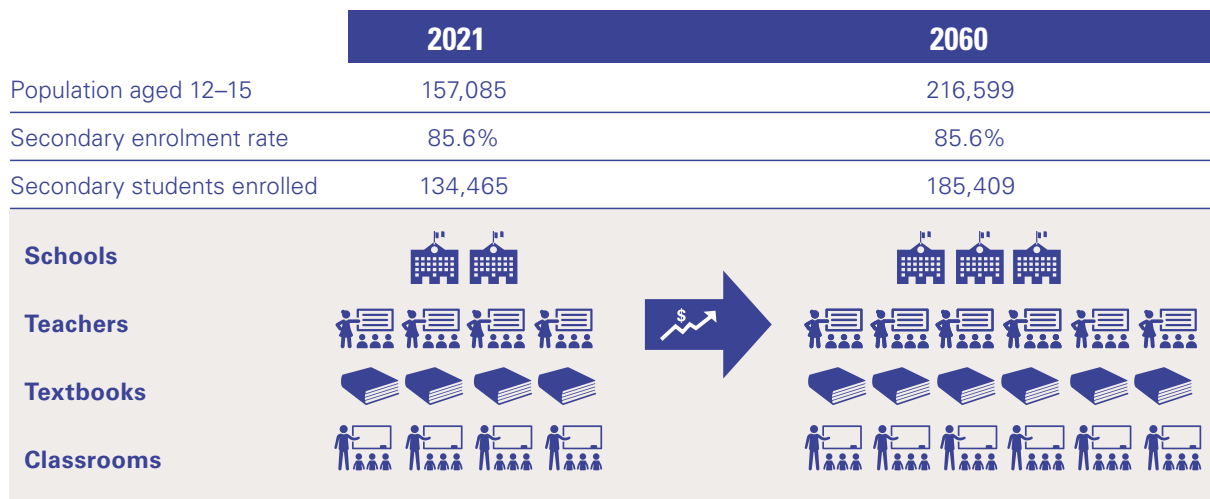
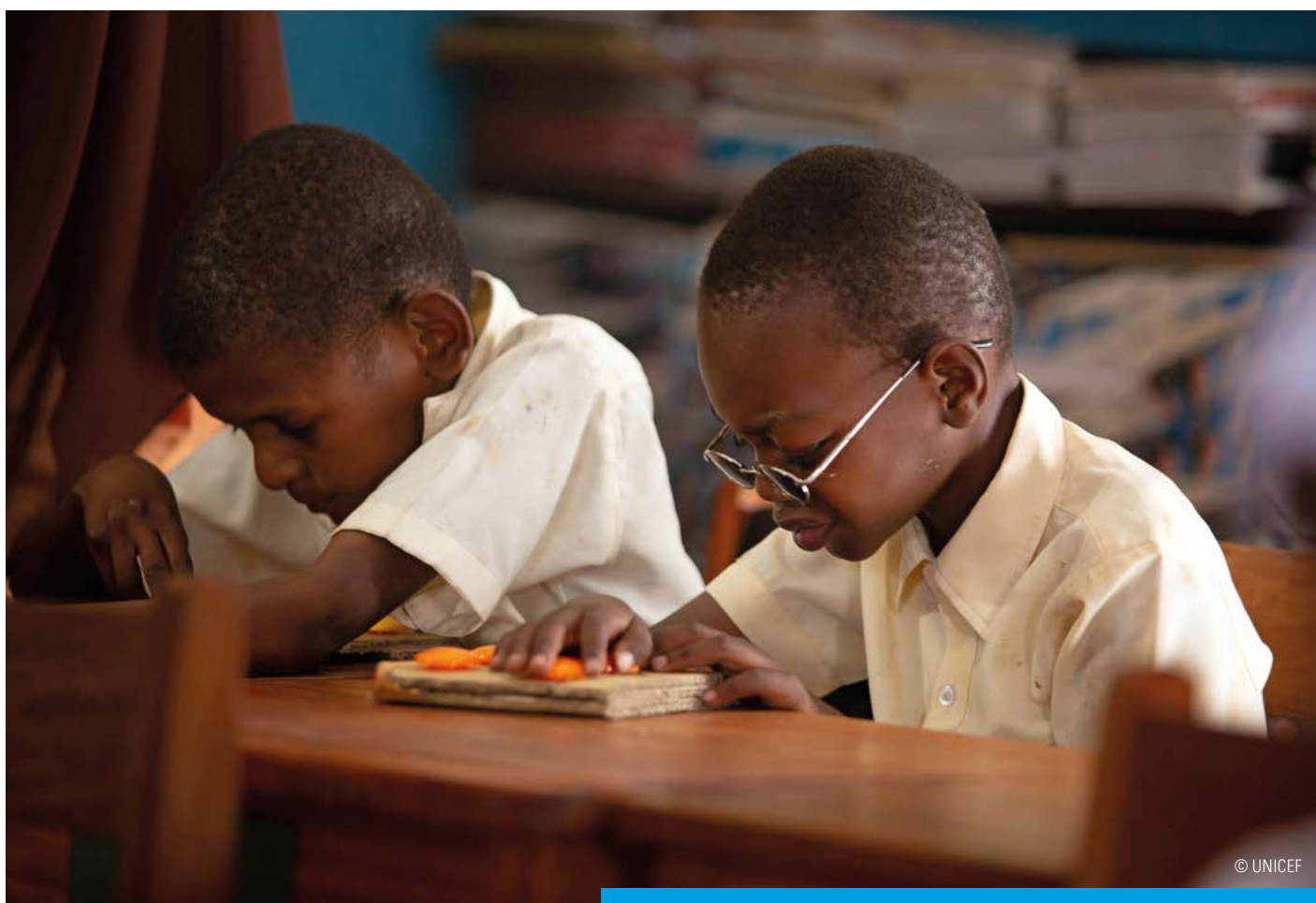


Figure 9: Example of rising government investment in education under the low-public-investment choice

Source: Author's calculations based on assumptions in NBS and OCGS, 2018.



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Under the choice of high levels of public investment, the methodology models the implications for government given a *gradual improvement in key sectoral parameters that are related to access and quality* (see Table 2). These improvements are in line with targets set in policy documents – the Development Vision 2050 in the case of Zanzibar as well as other sectoral plans (the Zanzibar Education Development Plan II 2017–2022; the Zanzibar Health Sector Strategic Plan III 2014–18; the Zanzibar Investment Guide 2019/20, etc.).

Each of the two aforementioned population growth scenarios along with their public investment levels are modelled for four specific sectors up to 2060. A specific methodology was devised for the education, health and infrastructure sectors to quantify the fiscal implications that the four

trajectories will have for the RGoZ, both in absolute terms (TSh and US\$) and as a percentage of GDP and total government expenditure.¹¹ The methodology for the social development sector aims to quantify the impact of both population growth scenarios and their public investment levels on Zanzibar's employed and unemployed population, GDP, GDP per capita and poverty rate.

Across each sector and for each population growth scenario, current sectoral proxies for access and quality are assumed to remain constant under low levels of public investment, while they are assumed to gradually improve over time under high levels of public investment, as shown in Table 2. The underlying sectoral methodology and specific assumptions made are provided in more detail in Appendix 1 (online).

¹¹ Here it must be noted that GDP and government expenditure were computed for the years 2022 to 2060. This was done based on the 2021 values and their assumed targets (i.e., nominal average GDP growth rate, government expenditure as a share of GDP, and the inflation rate) over time as shown in Table 2.

Box 3: The assumptions underlying the population growth scenarios

When undertaking the projection of fertility across time, it is of crucial importance to use well-tested and well-assessed methodologies, especially given the fact that uncertainty will always exist when doing so. In general, projections assume that any observed long-term trend will continue to be exhibited into the future, therefore not aiming to predict any sudden or marked shifts in trends (Gleditsch and Syse, 2020). In the case of Zanzibar, the OCGS issued population projections until 2035. Yet, given that this is less than the projection period used for the analysis in this report, which runs to 2060, the projections needed to be extended.

To do so, Spectrum, a software program used for demographic modelling, was utilized. Within this program, the DemProj model projects the population for a country up to 50 years into the future based on assumptions about fertility, mortality and migration. These projections can be disaggregated by age, sex and place of residence. Given the relative scarcity and infrequency of data for Zanzibar, the underlying data for these projections were supplied by Tanzania's medium-fertility estimates produced by the two-track system of the Population Division of the United Nations (UNDESA's World Population Prospects). The methodology accounts for the past experience of the country, while also using that of countries under similar conditions to reflect uncertainty about future changes (Gleditsch and Syse, 2020). In the case of Zanzibar, the underlying assumptions for the projections were then adjusted, where possible, based on the OCGS's national population projection report or the targets outlined under Zanzibar's 2050 Development Vision (see Table 1). The resulting population projections resulted in a high population growth scenario – the most likely population growth scenario that Zanzibar would follow over the coming four decades.

As the report at hand also aims to quantify the benefits of reducing population growth over time, a second projection – a low population growth scenario – was established. This scenario is based on the same assumptions as exhibited under the high population growth scenario, except for the total fertility rate, which was assumed to be 0.5 births below the rates utilized for the high population growth scenario. The reason for doing so is to be in line with the well-tested and well-assessed methodology of UNDESA, especially given the fact that the high population growth scenario is, in part, based on the same underlying methodology. This ensures consistency and allows for the establishment of the low population growth scenario, which infers an additional effort by the RGoZ to lower fertility over time, and consequently the population growth rate. It is also feasible given the implementation of effective multisectoral policies, especially when considering education, health, infrastructure and social development.

Table 1: Key assumptions of each population growth scenario

Indicator	Baseline (2021)	2030	2040	2050	2060
High population growth scenario					
Total fertility rates	4.5	3.39	2.49	1.99	1.89
Sex ratio at birth	95.1	95.7	96.0	96.4	96.8
Life expectancy (male, years)	65.7	68.1	71.1	74.1	77.1
Life expectancy (female, years)	70.8	74.6	78.6	82.6	86.6
International migration	-1,106.17	-1,106.17	-1,106.17	-1,106.17	-1,106.17
Urban share of population (%)	44.6	46.5	48.5	50.6	52.6
Low population growth scenario					
Total fertility rates	4.5	2.89	1.99	1.49	1.39
Sex ratio at birth	95.1	95.7	96.0	96.4	96.8
Life expectancy (male, years)	65.7	68.1	71.1	74.1	77.1
Life expectancy (female, years)	70.8	74.6	78.6	82.6	86.6
International migration	-1,106.17	-1,106.17	-1,106.17	-1,106.17	-1,106.17
Urban share of population (%)	44.6	46.5	48.5	50.6	52.6

Source: NBS and ORC Macro, 2005; NBS and OCGS, 2013 and 2018; MoHCDGEC et al., 2016; UNDESA 2019a.

2.2 Limitations

While the methodology proposed does comprehensively project the impact of population growth across several relevant sectors, three main limitations can be identified. The first and second pertain to infrequently computed statistics by the RGoZ.

1. A dearth of data for the four sectors analysed in the model has required the use of assumptions for a number of key inputs, (e.g., future education and health budget growth rates, future GDP growth rates, future government expenditure as a share of GDP, future share of the health budget that is used for development purposes, etc.). However, while these assumptions are based on literature and verified with information retrieved from key informants, they may not always reflect the actual situation on the ground precisely.
2. Limited time series data for a number of indicators in the realm of education and health have not allowed for the estimation of correlation between sectoral spending and key sectoral outcomes (e.g., dropout rates, transition rates, infant mortality, maternal mortality, etc.). Instead, assumptions of such correlation needed to be made based on well-established literature in this field. While this does provide for relevant proxies, these may deviate from reality.
3. It must be noted that feedback loops of income generated over time, given improvements in the standard of living, are not endogenously included in the four sub-models. It is thus not possible to accurately predict to what extent the income of individual households will increase as a result of investment in education, health and infrastructure, and how this will affect the various outcome indicators across these sectors.



Indicator	Actual data	Targets							
	2021	2025	2030	2035	2040	2045	2050	2055	2060
Infrastructure									
People with access to electricity from national grid or solar power in urban areas (%)	80.5	87.6	96.0	100	100	100	100	100	100
People with access to electricity from national grid or solar power in rural areas (%)	38.4	60.8	89.0	100	100	100	100	100	100
People with access to piped water within 30 minutes of premises in urban areas (%)	75.4	77.8	97.0	100	100	100	100	100	100
People with access to improved water within 30 minutes of premises in urban areas (%)	17.1	57.1	97.0	100	100	100	100	100	100
People with access to piped water within 30 minutes of premises in rural areas (%)	82.7	89.8	97.0	100	100	100	100	100	100
People with access to improved water within 30 minutes of premises in rural areas (%)	10.2	53.6	97.0	100	100	100	100	100	100
People using basic improved and not shared sanitation services in urban areas (%)	63.7	81.8	100	100	100	100	100	100	100
People using basic improved and not shared sanitation services in rural areas (%)	34.1	67.1	100	100	100	100	100	100	100
Social development									
Demographic variables									
Expected years of education (female)	8.20	8.20	9.72	10.57	11.42	12.26	13.11	13.95	14.80
Expected years of education (male)	8.00	8.00	9.43	10.23	11.02	11.82	12.61	13.41	14.20
Mean years of education (female)	6.48	6.48	8.40	9.40	10.37	11.32	12.23	13.13	14.01
Mean years of education (male)	8.10	8.10	8.54	8.78	9.03	9.27	9.51	9.76	10.00
Mean years of education (both)	7.29	7.29	8.47	9.09	9.70	10.29	10.87	11.44	12.00
Modern contraceptive prevalence rate (married women)	10.0	10.00	25.00	33.33	41.70	50.00	58.33	66.67	75.00
Traditional contraceptive prevalence rate (married women)	4.3	4.30	3.33	2.78	2.22	1.67	1.11	0.56	0.00
Postpartum insusceptibility (months)	7.3	7.30	7.30	7.30	7.30	7.30	7.30	7.30	7.30
Sterility (per cent of all women aged 45–49)	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
Economic variables (African upper-middle-income country average)¹²									
Public institutions	3.43	3.45	3.49	3.58	3.72	3.88	3.99	4.05	4.08
Imports as a percentage of GDP	23.70	24.32	26.01	29.49	35.02	41.06	45.44	47.77	48.80
Labour market flexibility	4.46	4.46	4.46	4.47	4.48	4.49	4.49	4.50	4.50
Financial market efficiency	3.14	3.16	3.21	3.31	3.47	3.65	3.78	3.85	3.88
ICT use	1.09	1.15	1.30	1.60	2.09	2.62	3.01	3.22	3.31

12 The targets outlined for the economic variables are assumed to attain the average levels exhibited by African upper-middle-income countries. These are the targets that are attained by the most-favourable trajectory (see Box 1) under the social development sector.

Indicator	Actual data	Targets							
	2021	2025	2030	2035	2040	2045	2050	2055	2060
Economic variables (African lower-middle-income country average)¹³									
Public institutions	3.43	3.45	3.49	3.59	3.74	3.91	4.03	4.09	4.12
Imports as a percentage of GDP	23.70	24.08	25.10	27.20	30.55	34.20	36.84	38.25	38.88
Labour market flexibility	4.46	4.46	4.45	4.43	4.41	4.38	4.36	4.35	4.34
Financial market efficiency	3.14	3.14	3.13	3.12	3.10	3.07	3.06	3.05	3.04
ICT use	1.09	1.12	1.18	1.33	1.55	1.80	1.97	2.07	2.11
Cross-cutting indicators									
Nominal average GDP growth rate (%)	1.7	6.9	6.9	6.3	5.8	5.2	4.6	4.0	3.5
Government expenditure as a share of GDP (%)	25.0	26.3	27.5	28.8	30.0	31.3	32.5	33.8	35.0
Inflation rate (%)	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2

Source: Author's calculations based on Zanzibar's national budget briefs, the National Population Projections Report assumptions, as well as information provided by the World Bank (poverty rates, the growth elasticity of poverty), the World Economic Forum (the Global Competitive Index) and the United States Agency for International Development (USAID) demographic dividend (DemDiv) model (MoEVT, n.d.; NBS and OCGS, 2018; UNICEF and RGoZ, 2018a, 2021a; RGoZ, 2020).

13 The targets outlined for the economic variables are assumed to attain the average levels exhibited by African lower-middle-income countries. These are the targets that feed into the social development sector modelling as part of a sensitivity analysis of the most-favourable trajectory (see Box 1). Please see Section 3.2.5 for more information.

Chapter 3

RESULTS

3



This chapter and its respective subsections showcase the results of the quantitative modelling for the four different sectors analysed (education, health, infrastructure and social development). Results are modelled for both the high and low population growth scenarios, each of which showcases findings for low and high levels of public investment for the four sectoral sub-models. While the education, health and infrastructure sub-models provide an overview of the required investments by population growth scenario and public investment level, the social development model identifies the respective impact on GDP per capita and poverty. A summary overview of these findings per population growth scenario and public investment level can be seen in Figure 12.

For the sake of simplicity, the following two subsections will focus on presenting two trajectories

that the RGoZ could follow in the coming four decades: a status-quo trajectory and a most-favourable trajectory (see Figure 12). The status-quo trajectory assumes high population growth rates along with low levels of public investment to retain the current level of social outcomes. The most-favourable trajectory is characterized by lower population growth rates and high levels of public investment to improve access and quality of sectoral indicators over time that are aligned with national and international policies.

The results of the remaining two trajectories depicted in Figure 12, i.e., a trajectory characterized by a high population growth rate and high public investment levels and a trajectory characterized by a low population growth rate and low public investment, can be found in Appendix 3 (online).



3.1 The status-quo trajectory: high population growth with low level of public investment

3.1.1 Population projections

As seen in Figure 10, Zanzibar’s population will more than double by 2060. While there were close to 1.7 million Zanzibaris in 2021, by 2060, this number is expected to increase to 3.4 million. Yet while the absolute population is increasing, the growth rates are projected to decline significantly over the coming four decades. In 2021, Zanzibar attained a growth rate of 3.1 per cent. Following this, a steady decline is expected as illustrated in Figure 10. By 2060, the country will witness

an average annual population growth rate of 1.1 per cent.

The effects of a growing population are also seen when considering the number of individuals per square kilometre (the population density), as well as their rural-to-urban distribution. Given Zanzibar’s finite area of 2,461 km², its population density will increase from a current ratio of 597 individuals per square kilometre to one of 1,373 individuals per square kilometre by 2060 under the high population growth scenario. This increase in density will most obviously be felt in the urban areas, given that by 2048 more than half of the population will live in urban centres, reaching a proportion of 52.6 per cent by 2060. In this scenario, a projected total of roughly 1.8 million individuals will be living in urban centres and 1.6 million in rural areas (see Figure 11).

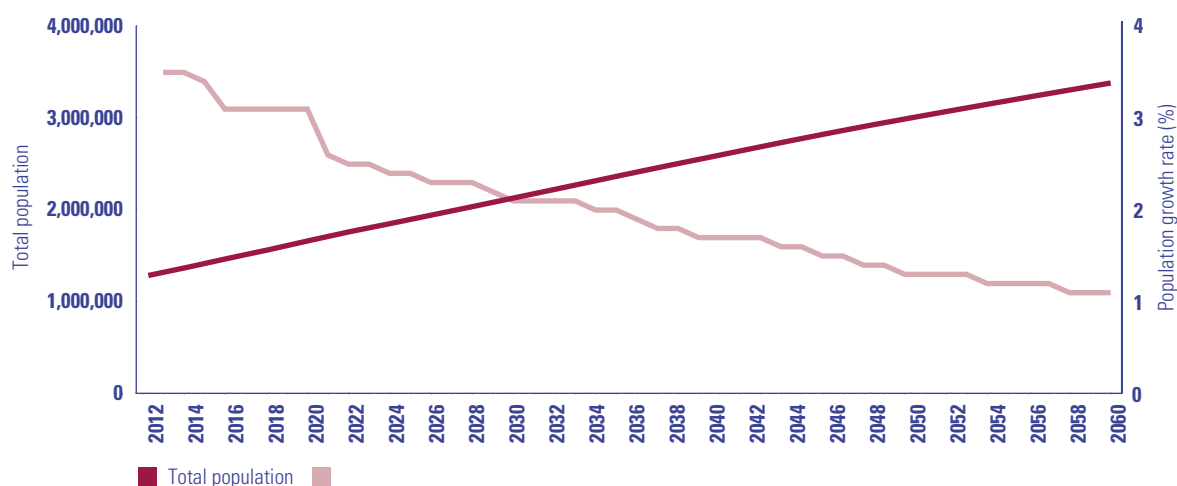


Figure 10: Zanzibar’s total projected population and annual projected population growth rate under the high population growth scenario

Source: Author’s calculations based on assumptions in NBS and OCGS, 2018.

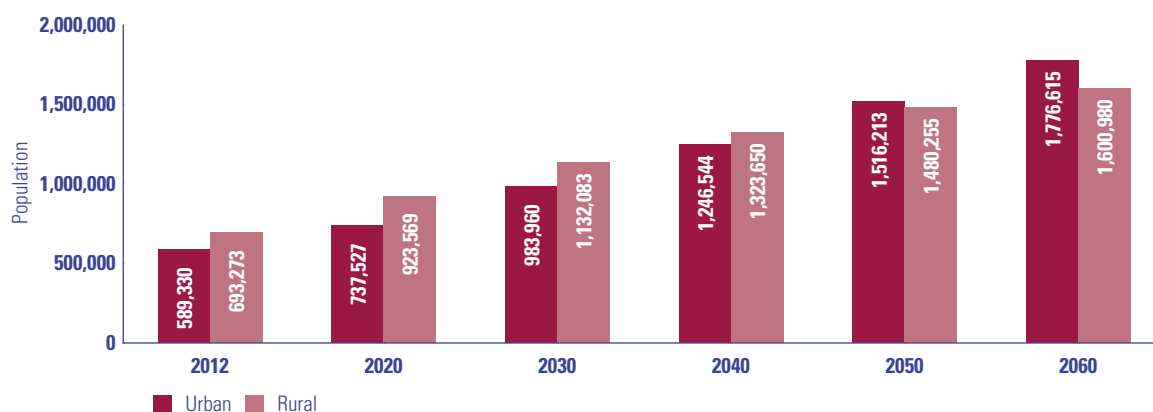


Figure 11: Zanzibar’s total rural and urban population projected under the high population growth scenario

Source: Author’s calculations based on assumptions in NBS and OCGS, 2018.

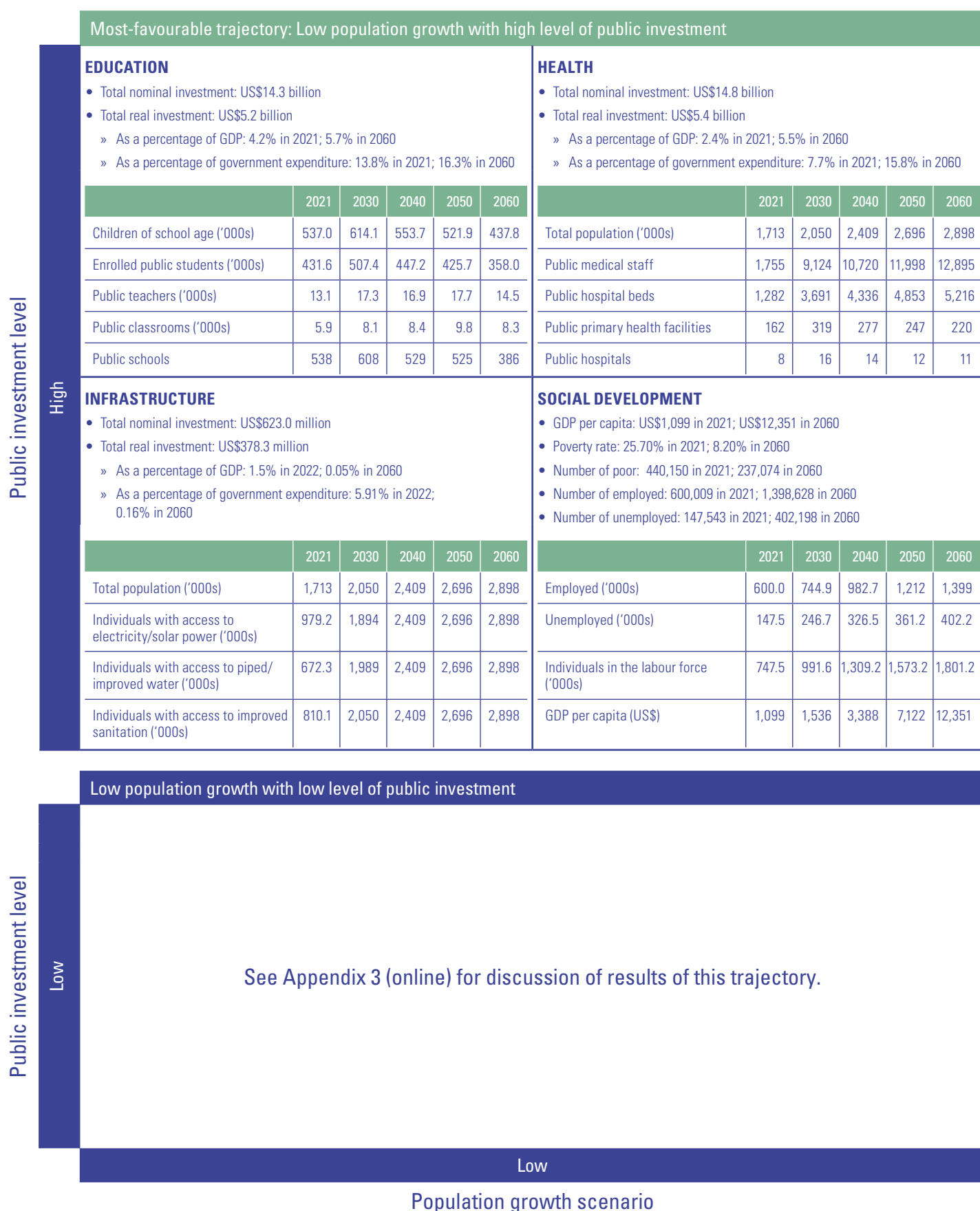


Figure 12: Summary results per sector, scenario and level of public investment (2021–2060)

Source: Author, based on author's calculations.

Note: Nominal values refer to the current value of the investment without taking inflation into account. Real values refer to the nominal value of the investment, yet is adjusted for inflation over time.

High population growth with high level of public investment

Public investment level

High

See Appendix 3 (online) for discussion of results of this trajectory.

Status-quo trajectory: High population growth with low level of public investment

Public investment level

Low

EDUCATION

- Total nominal investment: US\$7.0 billion
- Total real investment: US\$2.7 billion
 - » As a percentage of GDP: 4.2% in 2021; 2.5% in 2060
 - » As a percentage of government expenditure: 13.8% in 2021; 7.3% in 2060

	2021	2030	2040	2050	2060
Children of school age ('000s)	537.0	648.6	652.1	661.5	632.4
Enrolled public students ('000s)	431.6	536.2	536.0	545.5	521.0
Public teachers ('000s)	13.1	16.4	16.4	16.7	16.1
Public classrooms ('000s)	5.9	7.3	7.3	7.5	7.2
Public schools	538	674	673	687	659

HEALTH

- Total nominal investment: US\$2.9 billion
- Total real investment: US\$1.2 billion
 - » As a percentage of GDP: 2.4% in 2021; 0.9% in 2060
 - » As a percentage of government expenditure: 7.7% in 2021; 2.7% in 2060

	2021	2030	2040	2050	2060
Total population ('000s)	1,713	2,116	2,570	2,997	3,378
Public medical staff	1,755	2,169	2,634	3,071	3,462
Public hospital beds	1,282	1,642	1,994	2,325	2,621
Public primary health facilities	162	207	252	294	331
Public hospitals	8	10	12	15	16

INFRASTRUCTURE

- Total nominal investment: US\$348.0 million
- Total real investment: US\$162.6 million
 - » As a percentage of GDP: 0.35% in 2022; 0.07% in 2060
 - » As a percentage of government expenditure: 1.39% in 2022; 0.19% in 2060

	2021	2030	2040	2050	2060
Total population ('000s)	1,713	2,116	2,570	2,997	3,378
Individuals with access to electricity/solar power ('000s)	979.2	1,227	1,512	1,789	2,045
Individuals with access to piped/improved water ('000s)	672.3	856.9	1,074	1,294	1,502
Individuals with access to improved sanitation ('000s)	810.1	1,013	1,245	1,470	1,677

SOCIAL DEVELOPMENT

- GDP per capita: US\$1,099 in 2021; US\$4,976 in 2060
- Poverty rate: 25.70% in 2021; 12.76% in 2060
- Number of poor: 440,150 in 2021; 431,079 in 2060
- Number of employed: 600,009 in 2021; 1,320,830 in 2060
- Number of unemployed: 147,543 in 2021; 649,250 in 2060

	2021	2030	2040	2050	2060
Employed ('000s)	600.0	737.1	927.7	1,123	1,321
Unemployed ('000s)	147.5	254.6	402.0	532.2	649.3
Individuals in the labour force ('000s)	747.5	991.7	1,329	1,655	1,970
GDP per capita (US\$)	1,099	1,397	2,044	3,150	4,976

High

Population growth scenario

Note: The social development results represent those achieved when assuming that the economic variables reach the average indicators of African countries characterized as upper-middle-income countries by the end of the projection period. In addition to this, it must be noted that the health sector also analyses the impact that the fiscal investments, under the various trajectories, have on specific social indicators (neonatal, infant, child and maternal mortality rates). For a more detailed discussion of these impacts, please see Sections 3.1.3 and 3.2.3.

When considering Zanzibar's population disaggregated by age, an important shift in its structure is evident which provides an opportunity for economic growth:

the increase in the working-age population relative to the child and elderly population. It is projected that the working-age population (18–64-year-olds) for the high population growth scenario will increase from approximately 829,000 in 2021 to roughly 2.1 million in 2060 (see Figure 13). Simultaneously, the child population (0–17-year-olds) is expected to increase from 838,000 to 951,000 over the coming four decades. Furthermore, with increasing life expectancies due to investment in the coverage and quality of health care, not only does the working-age population grow, but so does the population that is aged 65 and over. It should be noted however, that while the working-age population increases by 154 per cent, the elderly population increases roughly four times as much.

The combination of the elderly and the youth populations relative to the working-age population will influence Zanzibar's total

dependency ratio. As seen in Figure 14, this ratio will drop significantly over the coming years. As a result, the number of children as a percentage of the entire population will decline by 20.7 percentage points over the coming four decades (see Table 3). Together with the increase in the elderly population, the total dependency ratio would thereby fall from a level of 106.7 in 2021 to 60.4 by 2060 (see Figure 14).

Table 3: Projected age proportion of population for the high population growth scenario

Year	0–17 years	18–64 years	65+ years
2020	48.8	48.5	2.7
2030	45.8	50.4	3.8
2040	38.0	56.9	5.1
2050	32.9	60.4	6.8
2060	28.1	62.4	9.5

Note: These numbers are also reflected as a graphical illustration in Figure 7.

Source: Author's calculations based on assumptions in NBS and OCGS, 2018.



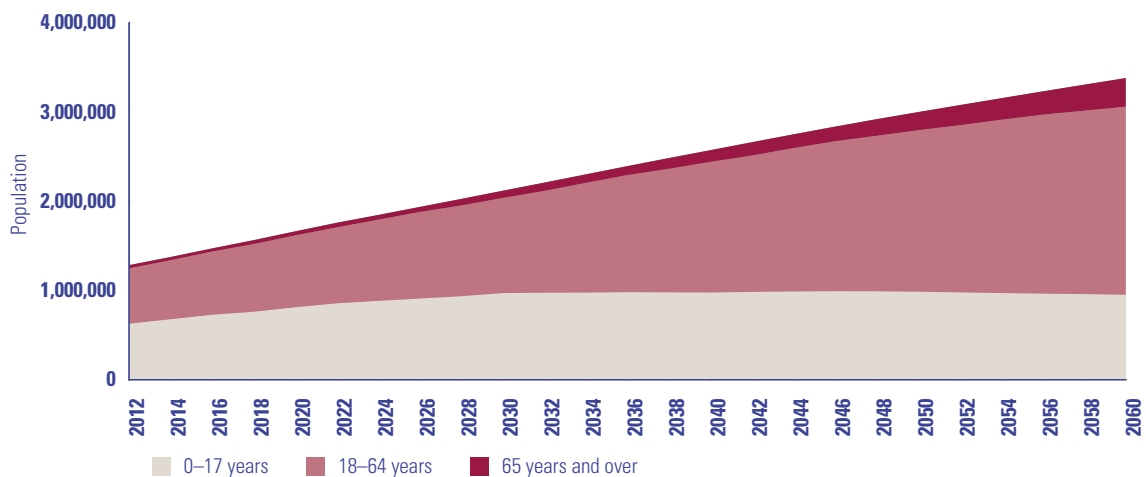


Figure 13: Total projected population by age-group for the high population growth scenario

Source: Author's calculations based on assumptions in NBS and OCGS, 2018.

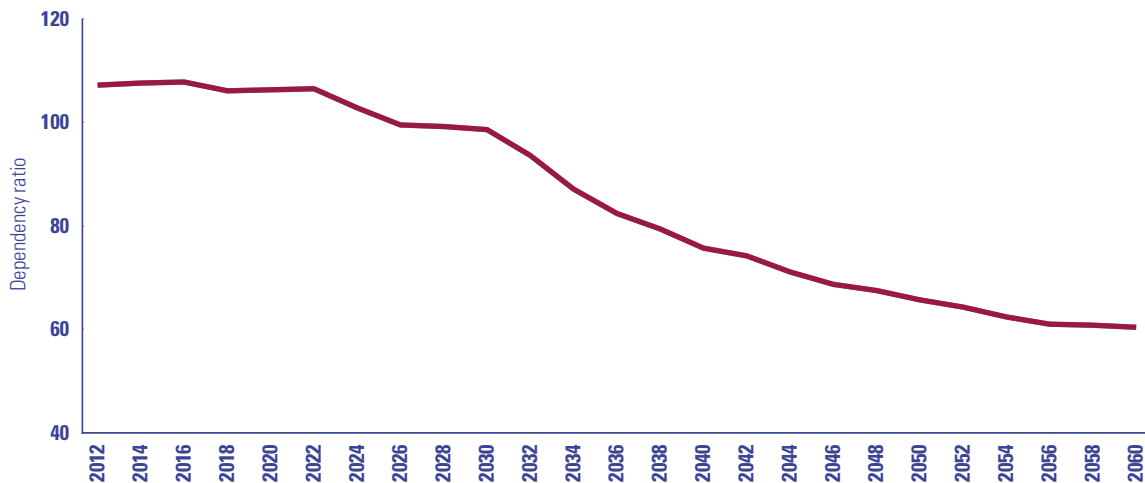


Figure 14: Projected dependency ratio for the high population growth scenario

Source: Author's calculations based on assumptions in NBS and OCGS, 2018.

Having identified a potential future path of population growth for the high population growth scenario, it must once again be highlighted that the subsequent sectoral results reflect the status-quo trajectory that the RGoZ could continue to follow in the coming four decades (see Figure 12). This trajectory would imply that population growth rates remain relatively high with little being done by the government to curb them over time – as outlined in Figure 10. Furthermore, the current levels of social indicators would be maintained given the low levels of public sectoral investment. For simplicity and to avoid confusion, the results related to high levels of public investment under the high population growth scenario are depicted in Appendix 3 (online).

3.1.2 Education

Current situation

While basic education has been compulsory and free since 1964, it was extended and restructured in 2019 to include basic secondary education, thus requiring each child to complete 12 years of schooling. This extension, in addition to the termination of parents' contributions five years ago, has led to a **steady improvement in enrolment over the past years in Zanzibar**. While pre-primary net enrolment in 2020/21 had attained the Zanzibar Education Development Plan II (ZEDP II) target of 50 per cent (MoEVT, n.d.), primary net enrolment was close to achieving its 100 per cent target.

However, secondary net enrolment, at 45.9 per cent in 2020/21, still remained significantly below its respective target of 80 per cent (OCGS, 2021a).

Nevertheless, this growth in enrolment has also led to challenges such as the shortage of resources and teachers. On average, the public pupil-to-teacher ratio was estimated at 40:1 in 2020/21. This is approximately twice the rate of roughly 17:1 exhibited in private schools (OCGS, 2021a). In addition, the public teachers are often underqualified. This is largely the case in pre-primary and primary education, where close to half or more of the public teachers are unqualified (82.7 per cent of pre-primary teachers and 48.6 per cent of primary teachers in 2018) (Annual Joint Education Sector Review Technical Working Group, 2019). These factors lead to discrepancies in the quality of education provided, as evidenced by pupils' higher average test scores across all subjects in private schools compared to those in public schools.

In addition to this, the education sector in Zanzibar is challenged by student dropout, although the rates have been declining over time. For example, in secondary school, students are opting to repeat a year instead of dropping out of the education system. Consequently, 2021 dropout rates in Forms I and II were 9.9 per cent and 13.4 per cent, respectively. This was down from 13.6 per cent and 31 per cent in 2017 (OCGS,

2021a). More needs to be done to reduce dropout rates in Form III, however, where there was an increase of approximately 5 percentage points during the same time period, i.e., from 3.7 per cent in 2017 to 8 per cent in 2021. These trends and challenges equate to approximately 7.3 mean years of education (8.1 years for boys and 6.5 years for girls).¹⁴ This is still below the target levels required by international policies.

Fiscal implications

The following results will illustrate the consequences, both in terms of social outcomes and fiscal responsibilities, if current rates of enrolment, teacher-to-pupil ratios, pupil-to-classroom ratios and pupil-to-textbook ratios were to remain constant over the coming four decades. This, however, does not imply that no efforts are required from the RGoZ. On the contrary, maintaining the current level of social outcomes given a growing population over time will require considerable inputs. Figure 15 indicates the magnitude of Zanzibar's challenge if the population continues its status-quo trajectory, illustrating the projections of the school-age population of the high population growth scenario, if low levels of public investment are maintained. **Overall, it can be expected that an average of approximately 2,300 children will enter the public education system every year between 2021 and 2060.**

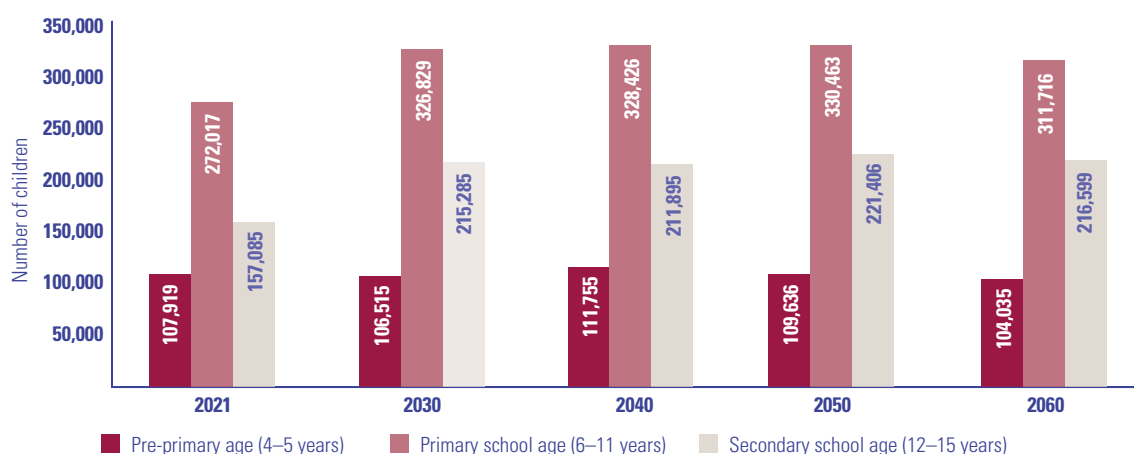


Figure 15: The projections of school-age children, by educational level for the high population growth scenario
Source: Author's calculations based on assumptions in NBS and OCGS, 2018, and in UNICEF and RGoZ, 2018a and 2021a.

¹⁴ These figures are based on the author's calculations based on data retrieved from the 2015/16 Tanzania Demographic and Health Survey and Malaria Indicator Survey.

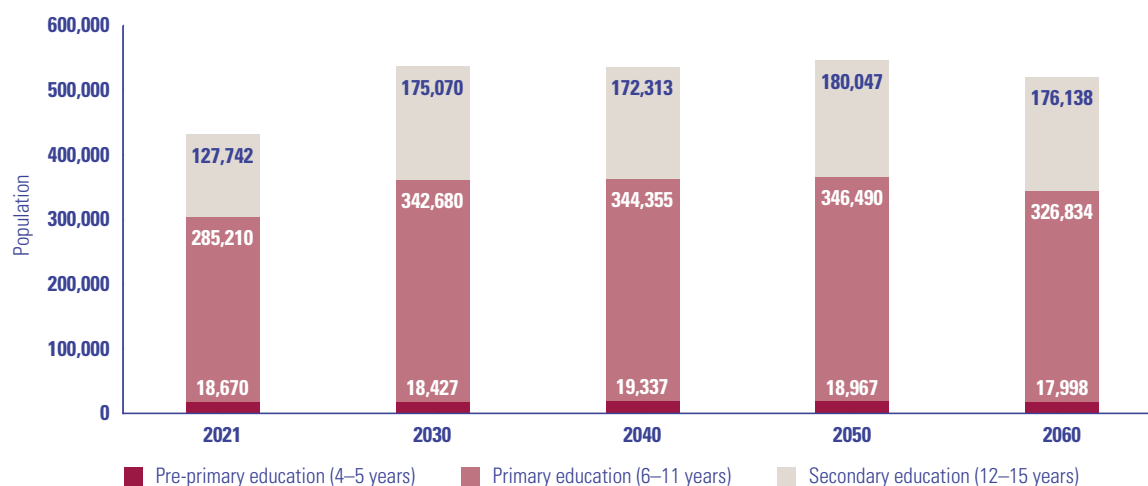


Figure 16: Gross public enrolment rates by education level for the high population growth scenario

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; UNICEF and RGoZ, 2018a and 2021a.

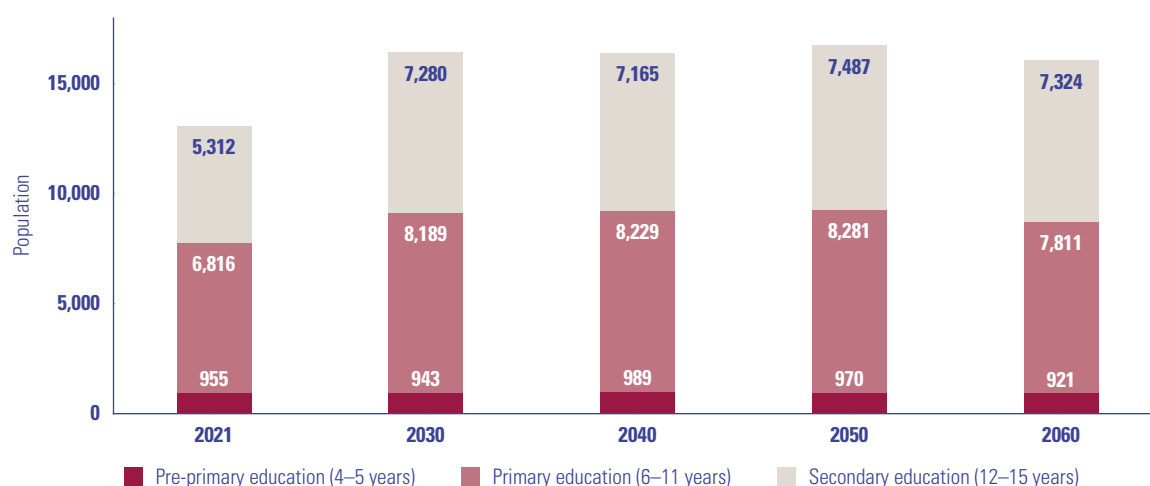


Figure 17: Total number of public teachers by education level for the high population growth scenario

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; UNICEF and RGoZ, 2018a and 2021a.

While absolute national public enrolment numbers in pre-primary education decline by 3.6 per cent as a result of a slowdown in population growth rates and constant public enrolment rates over the coming four decades, public primary education enrolment attains its peak in 2044 – rising by approximately 22 per cent from 2021, while declining by 6 per cent from 2044 until 2060. This equates to a decline in the number of public enrolled pre-primary students from roughly 19,000 in 2021 to 18,000 in 2060,

and an increase in public primary enrolled students from approximately 285,000 in 2021 to 349,000 in 2044, before declining to 326,000 by 2060 (see Figure 16).¹⁵ As a result, the number of public primary school teachers will need to increase from 6,816 in 2021 to 8,342 in 2044, before declining to 7,811 by 2060. **On average, this translates into an additional 67 public primary teachers per year being added to the government payroll between now and 2044** (see Figure 17). This is below the annual average of 315 public teachers

¹⁵ It needs to be noted that these numbers do not match the numbers presented in Figure 15 given that for low levels of public investment in the high population growth scenario, the current enrolment rates are kept constant over time. For pre-primary and secondary education, gross enrolment rates therefore remain below 100 per cent, while primary education gross enrolment is over 100 per cent. The latter implies that there currently are and will continue to be pupils in primary education that are above or below the specified age bracket of 6–11 years.

“ Overall, it can be expected that an average of approximately 2,300 children will enter the public education system every year between 2021 and 2060.

that have been hired over the past decade (OCGS, 2015, 2021b).

Similarly, public enrolment at the secondary level is projected to peak in 2033. Given the 128,000 public students in 2021, population growth rates resulting in constant public secondary enrolment rates will drive this number up to 182,500 by 2033. This equates to an overall increase of 42.9 per cent. Consequently, the number of secondary teachers will need to increase from 5,312 in 2021 to 7,590 by 2033 – an additional annual average of 190 public secondary teachers. If this does not occur, the current pupil-to-teacher ratio will not be maintained but will deteriorate as a result of the growth in secondary enrolment due to the growing trend in Zanzibar's population.

In order to maintain a constant public pupil-to-classroom ratio given the growing number

of students enrolled, the RGoZ will need to construct 26 additional public pre-primary school classrooms, 787 public primary school classrooms and approximately 874 public secondary school classrooms within the coming two decades.

However, given limited improvements in access over time, the slowdown in population growth will eventually result in a number of these classrooms becoming defunct. For public pre-primary education, this will happen from 2026 onwards, for public primary education from 2045 onwards, and for public secondary education from 2034 onwards if current classroom-to-pupil ratios are maintained (see Figure 18).

When it comes to books, a constant pupil-to-textbook ratio over time will require an increase of textbooks, especially during the first decade, given the higher population growth rates during these years. On average, the annual number of public pre-primary, primary and secondary textbooks will need to increase by 4; 327; and 702, respectively, until the maximum number of public enrolled students per education level is attained in 2025 for public pre-primary, 2044 for public primary, and 2033 for public secondary.

Although Zanzibar is faced with constant access and quality indicators and a declining, yet relatively high population growth rate under the status-quo trajectory, the RGoZ will still need to invest heavily in order to avoid deterioration in key social outcomes. In nominal terms, this would imply an increase in the education budget from US\$84.4 million in 2021 to US\$386.4 million in 2060 (see Figure 19). Yet, when accounting for inflation,

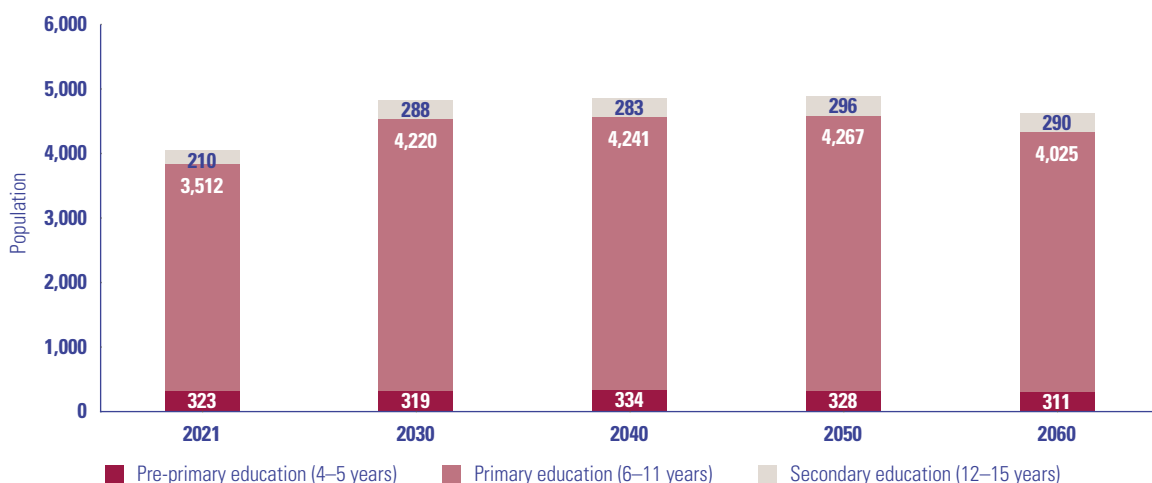


Figure 18: Total number of classrooms by education level for the high population growth scenario

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; and UNICEF and RGoZ, 2018a and 2021a.

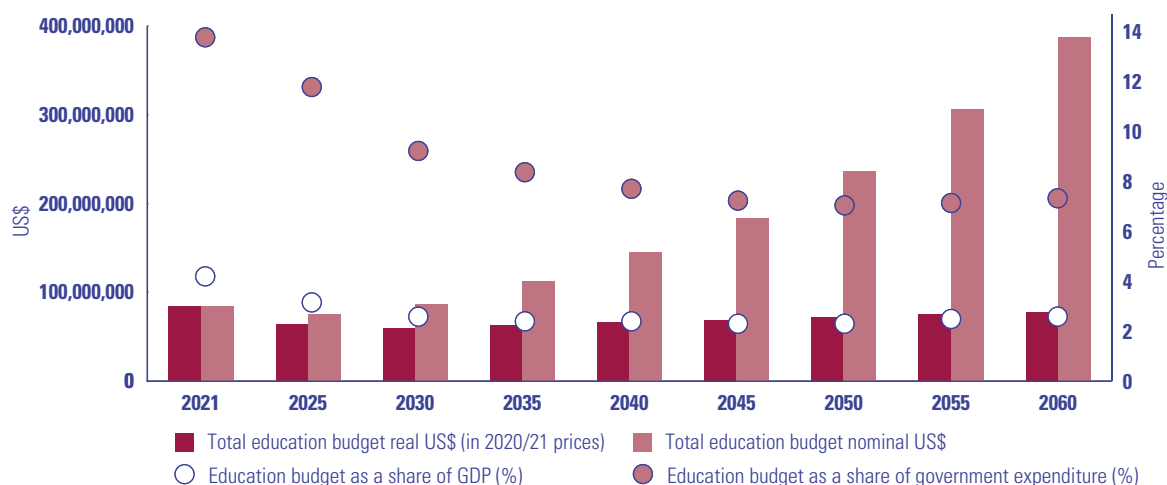


Figure 19: Projected nominal and real education budget, in absolute terms and as a percentage of GDP and government expenditure under the status-quo trajectory

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; UNICEF and RGoZ, 2018a and 2021a.

the GDP growth rate and the nominal education budget growth rate, the real education budget declines – from US\$84.4 million in 2021 to US\$77.7 million in 2060 (see Figure 19). This is due to the growth rate of GDP as well as because inflation is projected to remain above the nominal growth rate of the education budget over time.

This would equate to a total nominal investment of roughly US\$7 billion and a real investment of US\$2.7 billion over the coming 39 years. In terms of real expenditure per enrolled student at 2020/21 prices, a similar decline is witnessed, from US\$195 to US\$149 between 2021 and 2060. As a percentage of GDP and government expenditure, this equates to 4.2 per cent and 13.8 per cent in 2021 and 2.5 per cent and 7.3 per cent in 2060, respectively. Yet once again, it is important to highlight that under the status-quo trajectory, Zanzibar would not achieve United Nations Educational, Scientific and Cultural Organization's (UNESCO's) Education 2030 Framework for Action, or the targets outlined in the country's Development Vision 2050 or its Education Development Plan II. As a result, the current challenges faced today will remain. These challenges include subpar enrolment rates, high dropout rates, shortages of learning materials, as well as low quality education (Annual Joint Education Sector Review Technical Working Group, 2019).

3.1.3 Health

Current situation

Over the past decade, Zanzibar has seen improvements in specific areas of its health sector, including the prevalence of testing for malaria, the prevalence of treatment of HIV, the early detection of leprosy, the early initiation of breastfeeding, the proportion of households with improved sanitation facilities and the coverage of eye surgery, amongst others (MoH, 2017). Yet despite these investments, Zanzibar's health sector continues to face significant challenges, especially where children and women are concerned (see Table 4). In 2021, neonatal, infant and under-five mortality equated to 29, 46 and 67 deaths per 1,000 live births, respectively, and maternal mortality stood at 307 deaths per 100,000 live births. Severe acute malnutrition, along with high rates of stunting and wasting (21.5 per cent and 6.1 per cent, respectively) are the leading causes of death among children. The high rate of maternal mortality is caused mainly by anaemia and exacerbated by 60 per cent of mothers failing to have postnatal check-ups in the first two days after birth (UNICEF and RGoZ, 2021b). In addition to this, Zanzibar still exhibits difficulties in relation to the cure rate of tuberculosis, HIV testing in pregnant women, the screening for HIV among tuberculosis patients, as well as nutrition-related indicators (MoH, 2017).

These challenges are exacerbated by severe shortages of skilled health-care workers, especially in rural and remote areas of the country.

In 2020/21, Zanzibar had fewer than one physician and approximately four to five nurses per 10,000 individuals. This resulted in a third of birth deliveries that were not attended by a skilled health professional. In combination with shortages of medicines and a suboptimal state of facilities and health technologies, it is clear that the present available resources are not sufficient to ensure the full provision of free quality health services for all individuals on Zanzibar. To achieve this, the present expenditure on health would need to increase from 2.4 per cent of GDP and 7.7 per cent of government expenditure (UNICEF and RGoZ, 2021b). Yet based on recent trends, it is unlikely that the targets set out in the Abuja Declaration will be achieved. The fiscal implications of this on certain health outcomes are analysed in the following subsection.

Table 4: Health indicators for Zanzibar

Indicator	Value	International target
Life expectancy at birth (2018)	68 years	–
Infant mortality rate per 1,000 live births (2016)	25.4 deaths	12 deaths
Under-5 mortality rate per 1,000 children (2016)	67 deaths	25 deaths
Maternal mortality rate per 100,000 births (2018)	155 deaths	70 deaths
Wasted children under the age of 5 (2015/16)	6.1%	Less than 5%
Stunted children under the age of 5 (2018)	21.5%	Reduction by 40% of 2012 value
Births attended by skilled health personnel (2015/16)	69%	–
Full immunization coverage at under 1 year (2018)	78.1%	–

Source: UNICEF and RGoZ, 2018b and 2021b

Fiscal implications and impacts on health outcomes

In the status-quo trajectory, the analysis aims to quantify the fiscal implications of population growth on essential health services, as well as on overall health services provided. It assumes that Zanzibar will not achieve the target set out in the Abuja Declaration, which stipulates that Member States of the African Union should allocate at least 15 per cent of their annual national budgets to improving their health-care systems. Yet even if it does not achieve this, **the RGoZ will still need to invest considerably in a number of physical inputs in order to maintain the present level of essential and overall health-care coverage, given the addition of, on average, 66,000 individuals per year between 2021 and 2060.** This represents an increase in the total population from roughly 1.7 million in 2021 to roughly 3.4 million in 2060 (see Figure 10). Consequently, Zanzibar would need to hire an additional 1,707 medical staff during the coming 39 years (equating to, on average, 44 staff per year) to maintain the current Universal Health Coverage Index (see Figure 20).¹⁶

Furthermore, the analysis projects that an additional 233 beds across all primary health facilities, and a total of 1,106 additional beds across secondary and tertiary public health facilities will be needed in order to maintain the current public-bed-to-population ratio (see Figure 20). With the required increase in both beds and medical staff as a result of population growth rates, Zanzibar will need to construct an additional 169 primary health facilities and eight secondary and tertiary hospitals during the next four decades. This represents a doubling of the facilities compared to the current number of health facilities (see Figure 21). This would translate to constructing, on average, 42 primary health facilities and two hospitals per decade. While the latter is in line with the number of hospitals built in the past decade, the former (primary health facilities) represents an increase from the 24 primary health facilities built between 2011 and 2021. This is the result of

¹⁶ In comparison, Zanzibar has hired an annual average of 148 medical staff, both public and private, in the past eight years (OCGS, 2015, 2021b).

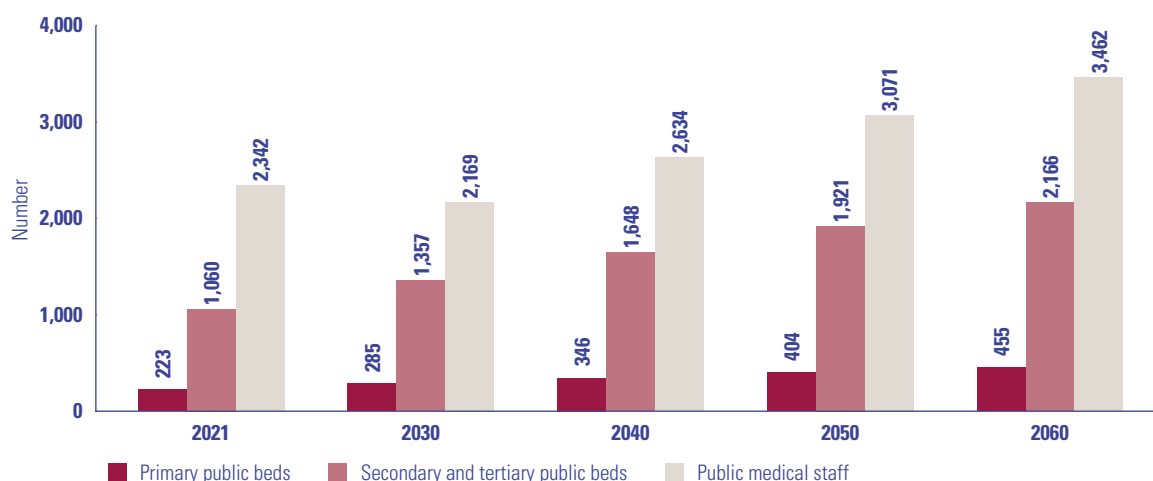


Figure 20: Total number of medical staff and public hospital beds required under the status-quo trajectory
Source: Author's calculations based on assumptions in NBS and OCGS, 2018; UNICEF and RGoZ, 2018b and 2021b.

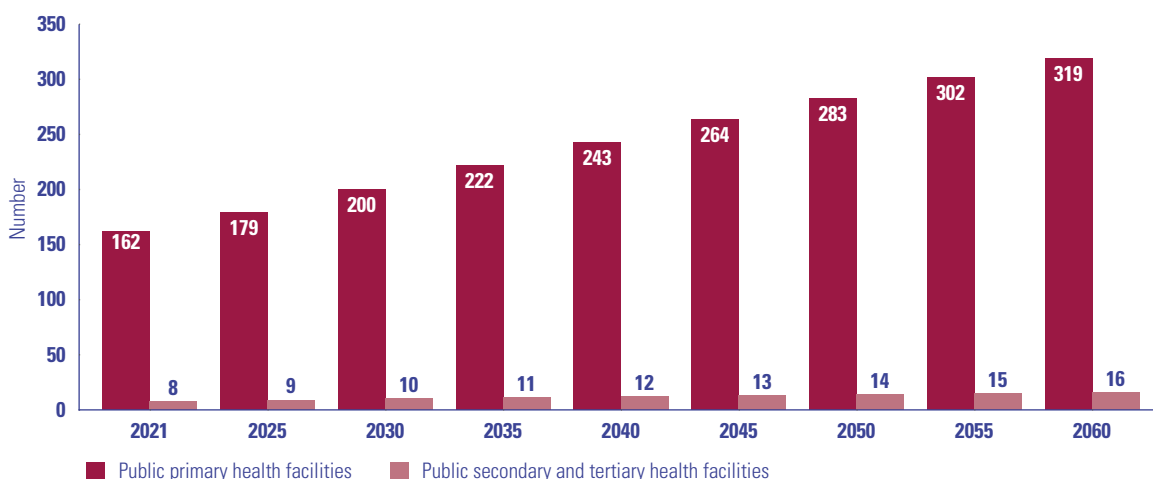


Figure 21: Total number of primary, secondary and tertiary health facilities required under the status-quo trajectory
Source: Author's calculations based on assumptions in NBS and OCGS, 2018; UNICEF and RGoZ, 2018b and 2021b.

an increasing population along with maintaining constant medical staff numbers and beds per 10,000 individuals. Yet, if any future primary health facilities or secondary and tertiary hospitals were to be larger, this number could be reduced.

In order to sustain current access and quality levels, the total nominal budget related to overall health care will need to increase considerably from US\$47.3 million in 2021 to US\$144.8 million in 2060. In real terms (2020/21 prices), this equates to US\$29.1 million in 2060 (see Figure 22). When considering only public essential services, the total nominal budget will increase from US\$38 million in 2021 to US\$116.2 million in 2060. In

real terms (2020/21 prices), this equates to US\$23.4 million in 2060 (see Figure 23).

Aggregating the nominal essential service expenditure and the overall health expenditure over time, this equates to a total nominal investment of US\$2.3 billion and US\$2.9 billion, respectively. The equivalent in real terms (2020/21 prices), would be US\$965.7 million and US\$1.2 billion respectively. In terms of the overall real health budget, this equates to a real per capita decrease from US\$28 (2021) to US\$9 (2060); a decline as a percentage of GDP from 2.4 per cent (2021) to 1 per cent (2060); and a decline in government expenditure from 7.7 per cent (2021) to 2.7 per cent (2060).

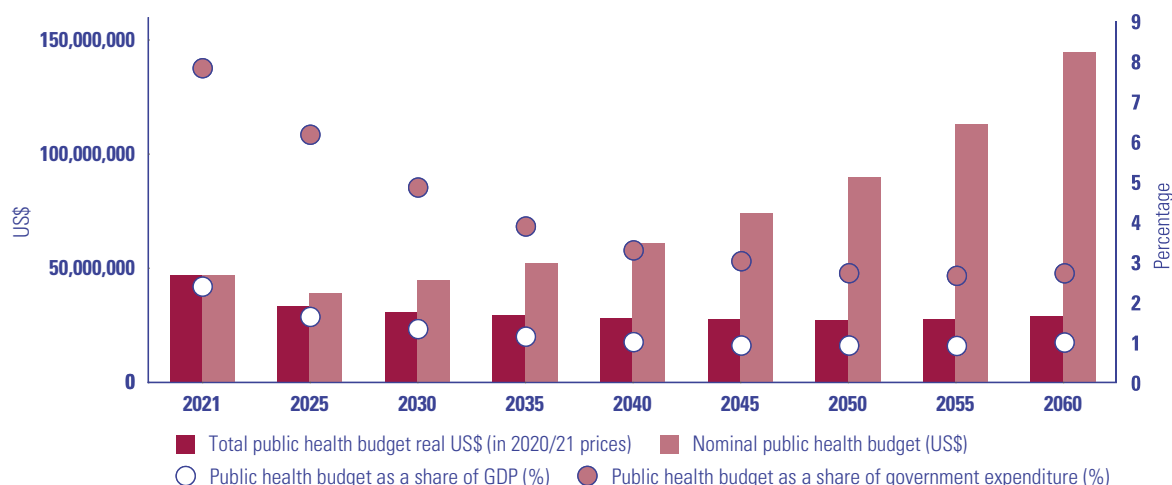


Figure 22: Projected nominal and real overall health budget, in absolute terms and as a percentage of GDP and government expenditure under the status-quo trajectory

Source: Author’s calculations based on assumptions in NBS and OCGS, 2018; UNICEF and RGoZ, 2018b and 2021b.

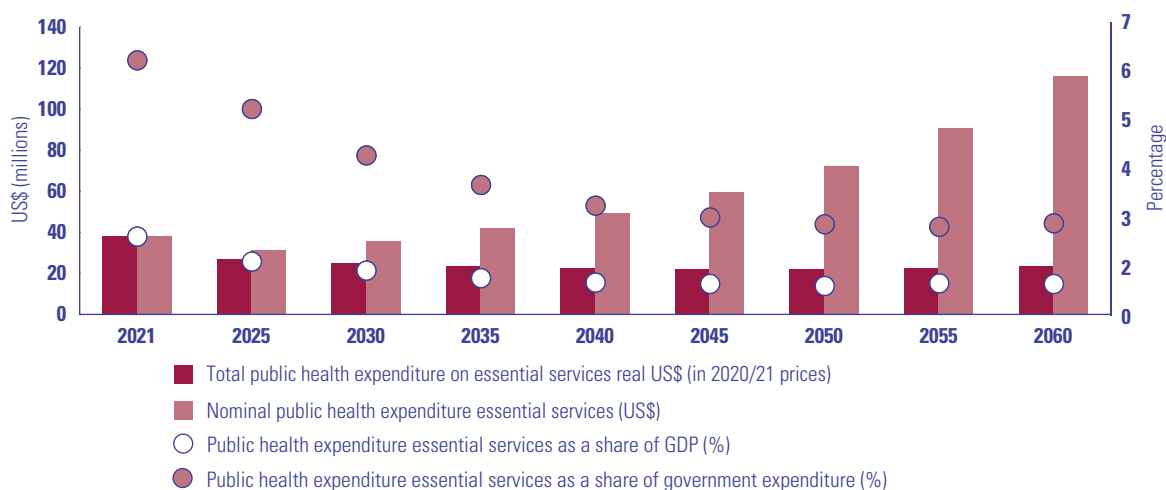


Figure 23: Projected nominal and real health budget for essential services, in absolute terms and as a percentage of GDP and government expenditure under the status-quo trajectory

Source: Author’s calculations based on assumptions in NBS and OCGS, 2018; UNICEF and RGoZ, 2018a and 2021a.

In line with the projected spending, the analysis has also been able to generate projections for key health outcome indicators on neonatal, infant, under-five and maternal mortality rates.¹⁷ **In each of the four outcomes, mortality rates will decrease, albeit more so for the mortality rates of children than those of mothers** (see Figure 24). With no change in the current access and quality of health care over

time, neonatal mortality will only decrease from 29 deaths in 2021 to 25 deaths per 1,000 live births in 2060. Similar trends will be seen for infant and under-five mortality, which will decline from 46.4 deaths and 67.4 deaths in 2021, to 42 deaths and 62 deaths per 1,000 live births in 2060, respectively. **Consequently, an annual average of 5,113 infants and 18,849 children under the age of 5 will pass**

17 The generated projections for key health outcomes are based on two components: (i) the correlation between each health outcome and health expenditure, and (ii) the projected health expenditure. The first component is an average of the correlations found in literature on African countries. This correlation was then assumed to remain constant over time. This in addition to the projected health expenditure allowed the methodology to assess the impact of these projections on the key health outcomes.

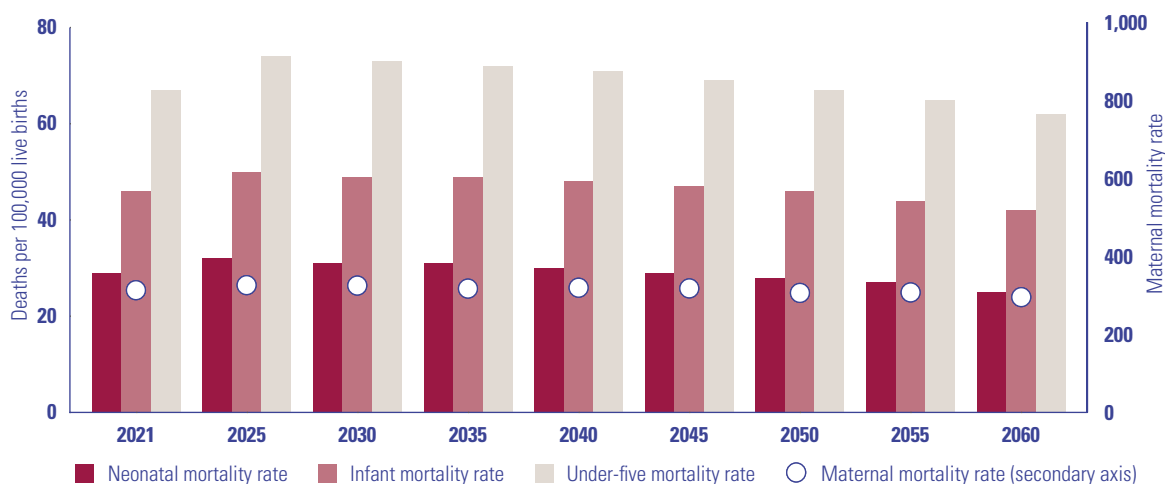


Figure 24: Projections in health outcomes under the status-quo trajectory

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; UNICEF and RGoZ, 2018a and 2021a and relevant literature.

away. Furthermore, maternal mortality is projected to decline slowly – from 307 deaths per 100,000 live births to 290 deaths.

3.1.4 Infrastructure

Current situation

In recent years, Zanzibar has prioritized the generation of enabling infrastructure for the development of the energy, water and sanitation infrastructure. To date, less than 81 per cent of urban individuals and less than 39 per cent of rural individuals have access to electricity/solar power, while piped and improved water are only available to roughly 74 per cent of urban individuals and 10 per cent of rural individuals. Roughly 64 per cent of urban individuals, but only 34.1 per cent of rural individuals, have access to improved sanitation. In order to universalize access to these services, the RGoZ needs to overcome a number of challenges.

In terms of energy, this would require investing into the generation of its own electricity as currently the country depends on imports from Mainland Tanzania through the use of submarine cables. As a consequence, Zanzibar is highly dependent on the correct functioning of these cables. Any supply outages can have significant negative impacts on Zanzibar's economy. Furthermore, the demand for electricity is growing by

an average of 8 per cent per year due to the country's economic growth and the rapid expansion of the tourism sector. Previously conducted projections by the World Bank conclude that demand will exceed available capacity by 2022 (World Bank, 2019).

In terms of water, Zanzibar is currently facing critical water shortages throughout the country. According to ZAWA, the country needs more than 200 million litres of fresh water per day for its entire population, but only roughly 50 per cent of this requirement is available (African Development Fund, 2020). This places a burden on many Zanzibari households, especially women and children, as they are forced to go out and look for fresh water. To counteract this, significant investment would be required to repair or replace the dilapidated infrastructure, (e.g., leaking pipes), while alternative sources of fresh water need to be found, given the decline in water supply from natural sources. To date, a number of measures have been introduced to lessen the burden on the population and to increasingly provide more fresh water for its people. These include the protection of the environment close to natural sources of water; the construction of boreholes and wells; the minimization of water wastage through the introduction of consumption meters; as well as improved infrastructure (African Development Fund, 2020). Nevertheless, further efforts are still required.

Fiscal implications

Under the status-quo trajectory, nominal costs of the extension of infrastructure are expected to rise over time given the growing population as well as an increase in rural-to-urban migration rates. With constant access rates to electricity, water and sanitation infrastructure, a total of roughly 815,000 urban Zanzibaris will require access to electricity/solar power; approximately 763,000 will need piped water; and a little under 645,000 will require improved sanitation systems during the coming four decades. In terms of the rural population, a much more moderate need is predicted – with an additional 250,000 individuals needing to be connected to electricity/solar power, roughly 67,000 needing improved water, and 223,000 needing improved sanitation. This is largely attributed to the increased rural-to-urban migration that will take place over time. The absolute numbers of the population that will be covered by each of these three services in five-year brackets up to 2060, are illustrated in Table 5. **Overall, it can be concluded that an additional annual average of 27,326 individuals will have access to electricity/solar power; 21,273 to piped/improved water; and 22,238 to improved sanitation between 2021 and 2060.**

In total, the inclusion of the additional individuals to the electricity/solar grid over the

next 39 years under the status-quo trajectory would cost US\$77.3 million in nominal terms – from a value of US\$7.3 million in 2021 to US\$10.3 million in 2060. In real terms (2020/21 prices), this would equate to US\$31.3 million over the four decades – or an average of approximately US\$803,000 a year given the cost assumptions outlined in Chapter 2. The real financial burden will be higher in urban areas (US\$21.7 million) given that more cost-efficient energy solutions are available in rural areas, (solar power or other renewable energy sources).

In terms of water infrastructure, the government will have spent, in real terms, US\$47.3 million on the extension by 2060 – US\$45.8 million in urban areas and US\$1.5 million in rural areas. In nominal terms, this would equate to a total of US\$98 million. **Finally, in terms of improved sanitation, a total of approximately 1.68 million individuals will have access by 2060, costing the RGoZ a total of US\$84 million in real terms –** or US\$74.2 million for urban areas and US\$9.8 million for rural areas.

Combined, the extension of infrastructure for a growing population in current access rates will amount to a total nominal value of US\$348 million and a total real value of US\$162.6 million. As a percentage of annual GDP and annual government expenditure, this will equate to approximately 0.16 per cent and 0.57 per cent, respectively (see Figure 27).

Table 5: Urban and rural populations with access to electricity, water and sanitation under the status-quo trajectory, 2021–2060

	Electricity/solar power		Piped/improved water		Improved sanitation services	
	Urban	Rural	Urban	Rural	Urban	Rural
2021	614,892	364,342	575,554	96,778	486,185	323,923
2025	690,450	396,100	646,278	105,214	545,927	352,158
2030	792,088	434,720	741,414	115,472	626,291	386,493
2035	896,835	472,839	839,460	125,598	709,113	420,384
2040	1,003,468	508,282	939,271	135,012	793,425	451,894
2045	1,112,115	541,217	1,040,967	143,761	879,330	481,176
2050	1,220,551	568,418	1,142,466	150,986	965,070	505,359
2055	1,325,113	592,903	1,240,339	157,490	1,047,745	527,128
2060	1,430,175	614,776	1,338,679	163,300	1,130,815	546,575

Source: Author's calculations based on assumptions in NBS and OCGS, 2018.

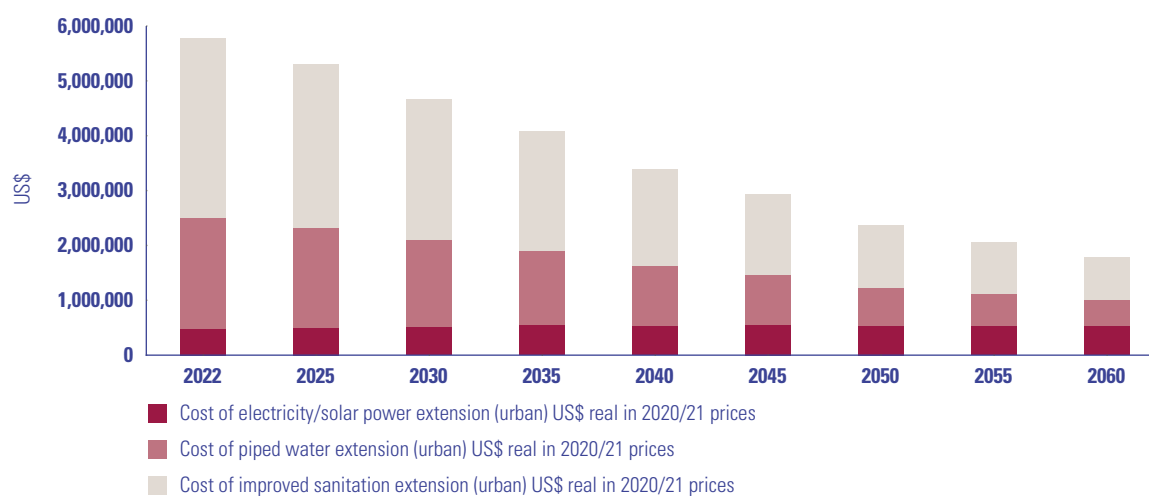


Figure 25: The real costs of improved electricity, water and sanitation extension to urban areas under the status-quo trajectory (2020/21 prices)

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; as well as assumptions regarding extension costs retrieved from World Bank, 2019; and Hutton and Varughese, 2016.

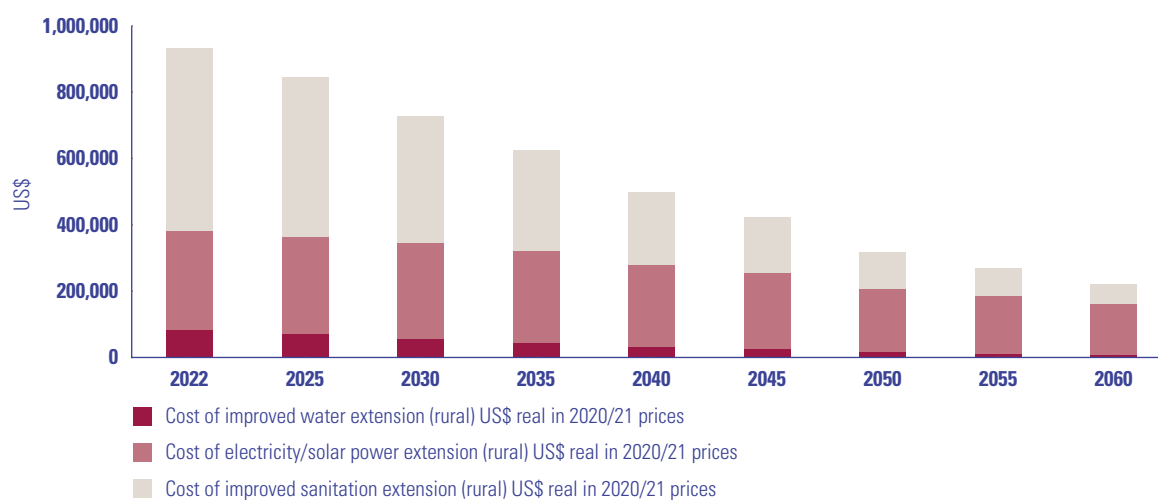


Figure 26: The real costs of improved electricity, water and sanitation extension to rural areas under the status-quo trajectory (2020/21 prices)

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; as well as assumptions regarding extension costs retrieved from World Bank, 2019; and Hutton and Varughese, 2016.

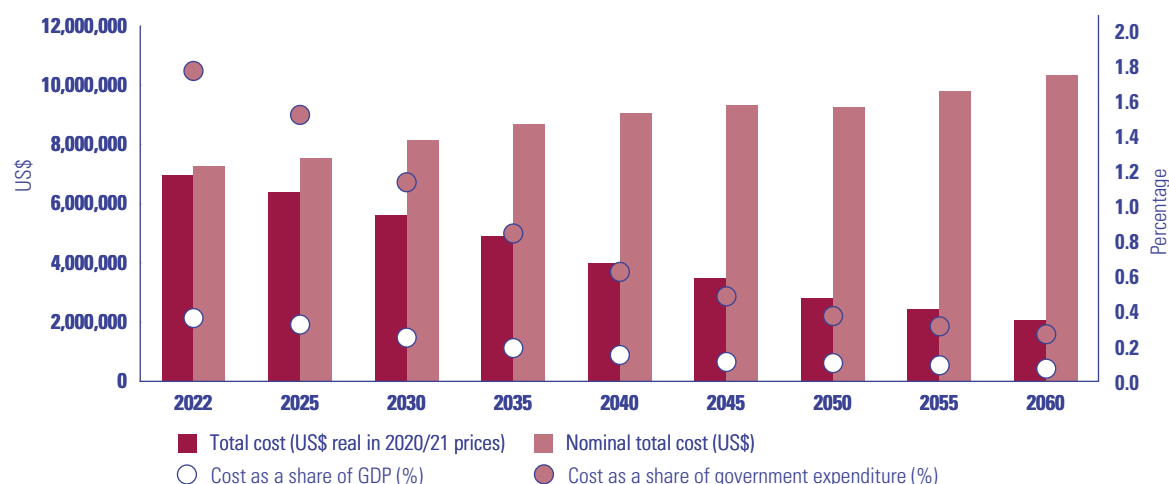


Figure 27: Projected nominal and real infrastructure budget, in absolute terms and as a percentage of GDP and government expenditure under the status-quo trajectory

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; as well as assumptions regarding extension costs retrieved from World Bank, 2019; and Hutton and Varughese, 2016.

3.1.5 Social development

Current situation

Zanzibar is in its second stage of demographic transition. One of the main challenges that the RGoZ will face during the following four decades is to ensure that the growing working-age population, especially the youth, will have access to productive labour market opportunities. This has proved to be a difficult undertaking in the past. With a rapidly expanding population, along with high rates of fertility and limited job creation, unemployment has been a pressing socioeconomic problem. While the national unemployment rate stood at 5.5 per cent in 2006, this increased to 19.6 per cent in 2021 (NBS and OCGS, 2021; OCGS, 2016, n.d.). The age group 15–24 years experienced the highest rate of unemployment (33.6 per cent). Furthermore, females were more likely to be unemployed than their male counterparts (29.6 per cent women compared to 10.3 per cent men in 2021). In addition to this, rural rates of unemployment were lower than those in urban areas.

Labour force participation rates have also fallen from a level of 83.4 per cent in 2006 to 76 per cent in 2021. Geographically, rural areas accounted for a higher rate of participation than urban centres (77.1 per cent compared to 74.8 per cent,

respectively) (NBS and OCGS, 2021). Compared to 2006, these rates have seen a significant decline (NBS and OCGS, 2021; OCGS, n.d.). Furthermore, women experienced lower access to productive jobs and wage employment and were therefore more likely than men to work in the informal sector, where employment conditions were less secure (World Bank, 2017).

In 2021, approximately 42 per cent of all those employed were engaged in the informal sector. This was an increase of roughly 43 per cent from the levels in 2006, with 49.4 per cent females employed in the sector, compared to 36.2 per cent males (NBS and OCGS, 2021; OCGS, 2016). This contributes to the wage differential between the two genders – i.e., the ratio of women's income to that of men was equivalent to approximately 88 per cent in 2021. Yet this represents a significant improvement from the 2014 level, where the proportion stood at 40 per cent. Wage employment remains rather limited in Zanzibar (roughly 28 per cent), illustrating the high dependence of Zanzibaris on agricultural and non-agricultural business income.

The labour market of Zanzibar requires a profound transformation given that under the current conditions, Zanzibar's labour market, including its large informal economy, does not generate enough employment to provide sufficient job opportunities for the growing

youth population. Without this transformation, the investment undertaken to generate a better educated and healthier workforce will result in suboptimal increases in productivity and value added to the Zanzibari economy. The growing youth population needs to be put to work productively. Therefore, investments are required that allow for a smooth transition to the labour market once education has been completed.

Implications

In the status-quo trajectory, **the number of new entrants to the labour market will remain relatively constant over the coming four decades at an annual average of approximately 18,500 individuals.** This, in addition to insufficient employment opportunities, will not reduce the current number of unemployed. Instead, at the current level of demographic and economic indicators (see Table 2), the proportion of the population aged 15 and over that are employed will decline from 61 per cent in 2021 to 51 per cent in 2060, while that of the unemployed will increase from 15 per cent in 2021 to 25 per cent in 2060. **In absolute terms, this implies that Zanzibar's employed and unemployed will increase by a total of 721,000 and 501,000, respectively, during the following four decades** (see Table 6). Considering youth, 44.4 per cent of the total unemployed (approximately 65,500 individuals) and 21.5 per cent of the total employed (approximately 129,000 individuals) were between the ages of 15 and 24 years in 2021. By 2060, these numbers will have increased to a

Investments are required that allow for a smooth transition to the labour market once education has been completed.



total of approximately 288,300 unemployed youth and 284,000 employed youth. Assuming that both proportions remain constant over time, **an additional 5,712 youth will be unemployed and an additional 3,974 will be employed between 2021 and 2060 annually.**

This increased unemployment, especially among the youth, can have long-lasting, negative impacts for individuals as well as for the country. Not only will they experience fewer opportunities to develop their careers, but they will also face lower wages, poorer job prospects, less access to social protection and ultimately lower pensions. In addition, lengthy unemployment and few job prospects will also increase the likelihood that these individuals will end up working in Zanzibar's informal economy. This is of concern for the country as it implies a larger share of individuals working in low productivity sectors, with resultant lower tax revenues and higher levels of poverty and inequality (Yu and Ohnsorge, 2019).

Table 6: The total employed and unemployed in thousands under the status-quo trajectory

	2021	2025	2030	2035	2040	2045	2050	2055	2060
Number of total employed ('000)	600	658	737	833	928	1,024	1,123	1,222	1,321
Percentage change	–	9.7	12.0	13.0	11.4	10.4	9.7	8.8	8.1
As a percentage of the population aged 15 and above	61.0	59.1	56.5	54.3	53.0	52.2	51.6	51.2	51.0
Number of youth employed ('000)	129	141	159	179	200	220	241	263	284
Number of total unemployed ('000)	148	188	255	333	402	468	532	592	649
Percentage change	–	27.0	35.6	30.6	20.7	16.4	13.7	11.3	9.6
As a percentage of the population aged 15 and above	15.0	16.9	19.5	21.7	23.0	23.8	24.4	24.8	25.0
Number of youth unemployed ('000)	66	84	113	148	179	208	236	263	288

Source: Author's calculations based on assumptions in NBS and OCGS, 2018, as well as on information retrieved from WEF, 2017; MoHCDGEC et al., 2016; and NBS and OCGS, 2021.

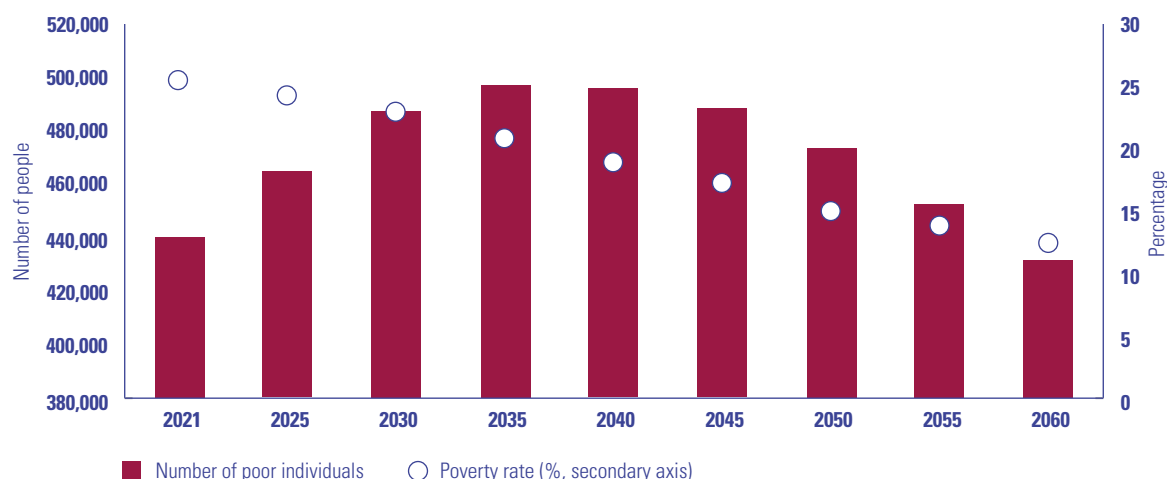


Figure 28: Projected poverty rate and the number of poor individuals under the status-quo trajectory

Source: Author's calculations based on assumptions in NBS and OCGS, 2018 as well as relevant literature.

“ If today's conditions in the labour market and the economy remain constant over time, Zanzibar will attain its upper-middle-income status by 2056.

Meanwhile, in the status-quo trajectory, the nominal GDP per capita is projected to increase from US\$1,099 in 2021 to US\$4,976 in 2060. Consequently, **if today's conditions in the labour market and the economy remain constant over time, Zanzibar will attain its upper-middle-income status by 2056** – six years after the intended target of the 2050 Development Vision. However, this improvement in per capita GDP does reduce the poverty rate and the number of poor individuals over time.

While in 2021 Zanzibar exhibited a rate of poverty equivalent to 25.7 per cent (440,000 individuals), it falls over time in line with the increase in GDP per capita. By 2060, only 12.8 per cent of the population will be below the national poverty line. Accounting

for the rate of population growth over time, this would total approximately 431,000 poor individuals (see Figure 28). This is in line with historical trends, yet at a slower rate. From 1992 to 2021, poverty reduced by a total of 35.3 percentage points – from 61 per cent in 1992 to 25.7 per cent in 2021 (RGoZ, 2007; World Bank, 2017).

3.2 The most-favourable trajectory: low population growth with high public investment

Having explained the fiscal and socioeconomic implications that arise in the sectors when following the status-quo trajectory (low levels of public investment and high population growth rates), this subsection aims to provide an indication of how these will change if the RGoZ implements population and family planning policies that allow for further reduction in the projected total fertility rate of the country by 0.5 births below the rates exhibited under the high population growth scenario. This would occur simultaneously with improvements in the access and quality of sectoral indicators over time (i.e., high levels of public investment).¹⁸ It could be described as the most-favourable trajectory for Zanzibar.

¹⁸ In line with the assumptions made by UNDESA (2019a), as well as in line with the World Bank's methodology used in Uganda (World Bank, 2020).

3.2.1 Population projections

Compared to the high population growth scenario, the low population growth scenario also sees an increase in Zanzibar’s population by 2060 albeit at a slower pace. While in the former the population reaches a total of just under 3.4 million by 2060, it reaches 2.9 million in the latter. This is a result of lower annual population growth rates resulting from overall lower total fertility rates. In the low population growth scenario, population growth rates are projected to decline significantly over the coming four decades, reaching 1.9 per cent in 2030, 1.4 per cent in 2040, 0.9 per cent in 2050, and 0.6 per cent in 2060 (see Figure 29).

The differences in the two scenarios are also evident when considering the number of individuals per square kilometre (population density), as well as their rural-to-urban distribution. In both instances, the numbers provided are lower for the low population growth scenario compared to the high population growth scenario as described in Section 3.1.1. As a result, by 2060, Zanzibar will have 1,177 individuals per square kilometre, with more than half of its population living in urban areas. This will result in a population distribution that is equivalent to 1.52 million Zanzibaris living in urban centres and roughly 1.37 million living in rural areas by 2060 (see Figure 30).

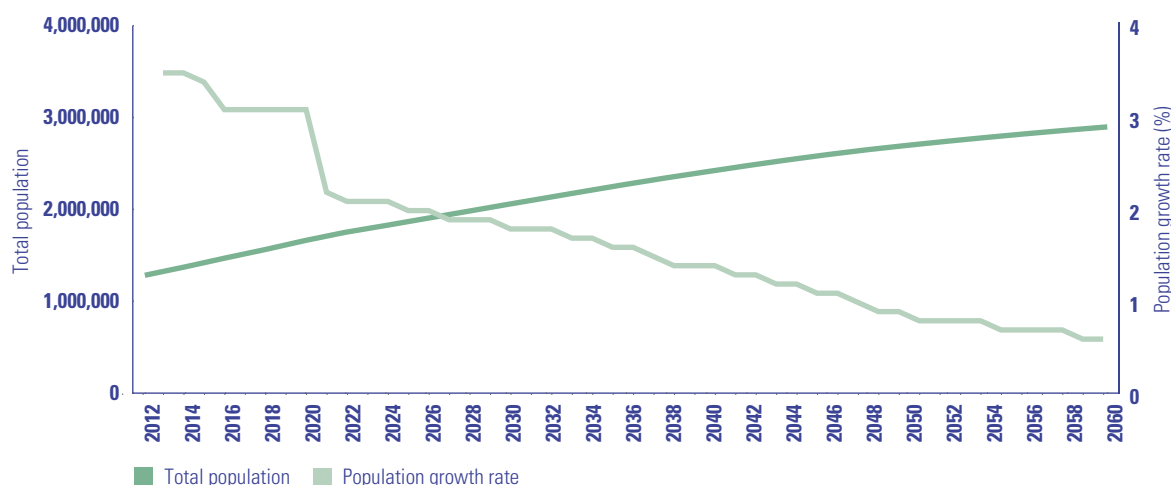


Figure 29: Zanzibar’s total projected population and annual projected population growth in the low population growth scenario

Source: Author’s calculations based on assumptions in NBS and OCGS, 2018.

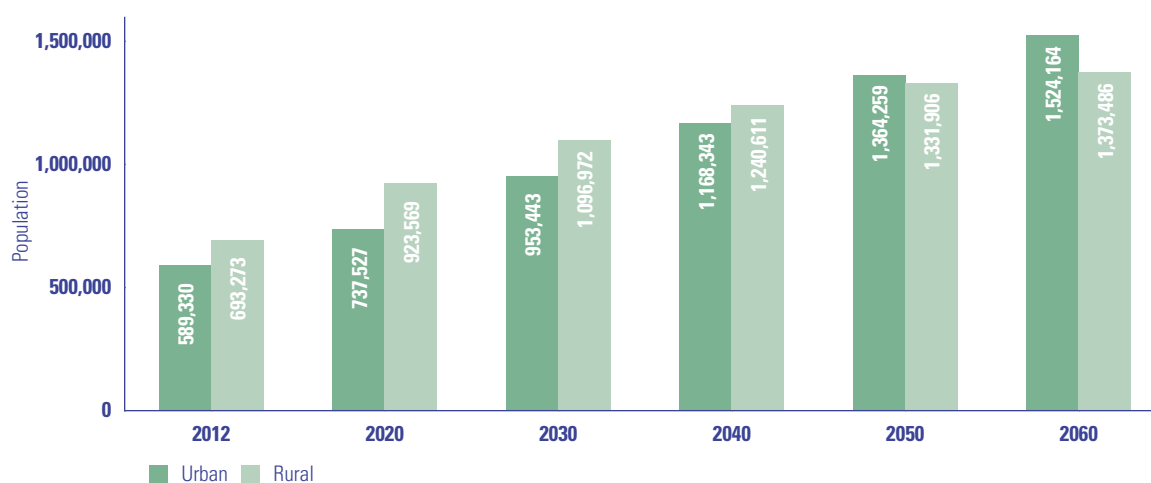


Figure 30: Zanzibar’s total rural and urban population projected in the low population growth scenario

Source: Author’s calculations based on assumptions in NBS and OCGS, 2018.

Table 7: Projected age proportion of population in the low population growth scenario and its difference to the high population growth scenario

Year	Low population growth scenario					
	0–17-year-olds		18–64-year-olds		65+ years old	
	Low population growth scenario	Low minus high population growth scenario	Low high growth scenario	Low minus high population growth scenario	Low high growth scenario	Low minus high population growth scenario
2020	48.9%	0.0 pp	48.4%	0.0 pp	2.7%	0.0 pp
2030	44.1%	-1.7 pp	52.0%	1.6 pp	4.0%	0.1 pp
2040	34.1%	-3.9 pp	60.5%	3.5 pp	5.4%	0.3 pp
2050	28.4%	-4.5 pp	64.1%	3.7 pp	7.5%	0.8 pp
2060	22.6%	-5.6 pp	66.4%	4.0 pp	11.1%	1.6 pp

Source: Author's calculations based on assumptions in NBS and OCGS, 2018.

Note: pp = percentage points

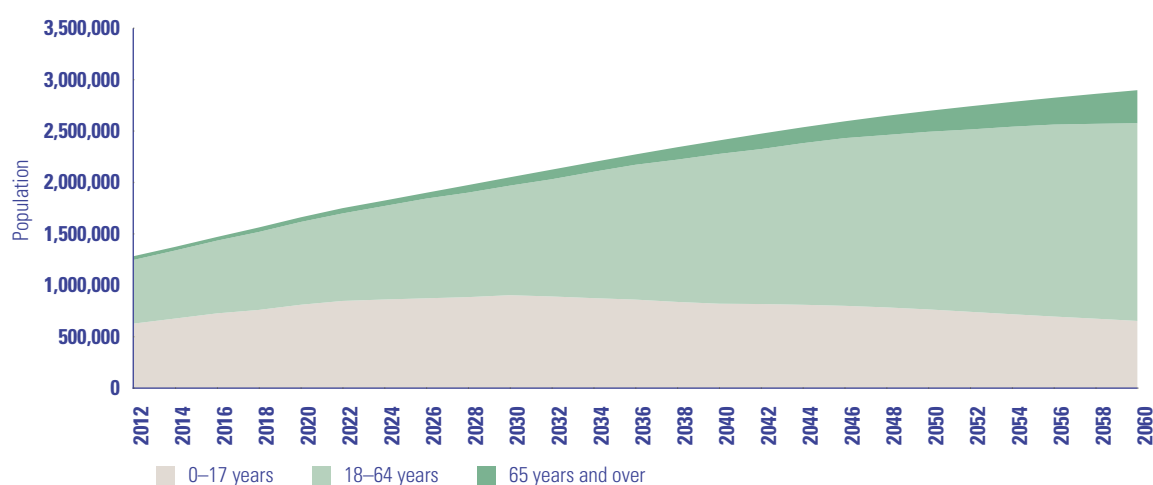
Furthermore, it is projected that the working-age population (18–64-year-olds) will increase from approximately 829,000 in 2021 to 1.9 million by 2060 (see Figure 31). Simultaneously, the child population (0–17-year-olds) is expected to decrease from 838,000 to 654,000 during the coming four decades. Compared to the high population growth scenario, these proportions are lower, while those of the working-age population and those aged 65 and over are higher. Shares of the population subgroups, their evolution over time, as well as how they compare to the high population growth scenario are shown in Table 7.

In relation to one another, these population subgroups and their changes over time will influence Zanzibar's total dependency ratio. As seen in Figure 32, this ratio will drop significantly over

the coming years – more so for the low population growth scenario than for the high population growth scenario.

The larger drop in the low population growth scenario is the result of an additional effort to reduce the total fertility rate of women in Zanzibar leading to a decline of 26.3 percentage points in the number of children as a percentage of the entire population in the next four decades. Combined with the increase in the elderly population, the total dependency ratio will fall from a level of 106.7 in 2021 to 50.7 by 2060. In other words, while 100 working-age individuals supported roughly 107 dependents in 2021, this will decrease to roughly 51 dependents by 2060.

The higher dependency ratio under the high population growth scenario implies that the working-

**Figure 31:** Total projected population by age-group under the low population growth scenario

Source: Author's calculations based on assumptions in NBS and OCGS, 2018.

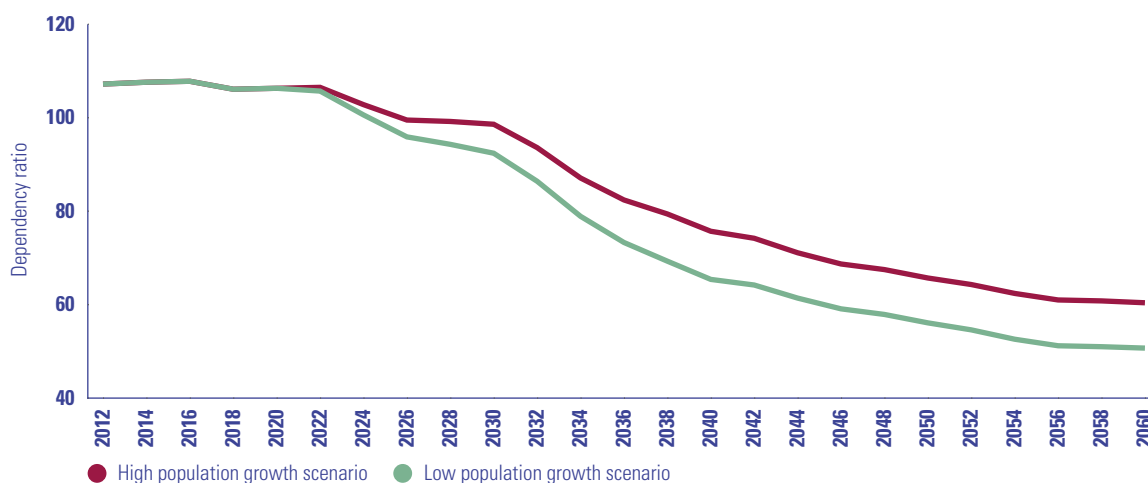


Figure 32: Projected dependency ratio, by population growth scenario

Source: Author's calculations based on assumptions in NBS and OCGS, 2018.

age population (the economically active population) faces a greater burden in supporting and providing the social services needed by children and the aged than they would under the low population growth scenario. This low population growth scenario should thus lead to a higher level of national and household income if appropriate educational investment and subsequent job opportunities are provided to the growing working-age population of Zanzibar.

As discussed at the beginning of this chapter, it must once again be mentioned that the subsequent sectoral results reflect the most-favourable trajectory that the RGoZ could follow in the coming four decades. This trajectory implies that the RGoZ would introduce policies and initiatives to curb population growth rates over the coming four decades as illustrated in Figure 29. Furthermore, the government would improve the access and quality of the sectoral indicators over time through high levels of public investment so as to align them to national and international policy targets. The results related to low public investment levels under the low population growth scenario are discussed in Appendix 3 (online).

3.2.2 Education

In contrast to the status-quo trajectory, **the most-favourable trajectory reflects the fiscal implications of reducing the population growth**

rates as well as enhancing pre-primary, primary and secondary education access and quality in line with key national and international policy targets (as outlined in Zanzibar's 2050 Development Vision targets; its ZEDP II; the SDGs; and the Education 2030 Framework for Action). This includes attaining gross enrolment rates equivalent to 100 per cent, reducing dropout rates, reducing teenage pregnancy through the introduction of modern contraceptive methods, improving the training curriculum of teachers and ensuring that teachers are qualified, and building more and bigger schools, amongst others.

In line with this, the gross public enrolment rates under the most-favourable trajectory are expected to improve by approximately 20 to 30 percentage points at all levels over the coming two decades (see Table 2). By 2040, each education level will have attained a rate of 100 per cent.¹⁹ In the same year, this will equate to approximately 23,000 students at public pre-primary level, 250,000 students at public primary level and 174,000 students at public secondary level. **This equates to an additional average of 818 children entering the public schooling system annually between 2021 and 2040.** Given this increase in enrolled students, as well as the improvements in the pupil-to-teacher ratio, the number of pre-primary teachers will need to rise by roughly 36 per cent by 2060, with the

19 Supplied by the Ministry of Education and Vocational Training.

Table 8: Projected number of teachers, classrooms and schools by education level under the most-favourable trajectory

	Pre-primary			Primary			Secondary		
	Teachers	Classrooms	Schools	Teachers	Classrooms	Schools	Teachers	Classrooms	Schools
2021	955	323	35	6,816	3,512	293	5,312	2,037	210
2030	1,128	417	37	7,796	4,320	293	8,362	3,330	270
2040	1,527	658	47	7,234	4,483	246	8,130	3,464	236
2050	1,569	816	51	7,496	5,164	247	8,649	3,844	227
2060	1,301	677	37	6,139	4,229	176	7,538	3,350	173

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; and UNICEF and RGoZ, 2018a and 2021a.

number of primary and secondary school teachers needing to rise by roughly 23 per cent and 71 per cent, respectively, between 2021 and 2030 (see Table 8). Compared to the status-quo trajectory, this represents a significant increase in investment, as the maximum number of teachers to be employed between 2021 and 2060 differs significantly – by 537 public pre-primary teachers, 7,375 public primary teachers and 8,050 public secondary teachers.²⁰

Additionally, improved access and quality education will also require an increase in the number of classrooms per school at each education level. The largest change in this respect is seen at the pre-primary level, where the total number of classrooms will need to more than double during the coming four decades. At primary and secondary level, an increase of 47 per cent and 89 per cent is required, respectively. With more enrolled students and more classrooms, yet limited space for expansion, the RGoZ will also need to construct more and bigger schools. As a result, during the next 39 years, Zanzibar will require a maximum of 51 public pre-primary schools, 330 public primary schools and 289 public secondary schools assuming that the number of classrooms per school will double across all three education levels.²¹ This is an additional 16 public pre-primary schools, 37 public primary schools and 79

public secondary schools compared to the numbers in 2021. Yet, with changing demographics, a number of schools will become idle over time, resulting in 37 public pre-primary schools, 176 public primary schools and 173 public secondary schools being needed in 2060 as illustrated in Table 8.

When compared to the status-quo trajectory, the required maximum number of schools represents an additional 13 public pre-primary schools, yet fewer public primary and secondary schools – 29 and 11 schools, respectively – within the coming four decades. This is attributed to a reduction in the primary gross enrolment rate to 100 per cent, as well as an overall reduction in the population growth rate over time.

The improvements in the outcomes in line with national and international policies bring with them considerable fiscal implications.

During the coming four decades, the nominal and real education budget will increase under the most-favourable trajectory. While the budget equated to US\$84.4 million in 2021, it rises nominally to US\$867 million in 2060. In real terms (2020/21 prices), this equates to US\$174.2 million for the same year (see Figure 33). Attaining the Education 2030 Framework for Action²² would require a nominal total investment of approximately US\$14.3

²⁰ Author's calculations.

²¹ This implies an increase in the size of public pre-primary schools from an average of nine classrooms per school in 2021 to 18 classrooms per school in 2060. For public primary schools, this equates to an increase from 12 classrooms per school in 2021 to 24 classrooms in 2060. Lastly, for public secondary schools, the numbers equate to 10 classrooms and 19 classrooms, respectively.

²² This implies that Zanzibar's education budget will equate to 4 per cent of GDP and 15 percent of government expenditure by 2030, and continue to slightly increase thereafter, attaining 5.5 per cent of GDP and 15.8 per cent of government expenditure by 2060.

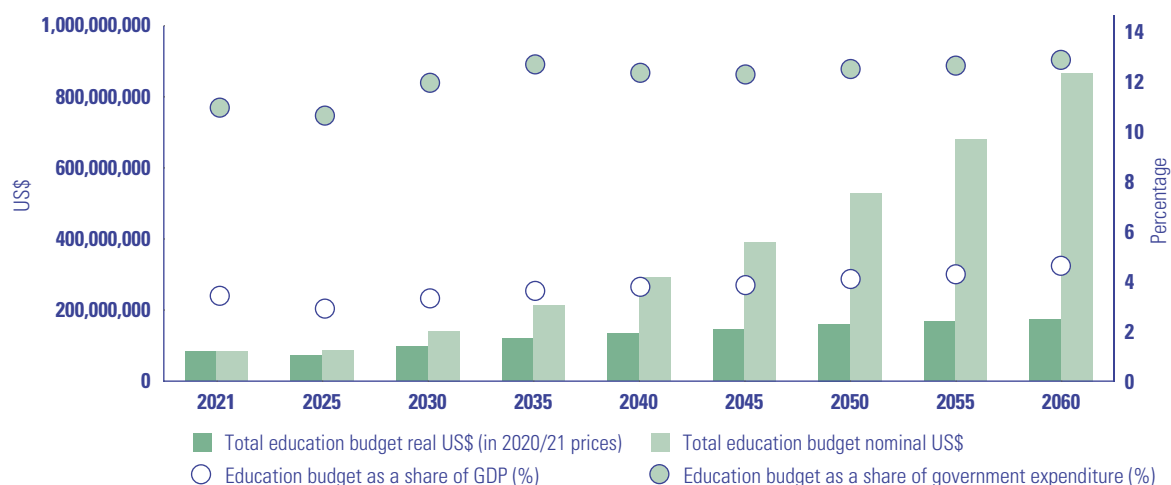


Figure 33: Projected nominal and real education budget, in absolute terms and as a percentage of GDP and government expenditure under the most-favourable trajectory

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; and UNICEF and RGoZ, 2018a and 2021a.



Figure 34: Total real education budget in US\$ by trajectory (in 2020/21 prices)

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; UNICEF and RGoZ, 2018a and 2021a.

billion over the coming 39 years. This equates to US\$5.2 billion in real terms.

When compared to the status-quo trajectory, a diverging trend is seen in the real education budget across time (see Figure 34). While in 2021, the real education budget amounted to US\$84.4 million for both trajectories, the gap between the two trajectories increases to US\$38 million in 2030, US\$67.4 million in 2040, US\$89.1 million in 2050 and US\$96.6 million in 2060. As a result, the improvements in access to and quality of education,

in conjunction with curbing population growth rates over the 39-year period, will have led to roughly US\$2.4 billion more in real costs compared to following the status-quo trajectory. Yet, while more expensive, the most-favourable trajectory will lead to better educational outcomes in the long run.

3.2.3 Health

Considering the most-favourable trajectory in the health sector, Zanzibar not only reduces its total fertility rate over time, but also improves

Table 9: Changes in the number of medical staff, public hospital beds and public health facilities under the most-favourable trajectory

	Medical staff	Public hospital beds		Public health facilities	
		Primary	Secondary and tertiary	Primary	Secondary and tertiary
2021	1,755	223	1,060	162	8
2030	9,124	641	3,050	319	16
2040	10,720	753	3,583	277	14
2050	11,998	843	4,010	247	12
2060	12,895	906	4,310	220	11

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; UNICEF and RGoZ, 2018a and 2021a.

the quality and access to health care at primary, secondary and tertiary levels to achieve a Universal Health Coverage Index of 90 per cent and to attain the Abuja Declaration expenditure target. This includes not only an increase in the number of medical staff available per 10,000 individuals, but also an improvement in the number of facilities and the services they provide. As a result, by 2030, the Zanzibari population will benefit from the availability of 44.5 medical staff per 10,000 individuals as well as an increased number of public hospital beds (18) per 10,000 individuals as identified under the targets of the 2030 SDGs. Furthermore, during the next 39 years, the average number of beds per public health facility will increase by 75 per cent – implying that any new facility constructed will be bigger than existing ones. These elements combined should improve health outcomes and reduce the currently low coverage of health care from 43 per cent to 90 per cent in Zanzibar.

As seen in Table 9, **by 2060, attaining the above-mentioned targets will require an increase in the number of medical staff by a factor close to seven.** Simultaneously, the growing population and the expansion in the number of beds per facility will also require investment by the RGoZ in the construction of public health facilities.

In total, 157 additional public primary health-care facilities will need to be constructed, along with eight additional public secondary and tertiary hospitals. This equates to approximately one public hospital and 16 public primary health facilities per year up to 2030. This is far above the current investment, yet will be necessary if Zanzibar is to meet its 2030 SDG targets in the health sector.

Furthermore, it must be noted that, after 2030, no further public facilities or hospitals will need to be built, as the population growth rate starts to decline slowly. This implies that some of the constructed facilities and hospitals that are urgently needed in the coming decade will become idle thereafter. Yet, across time, these facilities could be repurposed, (homes for the aged, facilities for people in need, etc.).

With these facilities being built to triple in size by 2060, the total number of beds will increase to 906 in the public primary health-care system by 2060 and to a total of 4,310 in the public secondary and tertiary health-care system. This equates to approximately four beds per public primary health-care facility and 392 beds in each public secondary and tertiary facility in 2060.

The fiscal implications related to an improvement of the Universal Health Coverage Index to 90 per cent as well as to the attainment of the Abuja Declaration target are considerable. The total public health budget of US\$47.3 million in 2021 will increase to US\$838.8 million in 2060. In real terms (2020/21 prices), the latter equates to US\$168.6 million. Aggregated across the 39 years, the entire investment would total US\$14.8 billion in nominal terms, and US\$5.4 billion in real terms (see Figure 35).

A similar trend is seen when considering government expenditure only on essential health services, which nominally rises from US\$38 million in 2021 to US\$673.6 million in 2060. Combined, these equate to an overall investment by the RGoZ into essential services of approximately US\$11.9 billion (US\$4.3 billion in real terms) (see Figure 36). In

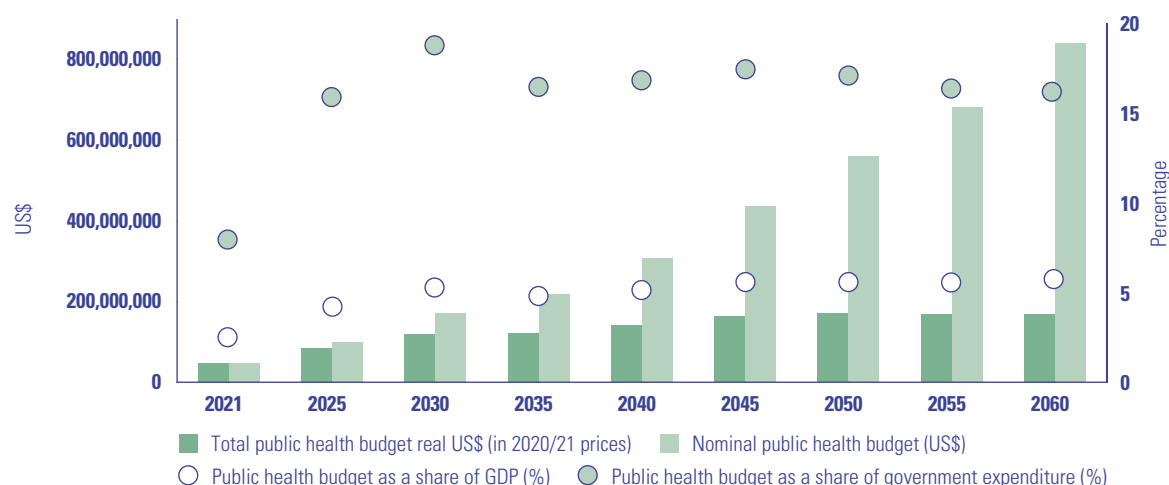


Figure 35: Projected nominal and real overall health-care budget, in absolute terms and as a percentage of GDP and government expenditure under the most-favourable trajectory

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; and UNICEF and RGoZ, 2018a and 2021a.

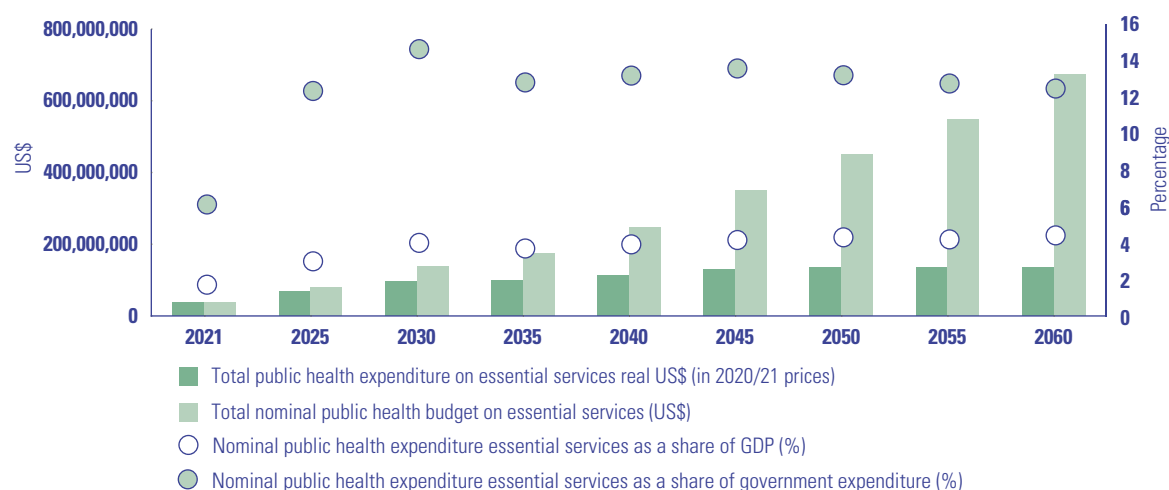


Figure 36: Projected nominal and real health-care budget on essential services, in absolute terms and as a percentage of GDP and government expenditure under the most-favourable trajectory

Source: Author's calculations based on assumptions in NBS and OCGS, 2018; and UNICEF and RGoZ, 2018a and 2021a.

this trajectory, by 2030, Zanzibar will have an overall health-care expenditure as a share of GDP of 5 per cent and as a share of government expenditure of 18.4 per cent.²³ Notably, there is a slight decrease in these shares after 2030 given that the key targets outlined in Table 2 will have been met; thus requiring

fewer investments by the RGoZ during the remaining 30 years.

When compared to the status-quo trajectory, a diverging trend is seen in the total real health budget across time (see Figure 37). While in 2021, the real health budget amounted to US\$47.3 million for

²³ This surpasses the target set out in the Abuja Declaration, but is needed in order for the 2030 SDG targets to be met given the growing population over time along with improvements in health outcomes. Furthermore, this level of expenditure in 2030 ensures that future budget shares as a percentage of government expenditure, no longer fall below the 15 per cent target.

both trajectories, the gap between the two increases to US\$87.9 million in 2030, US\$113.4 million in 2040, US\$143 million in 2050, and US\$139.7 million in 2060. Thus, across the four decades, the improvements in access to quality health care combined with curbing population growth rates will lead to roughly US\$4.2 billion more in real costs compared to remaining in the status-quo trajectory.

While more expensive, it is important to note however, that incurring higher costs would allow for a larger reduction in neonatal, infant, under-five and maternal mortality rates compared to

the status-quo trajectory. Neonatal mortality would decline by 26 deaths per 1,000 live births; infant mortality by 31 deaths per 1,000 live births; under-five mortality by 55 deaths per 1,000 live births; and maternal mortality by 92 deaths per 100,000 live births. As a result, by 2060, the mortality rates would equate to 3, 16, 12 and 215 deaths, respectively (see Figure 38). **According to this calculation, an annual average of 2,239 infants and 6,383 children under the age of 5 would pass away.** This is 56 per cent and 66 per cent lower respectively, compared to the status-quo trajectory.



Figure 37: Total real overall health-care budget in US\$ by trajectory (in 2020/21 prices)

Source: Author’s calculations based on assumptions in NBS and OCGS, 2018; and UNICEF and RGoZ, 2018a and 2021a.

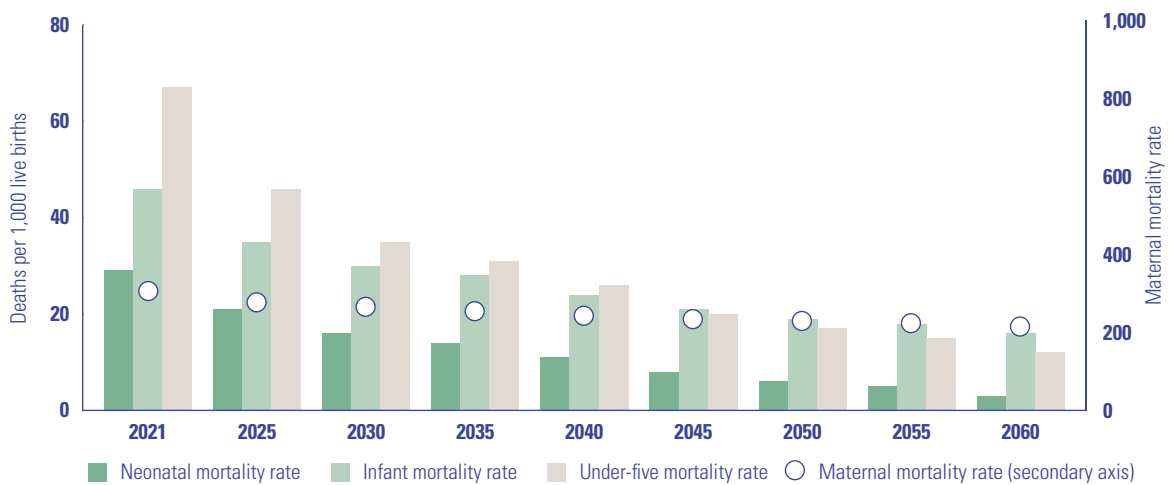


Figure 38: Projections in health outcomes under the most-favourable trajectory

Source: Author’s calculations based on assumptions in NBS and OCGS, 2018; UNICEF and RGoZ, 2018a and 2021a; and relevant literature.

Table 10: Urban and rural populations with access to electricity, water and sanitation under the most-favourable trajectory

	Electricity/solar power				Piped/improved water				Improved sanitation services			
	Urban		Rural		Urban		Rural		Urban		Rural	
	Absolute	%	Absolute	%	Absolute	%	Absolute	%	Absolute	%	Absolute	%
2021	614,892	–	364,342	–	595,529	–	203,367	–	534,702	–	409,366	–
2025	740,303	20.4	618,010	69.6	657,183	10.4	544,825	167.9	691,578	29.3	681,742	66.5
2030	919,596	24.2	974,111	57.6	924,840	40.7	1,064,063	95.3	953,443	37.9	1,096,972	60.9
2035	1,062,189	15.5	1,173,999	20.5	1,062,189	14.9	1,173,999	10.3	1,062,189	11.4	1,173,999	7.0
2040	1,168,343	10.0	1,240,611	5.7	1,168,343	10.0	1,240,611	5.7	1,168,343	10.0	1,240,611	5.7
2045	1,270,194	8.7	1,295,854	4.5	1,270,194	8.7	1,295,854	4.5	1,270,194	8.7	1,295,854	4.5
2050	1,364,259	7.4	1,331,906	2.8	1,364,259	7.4	1,331,906	2.8	1,364,259	7.4	1,331,906	2.8
2055	1,446,830	6.1	1,357,104	1.9	1,446,830	6.1	1,357,104	1.9	1,446,830	6.1	1,357,104	1.9
2060	1,524,164	5.3	1,373,486	1.2	1,524,164	5.3	1,373,486	1.2	1,524,164	5.3	1,373,486	1.2

Note: 'Absolute' refers to the number of individuals that have access to the respective services in the indicated years.
Source: Author's calculations based on assumptions in NBS and OCGS, 2018.

3.2.4 Infrastructure

In comparison to the status-quo trajectory, the most-favourable trajectory under the infrastructure sub-model will require the RGoZ to focus more specific attention on the rural population if the 2030 targets under the SDGs are to be met. This will be necessary as this population currently has lower access rates to infrastructure than the urban population. It thus needs higher investment in order to meet relevant targets by 2030. This is illustrated by the projected relatively steep rise in rural population access figures in the years 2022 to 2030, compared to the moderate increase thereafter – especially when considering water and sanitation infrastructure (see Table 10).

The rapid rise in access rates within the coming decade is also reflected by costs that will need to be incurred by the RGoZ. As seen in Figure 39, nominal costs range between US\$28.9 million and US\$37.7 million from 2022 to 2030, after which they fall to an average of US\$10.8 million per year when considering the time period 2031 to 2060. By infrastructure, this equates to a total nominal

investment of US\$115.9 million in power, US\$171.5 million in water, and US\$335.6 million in sanitation between 2021 and 2060. Combined, the extension of services to achieve universal access will cost, on average, 0.42 per cent of annual GDP and 1.52 per cent of annual government expenditure in the most-favourable trajectory.

When compared to the status-quo trajectory, the most-favourable trajectory is more costly from 2022 to 2050, but becomes cheaper from then onwards (see Figure 40).

This is largely due to the achievement of universal access in 2032 as well as the slower population growth rate in the most-favourable trajectory. This implies that fewer individuals will require access to the three infrastructures from 2050 than compared to the status-quo trajectory. Consequently, the difference in the real infrastructure budget²⁴ between the two trajectories decreases from US\$20.8 million in 2022 to US\$20.5 million in 2030, US\$1.1 million in 2040, and US\$5,400 in 2050. Thereafter, it turns negative, attaining a difference of US\$418,000 in 2060.

²⁴ Defined as the real infrastructure budget under the most-favourable trajectory minus the real infrastructure budget under the status-quo trajectory.

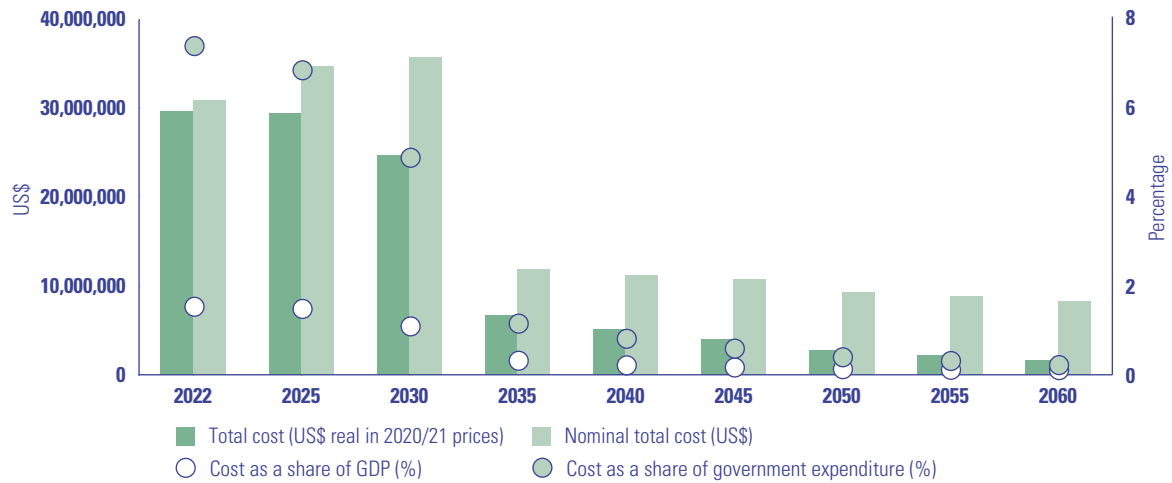


Figure 39: Projected nominal and real infrastructure budget, in absolute terms and as a percentage of GDP and government expenditure under the most-favourable trajectory
 Source: Author’s calculations based on assumptions in NBS and OCGS, 2018; as well as assumptions regarding extension costs retrieved from World Bank, 2019; and Hutton and Varughese, 2016.

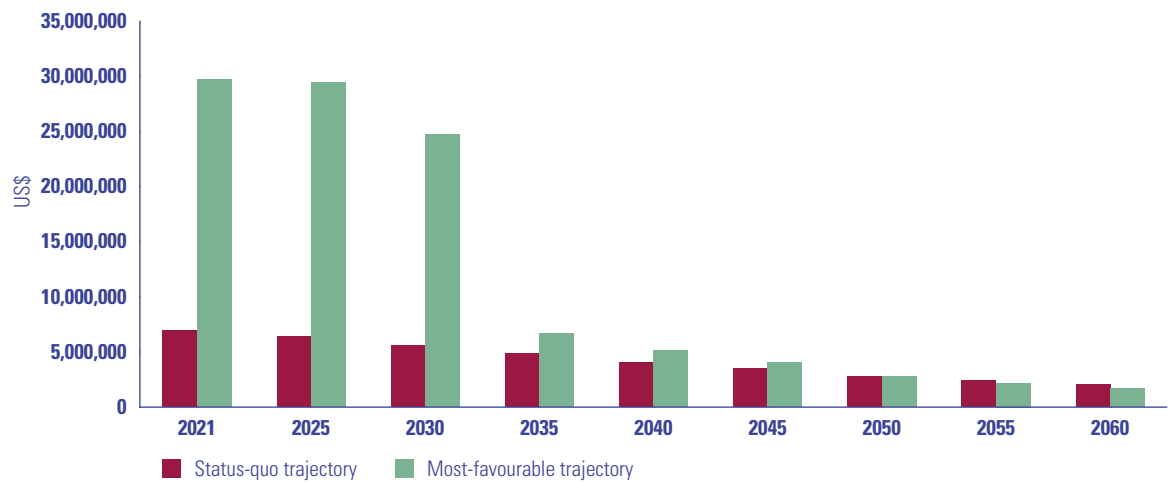


Figure 40: Total real overall infrastructure budget in US\$ by trajectory (in 2020/21 prices)
 Source: Author’s calculations based on assumptions in NBS and OCGS, 2018, as well as assumptions regarding extension costs retrieved from World Bank, 2019; and Hutton and Varughese, 2016.

Across the 39-year period, the improvements in access, in addition to a reduction in the total fertility rate, will lead to roughly 2.3 times the real costs when compared to remaining at the current status quo – i.e., US\$376.9 million compared to US\$162.6 million under the status-quo trajectory.

Yet, these investments are important, not only to increase the productiveness of households and businesses, but also to ensure that child health and nutrition improves, given

that appropriate sanitation services and clean water are paramount to stopping the spread of diseases such as cholera, diarrhoea and intestinal parasites, which can cause malnutrition, stunting and wasting in children (UNICEF, 2015). In addition to this, adequate sanitation and water facilities in schools are crucial, especially for girls, as suboptimal water, sanitation and hygiene conditions may hinder their full participation and lead to poor performance and increased dropout rates (UNESCO, 2021).

3.2.5 Social development

The exact gains that can be achieved by not only lowering fertility over time, but also improving the economic indicators in line with regional averages are illustrated in Table 11.²⁵ **When comparing the most-favourable to the status-quo trajectory, the GDP per capita gains are larger in the former.** This result is robust to a sensitivity analysis. While the most-favourable trajectory assumes that Zanzibar's economic indicators will improve to the average of African upper-middle-income countries, the results from the sensitivity analysis (i.e., column 4 of Table 11) illustrate that this also holds true when assuming that the indicators solely improve to the average of African lower-middle-income countries. Consequently, by improving the opportunities in the labour market, while simultaneously curbing population growth rates, GDP per capita increases to US\$12,351 by 2060.

Such achievements are also present when considering the rate of poverty in Zanzibar.

Similar to the status-quo trajectory, the poverty rate of the most-favourable trajectory equates to 25.7 per cent in 2021. Nevertheless, over time, this trend diverges. While the poverty rate solely declines to 12.8 per cent in 2060 under the status-quo trajectory, it reduces to 8.2 per cent under the most-favourable trajectory. The latter is also lower than the poverty reduction achieved under the sensitivity analysis, which sees a rate of 10.6 per cent attained by 2060.

However, when considering both the gains related to GDP per capita and poverty reduction, it must be noted that by not achieving economic indicators that are in line with the averages of African upper-middle-income countries, but rather those of African lower-middle-income countries (i.e., the sensitivity analysis), Zanzibar loses 10 years of progress (see Table 11). As a result, Zanzibar would have an overall lower level of well-being, which impacts education attained, health care accessed and utilized, as well as tax payments rendered, among other aspects.

Table 11: GDP per capita, poverty rates and numbers of poor individuals per trajectory

	Status-quo trajectory	Most-favourable trajectory	Most-favourable trajectory (sensitivity analysis)
GDP per capita (US\$)			
2021	1,099	1,099	1,099
2030	1,397	1,536	1,517
2040	2,044	3,389	2,557
2050	3,150	7,123	4,420
2060	4,976	12,351	7,315
Poverty rate (%)			
2021	25.7	25.7	25.7
2030	23.0	22.0	22.2
2040	19.3	15.1	17.4
2050	15.8	10.6	13.4
2060	12.8	8.2	10.6
Poor individuals (in thousands)			
2021	440.2	440.2	440.2
2030	487.1	451.4	454.1
2040	496.1	363.3	417.8
2050	473.1	285.5	361.9
2060	431.1	237.1	307.4

Source: Author's calculations based on assumptions in NBS and OCGS (2018), as well as information regarding relevant indicators in economic development, health and labour force retrieved from the World Economic Forum's (WEF's) Global Competitiveness Index indicators (WEF, 2017); MoHCDGEC et al., 2016 (fertility, mortality, life expectancy and family planning indicators); OCGS, 2016 (the labour force participation rate); and relevant literature.

25 See Table 2 for more information on the regional averages of the economic indicators used.

Box 4: Zanzibar's Development Vision 2050

In line with the results presented, it is also important to showcase how Zanzibar will fare in 2050 – the year in which its 2050 Development Vision targets are to be met. This box presents an overview of the key social outcomes that are to be expected under the most-favourable trajectory by 2050 and discusses whether this has allowed for the attainment of targets.

With regard to education, Zanzibar will attain net enrolment rates of 90 per cent and over. Furthermore, with the increase in educational budget as well as the rising enrolment, Zanzibar will also build more and bigger schools, ensuring that these are adapted for minorities such as disabled children. This amounts to a total of 51 public pre-primary schools, 247 public primary schools and 227 public secondary schools in 2050. In addition to this, the predicted budget will also be spent on hiring more teachers, improving their quality, as well as increasing the number of textbooks available. By 2050, a total of 17,714 public teachers will be employed in Zanzibar, with a total of over 409,000 textbooks across all education levels. The latter will result in a pupil-to-textbook ratio of five pupils per book for public pre-primary student, one book per public primary student and one book per public secondary student in 2050. Combined, this will improve the test scores across all subject areas in public schools, which in turn will increase transition rates from primary to secondary, and from secondary to tertiary education.

In terms of health, the projected budget under the most-favourable trajectory will ensure that the share of health expenditure increases to attain the Abuja Declaration target of 15 per cent of government expenditure. This also meets the 10 per cent target set out in the 2050 Development Vision. In addition, as indicated by the projected health indicators, the targets in relation to neonatal, infant and under-five mortality will also be met. By 2050, neonatal mortality is projected to decline to six deaths per 1,000 live births, infant mortality to 19 deaths, and under-five mortality to 17 deaths. The exception to this is maternal mortality, which is set to attain a level of 227 deaths per 100,000 live births by 2050 – a total of 158 deaths over the target outlined under the 2050 Development Vision. Furthermore, with a medic-to-population ratio of 1:225 in 2050, it is assumed that the target related to doctor-to-population ratio will also be achieved. Yet it must be noted that this is based on the assumption that the target outlined under the SDGs will be reached by 2030.

When considering electricity, water and sanitation, significant strides will be made in the coming thirty years. As a result, by 2032, 100 per cent of all households, in both urban and rural areas, will have access to electricity from the grid or from renewable resources, improved sanitation services and access to either piped or improved water sources – thereby attaining the target set out under the 2050 Development Vision.

Finally, in terms of social development, a significant rise in GDP per capita, as well as a reduction in poverty, will be attained. If Zanzibar manages to improve its economic indicators to the average exhibited in Africa's upper-middle-income countries, its GDP per capita will equate to US\$7,123 and poverty will amount to 10.6 per cent by 2050. This will have allowed the country to achieve its goal of becoming an upper-middle-income country by 2050.

Chapter 4

DISCUSSION AND RECOMMENDATIONS





According to Zanzibar's Development Vision 2050, pre-primary and primary education does not ensure the attainment of an adequate level of literacy and numeracy.

4.1 Discussion

Together, the results discussed throughout the previous chapter indicate that the RGoZ will benefit the most, both economically and socially, by implementing policies that allow for improvement in the underlying sectoral indicators as well as for the reduction of the country's total fertility rate over time. Although the costs are more significant when compared to maintaining the 'status quo', Zanzibar will be able to reap the economic benefits of the demographic transition (higher economic growth rates due to increased productivity); thereby leading to lower future fiscal implications as well as the attainment of its target of becoming an upper-middle-income country by 2050.

4.1.1 Education

Education, over the past 20 years, has seen several key developments in Zanzibar, including the construction of schools, improvement in the quality of teaching through training, as well as improvement in enrolment. These have all been instituted to complement the policy of free education introduced in 1964, thereby aiming to transform the educational system to support the building of productive human capital. Yet despite these efforts, the RGoZ is still faced with a multitude of challenges across all

levels of education. In fact, according to Zanzibar's Development Vision 2050, pre-primary and primary education does not ensure the attainment of an adequate level of literacy and numeracy.

Simultaneously, secondary education could be more focused on the provision of skills, including innovation, critical thinking, creativity and employment-oriented skills development (RGoZ, 2020). In addition to these, a number of schools still struggle to provide their students with sufficient classrooms and teaching and learning materials. Combined, this impacts not only access to schooling, but also its quality.

With a growing child and youth population over time, feasible investment will need to be undertaken to overcome these challenges. As the results indicate, the maximum increase of public primary and secondary enrolment under the most-favourable trajectory²⁶ by 5.4 per cent and 12.7 per cent respectively, will require the RGoZ to invest in both the hard and soft infrastructure of schooling. This includes building (bigger) schools and hiring more trained teachers in order to allow for a decline in the student-to-teacher ratio to the levels identified under international and national policy targets. In Zanzibar, an additional 4,631 teachers would need to be hired by 2050 to reduce the pupil-to-teacher ratio from 19.6 pre-primary, 41.8 primary and 24.1 secondary schoolchildren per teacher in 2021, to 13, 31 and 20 students by 2050, respectively. Also, through the building of more and bigger schools (in total, 132 schools as indicated by the results for the most-favourable trajectory), the pupil-to-classroom ratios will decline from 57.8 pre-primary students, 81.2 primary students and 62.7 secondary students per classroom in 2021 to ratios of 25, 45 and 45, respectively, by 2050.

Therefore, while this expansion for the most-favourable trajectory may cost a total of US\$14.3 billion nominally (US\$5.2 billion in 2020/21 prices) over the coming four decades, as indicated by the results, it is required if current access to, and quality of, education is to be improved in Zanzibar. By doing so, the RGoZ will also be able to achieve the Education 2030 Framework for Action as evidenced

²⁶ As a recap, this trajectory assumes improvements in key social indicators over time, along with a lowering of the population growth rate.

by an education budget that equates to 4.2 per cent of GDP and 15.1 per cent of government expenditure by 2030, and 5.7 per cent of GDP and 16.3 per cent of government expenditure by 2060. This achievement is paramount to improving key sectoral outcomes.

The successful transition from primary to secondary education is of importance, especially for girls. This, together with an increase in the prevalence of modern contraceptive methods, helps delay marriage and first pregnancies. Furthermore, women with higher levels of education are more likely to participate in the wage-earning labour force, and more likely to have smaller families. This contributes to changes in the age structure given a further lowering of birth rates, which over time increase the opportunity for children and youth, especially women, to contribute to the Zanzibari economy, enhancing the potential for economic development.

4.1.2 Health

Since 1964, the RGoZ has pledged free health care for all. This has brought with it the responsibility to invest in key infrastructure and personnel from primary to tertiary level, as well as to promote adequate research and development initiatives. These investments aim to maintain a health-care system characterized as sustainable and equitable, which provides modern technologies and facilities along with a highly trained medical staff. So far, achievements in this field have allowed for an increase in life expectancy from 48 years in 2000 to 68 years in 2020 (RGoZ, 2020).

Yet despite these investments, Zanzibar's health sector continues to face significant challenges, especially where children and women are concerned. These challenges are exacerbated by a shortage of skilled health workers, especially in rural and remote areas of the country. In fact, the lack of doctors, nurses and midwives has contributed to the high rates of infant, under-five and maternal mortality rates. This, in combination with a shortage of medicines and a suboptimal state of facilities and

health technologies, illustrates that the present resources available are not sufficient to ensure the full provision of free quality health services for all individuals on Zanzibar. Instead, Zanzibar is currently assumed to have a Universal Health Coverage Index of 43 per cent – one that is in line with that of Tanzania as a whole (WHO, 2021b).

As in the education sector, the RGoZ will need to make extensive investment to overcome these challenges. With a growing and ageing population over time – as indicated by the proportion of individuals over 64 rising from 2.7 per cent in 2021 to 11.1 per cent in 2060 – the provision of high-quality health care is paramount to ensuring that these individuals stay healthy and productive. As a result, investments will be needed that not only allow for the construction of more and bigger primary, secondary and tertiary health facilities, but also adequately supply them with the technologies and medicines they require.

Therefore, in order for the population to be adequately serviced over time, results indicate that for the most-favourable trajectory, the RGoZ would need to build an additional 157 public primary health facilities and eight public secondary and tertiary facilities. This equates to approximately one hospital and 16 primary facilities per year up to 2030. In addition to this, each facility will need to triple the number of hospital beds that were available in 2021. As a result, the total number of beds will increase to 906 in the primary health-care system by 2060 and to a total of 4,310 in the secondary and tertiary health-care system.

Furthermore, in order to service a growing population and meet the international standards of achieving 44.5 medical staff per 10,000 people, **the RGoZ will need to invest at least US\$14.8 billion (US\$5.4 billion in 2020/21 prices) following the most-favourable trajectory during the coming 39 years** – as indicated by the results. By doing so, the country will have transformed its health sector to one that has a Universal Health Coverage Index of 90 per cent, and has achieved the Abuja Declaration target of allocating at least 15 per cent of the government budget towards health. In fact, by 2030, results indicate that Zanzibar's health budget will equate to

5 per cent of GDP and 18.4 per cent of government expenditure.²⁷

With such investment, improvements in key health outcomes are projected to occur in the coming four decades. In fact, compared to the country's status-quo trajectory, larger reductions in neonatal, infant, under-five and maternal mortality rates are envisioned under the most-favourable trajectory. From 2021 to 2060, neonatal mortality would decline by 26 deaths per 1,000 live births; infant mortality by 31 deaths per 1,000 live births; under-five mortality by 55 deaths per 1,000 live births; and maternal mortality by 92 deaths per 100,000 live births. As a result, the mortality rates would equate to 3, 16, 12 and 215, respectively, by 2060.

These improvements are of paramount importance for Zanzibar's economic growth as in addition to social and emotional costs, the death of a mother carries with it significant socioeconomic development losses – in terms of her contribution to the economy, but also towards the raising of potentially healthy and educated children. In order to avoid this, research has found that the provision of voluntary family planning services reduces maternal mortality by 30 per cent, lowers the probability of early childbearing and high-risk pregnancies, and increases child survival through improved nutrition and health (PACE, n.d.).

In addition, by reducing child mortality, the preference on family size is influenced, given that families foresee better child survival rates. With fewer and healthier children, families have an increased level of disposable income that can be invested into further improving their children's health, education and well-being. With these improvements, a transition from higher to lower rates of fertility and child mortality is achieved. The associated change in the age structure allows for the transitioning through the stages of the demographic transition model, which, in association with improved socioeconomic policies, can increase Zanzibar's economic gains over time.

4.1.3 Infrastructure

Since the revolution, investment in infrastructure has been one of the main priorities of the RGoZ. Particular areas of interest included the extension of road networks, as well as investments in energy, telecommunication networks and modes of transportation with the aim of catalysing the economic transformation of the country. Furthermore, focus was placed on improving households' access to water and sanitation services, especially among those residing in urban areas. This included interventions in water sourcing and distribution, as well as measures to ensure sustainable rainwater and solid waste management.

Despite these aspirations and the measures taken, the RGoZ has faced challenges in this regard. Within the energy sector, development strategies have been constrained by the lack of appropriate financing mechanisms. This, to a certain extent, restrains productivity, thereby affecting the economic growth of the country because Zanzibar's activities are highly energy intensive (RGoZ, 2020). This is showcased by the fact that the demand for electricity is rising rapidly at an average of 8 per cent per year due, in part, to the rapid expansion of the tourism sector. Furthermore, projections undertaken by the World Bank indicate that the demand for electricity will exceed the supply by 2022 (World Bank, 2019). Therefore, if networks are not expanded within the coming years, Zanzibar's productive sectors as well as its economic growth will suffer.

As a result of a growing population, there are also challenges in the water, sanitation and hygiene sector, especially with regard to operation and maintenance of water supply. In fact, in recent years, many parts of Zanzibar have been facing critical water shortages as a result of the dilapidation of the water infrastructure, (e.g., leaking pipes), as well as a decline of water supply from springs and other natural sources because of the impact of climate change. This places a burden on many Zanzibari households, especially women and children, as they are forced to go out and look for fresh water. In order to alleviate the situation, Zanzibar would need more than 200 million litres of

²⁷ This is over the target of 15 per cent, given that this is the budget required to achieve the targets set out in the SDGs as well as national policy documents.

fresh water per day for its entire population, but only roughly 50 per cent of this requirement is available according to ZAWA (Yussuf, 2015).

In light of these challenges, it is important that the RGoZ invests in improving the access and quality of infrastructure for the people of Zanzibar. This is of importance in light of a growing population along with increased rural-to-urban migration. Current access rates are not adequate to ensure that everyone can access electricity, water and sanitation. In fact, the rates vary significantly as indicated by the results of the projections. While 80.5 per cent of the urban population had access to electricity/solar power in 2021, only 38.4 per cent of the rural population did. In terms of piped/improved water, these percentages equate to 75.4 per cent and 10.2 per cent, respectively, while access to improved sanitation was present for 63.7 per cent of the urban and 34.1 per cent of the rural population.²⁸ Thus in order to achieve universal access to these three services by 2030, the RGoZ will need to concentrate on the rural areas, given that their rates are significantly below those of their urban counterparts.

Therefore, to attain and maintain universality of access to electricity, water and sanitation, results indicate that the RGoZ will need to invest, on average, US\$27.1 million annually from 2022 to 2030, and US\$10.8 million annually thereafter under the most-favourable trajectory. By sector, this equates to a total nominal investment of US\$115.9 million in power, US\$171.5 million in water, and US\$335.6 million in sanitation from 2021 to 2060 – equivalent to, on average, 0.42 per cent of annual GDP and 1.52 per cent of annual government expenditure. **Compared to maintaining access rates at the present level (the status-quo trajectory), the improvements in access and quality will lead to roughly 2.3 times the costs across the 39-year period.** Investments are required in order to ensure that the growing

population continues to productively contribute to Zanzibar's economy, thereby positively impacting long-term economic growth.

4.1.4 Social development

Zanzibar is in its second stage of demographic transition and, consequently, one of the main challenges that the RGoZ will face over the coming four decades is to ensure that the growing working-age population, especially the youth, will have access to productive labour market opportunities. This has proved difficult in the past. With a rapidly expanding population, along with high rates of fertility and a lack of adequate job creation, unemployment has been a pressing socioeconomic problem. While the rate stood at 5.5 per cent in 2006, it increased to 19.7 per cent in 2021 (NBS and OCGS, 2021; OCGS, 2016, n.d.). In addition, labour force participation rates fell from a level of 83.4 per cent in 2006 to 76 per cent in 2021.

In order to reduce the level of unemployment and increase the labour force participation rate, especially of women, the RGoZ needs to be able to generate productive and decent employment over the coming decades. This includes implementing policies that reduce the level of informality as well as establishing ones geared towards improving labour market flexibility, financial market efficiency and the effectiveness of public institutions.²⁹ The aim of these is to provide

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28 Author's calculations based on the 2019/20 Household Budget Survey and the 2015/2016 Demographic and Health Survey.

29 These can take many forms: "robust legal frameworks and representative parliaments with strong capacity for oversight; adept civil services and the timely and quality delivery of public services; efficient judiciaries that uphold the rule of law; vibrant and actively engaged civil societies; and free and independent media" (OECD, 2015).

employers with the freedom to make decisions about their workforce in accordance with labour law, provide employers and individuals with all the information needed to make appropriate decisions about their investments, as well as generate trust amongst citizens, reduce corruption and ensure that principles of integrity and disclosure are upheld, amongst others (OECD, 2015). By achieving this, Zanzibar will ensure that adequate public services are delivered to its population, investors are attracted, public funds are used adequately, and the development of the private sector is supported (OECD, 2015). Combined, these will allow Zanzibar to reap significant benefits in terms of GDP per capita and economic growth if combined with improvements in the aforementioned sectors.

In fact, according to the results, an improvement in labour market flexibility, financial market efficiency and the effectiveness of public institutions to the level exhibited by African upper-middle-income countries will allow Zanzibar to attain upper-middle-income status by 2043 – seven years ahead of the intended target. Any improvements less than these will hinder the attainment of this national target. By making these investments, the RGoZ will decrease the number of unemployed by approximately 27 per cent in 2060 – when comparing the most-favourable trajectory to the status-quo. This lower level of unemployment implies that more working-age individuals will be productively contributing to the Zanzibari economy. As a result, GDP per capita will increase from a level of US\$1,099 in 2021 to US\$12,351 in 2060, which is US\$6,894 higher than in a situation where no improvements to the current labour market are undertaken.

These are not the only gains that the RGoZ will reap. **By increasing labour market opportunities and thereby improving the standard of living for Zanzibaris, the government will also contribute to reducing the level of poverty.** While 25.7 per cent of the population was poor in 2021, this will decline to 8.2 per cent in 2060 on condition that Zanzibar implements policies that allow it to attain upper-middle-income status. In terms of the number of poor, this decline will equate to a reduction of close to 203,100 individuals over the coming four decades.

4.1.5 Combined results

Summing up, it must be emphasized that the RGoZ needs to invest in and improve existing policies in education, health, infrastructure and social development concurrently in order to establish a socioeconomic environment that is conducive to growth. By raising sectoral expenditure and permitting cross-sectoral synergies, Zanzibar can maximize the level of education attained by each child, reduce neonatal, infant, under-five and maternal mortality rates to levels closer to or on par with the targets identified in the SDGs, and consequently improve life expectancy.

Furthermore, through the implementation of policies that formalize the economy and generate jobs, the RGoZ can transition the children born in a period of high fertility into the labour market. In combination with high-quality education and health care for all, these children can become productive members of society – allowing them to earn a higher wage and save money. This, along with a decreased financial burden given government investment in education and health, as well as a decline in family size due to fewer births, will allow individuals to undertake more personal and business-related investments. Such investments, in combination with an increase in national savings, will in turn fuel economic growth and lead to an increase in Zanzibar's GDP per capita.

In order to achieve this, the RGoZ will need to invest a total nominal amount of roughly US\$30 billion during the coming four decades (approximately US\$11 billion in real terms (2020/21 prices)). This is roughly US\$16 billion more, in nominal terms, compared to a situation in which the RGoZ would continue to spend the same amount as was spent in 2021 for the coming 39 years. If disaggregated by year, the average annual total investment would equal US\$282.1 million in 2020/21 prices – double the amount spent on the sectors in 2021.

Disaggregated by sector, the total real investment across the 39 years equates to US\$5.2 billion for education, US\$5.4 billion for health care, and roughly US\$378.3 million for expansion of infrastructure. Yet, once again it must be emphasized that these are, at best, conservative estimates of what is

in store for Zanzibar. Potential feedback loops of income generated across time in conjunction with improvements in the standard of living were not endogenously included in the modelling of the sectors. Nor did the model account for potential synergies or multiplier effects that could be generated across the sectors through increased investments. This was due to the fact that the model could not accurately predict:

- To what extent the income of individual households would increase as a result of investments into education, health and infrastructure, and what impact this would have on the various outcome indicators across these sectors; and
- The synergies that could be generated between sectors through increased investments.

4.2 Recommendations

This assessment presents four main recommendations based on the findings outlined throughout the report. They focus on enabling a better transition from childhood to adolescence, focusing specifically on improving the access and quality of individuals to education, health, infrastructure, as well as to labour market opportunities.

4.2.1 Generate sustainable financing mechanisms

To achieve sustainable and equitable education, health, infrastructure and social protection services, it is vital not only to understand how public expenditure is allocated and used across the sectors, but also how to assess the efficiency, effectiveness and equity, as well as adequacy and sustainability of such expenditure. To do so, the RGoZ can introduce or strengthen various public financial management analysis tools. These include:

- The reintroduction of Public Expenditure Reviews per sector. These analyse the quality and quantity of public spending over time against national policy targets and identified performance indicators; thereby also identifying financial bottlenecks and challenges.
- The introduction of a Public Expenditure Tracking Survey. This traces the movement of

funds through several layers of government bureaucracy to determine what proportion of the originally allocated resources reach each level and how long it took to get there. This survey can help identify fund leakage and expenditure bottlenecks, while allowing for the production of recommendations on how to improve public spending efficiency.

- The regular production of budget briefs for each sector. This would allow the development of recommendations on how to "...improve the composition of spending, strengthen budget credibility and execution, increase or better target spending to rural or deprived regions or groups, and improve data collection and monitoring..." (UNICEF, 2017).

Additionally, the government can foster sustainable and innovative tax revenues that can subsequently be allocated towards education, health, electricity, water, sanitation and social protection by:

- Building trust among its citizens by providing them with transparency in terms of government spending. This can include the implementation and publication of a medium-term revenue strategy that informs citizens of how their money is spent. Furthermore, investments should be envisioned that enhance public services.
- Expanding the tax base yet keeping the system simple. Not only does this create a more predictable environment for investors, but it also encourages more small businesses to enter the formal sector, thereby discouraging tax evasion.
- Introducing a digital tax payment system once a comprehensive IT infrastructure has been developed in the country.

In addition to enhancing the country's financial reach and coverage, it is also of importance to consider introducing innovative financing mechanisms such as micro-contributions, taxes, public-private partnerships, and market-based financial transactions, providing they do not unduly burden the country.

Finally, the country should continue to strengthen its efforts in fighting corruption.

Rationale: Achieving national policy targets will require additional financial commitments over the coming years, especially in light of demographic pressures. By 2060, a total of 3.4 million people will require access to equitable public services that are aligned to national and international targets. The RGoZ will need to solve any inefficiencies in spending if they are to provide Zanzibar's growing population with adequate opportunities in a financially feasible and sustainable way.

4.2.2 Invest in more and better-qualified public staff, especially in the education and health sectors

Along with the increase of public revenue, the RGoZ will need to ensure that sufficient qualified public staff are present in all public education and health facilities. This can transpire through a number of avenues:

- The development of improved and transparent recruitment strategies and systems will ensure hiring public workers who are fully qualified for the job – thereby reducing the prevalence of under- and overqualified public sector staff.
- The adjustment of wages in line with annual real wage growth rates will ensure that public staff are motivated and remain in their jobs over time. This not only saves time, but also public resources used to search, hire and/or train new public staff. Furthermore, particular incentives

should be provided to individuals employed in remote areas.

- The development of specific rules and regulations will allow monitoring of public staff in the education and health sectors, including absenteeism and punctuality. This will be fundamental, as it feeds into the performance-based assessment of the public staff.
- Conducting a rapid assessment of education and health staffing needs across the country will identify the particular areas of shortages, especially of qualified public staff.
- The development of digital opportunities will foster regular training of staff, where applicable.

Rationale: With the growing demographic pressure, more education and health facilities will need to be built, while qualified public staff need to be hired and sustained, especially in remote areas of the country. By 2060, an additional 1.7 million individuals will require access to basic health care, while an additional 95,000 children aged 4–15 years will need access to basic education. While this will require more schools and health facilities, it is important that these are equipped with qualified public staff. Without them the adequate provision of quality health and education services cannot be guaranteed. In line with this demographic transition and ensuring that national and international sectoral targets are met, Zanzibar will require a total of 16,056 qualified public teachers and 3,462 qualified medical staff by 2060.

4.2.3 Universalize the access to electricity, water and sanitation infrastructure

With an increasing population over time, the RGoZ will need to ensure that universal access to these essential services is available for all, given that this is considered to be a basic human right. This can be achieved by:

- Creating new or strengthening existing policy frameworks designed for each sector, with particular focus on the attraction of investments related to innovation and entrepreneurship.
- Ensuring the enforcement of the 2015 Public-Private Partnership Act so that public utility institutions can partner with the private sector to identify and develop alternative technologies – be it to extend the sector's physical infrastructure, to

“ With the growing demographic pressure, more education and health facilities will need to be built, while qualified public staff need to be hired and sustained, especially in remote areas of the country.

extend access to electricity through renewable and non-renewable energy sources, to diversify the sources of potable water, or to construct sewage treatment systems for households and industries.

- Strengthening the capacities of the institutions and authorities involved, such as the staff of ZECO, ZURA and ZAWA. Their capacities need to be improved in line with developments made and technologies implemented for the sourcing, operation and management of the relevant utilities (energy, water and sanitation). This can be achieved with the help of sectoral experts.

Rationale: Infrastructure has been a main priority for the RGoZ since the revolution, yet universal access to electricity, water and sanitation is still a challenge. In 2021, an average of roughly 900,000 Zanzibaris still faced challenges to access the most basic of services, which is a basic human right. Without it, the country cannot ensure a healthy and productive economy. This not only influences the income of individuals, but also their long-term productivity; thereby impacting economic growth in the long run.

4.2.4 Generate more and better formal labour market opportunities

It is recommended that the RGoZ builds a more inclusive labour market that provides more and better formal employment opportunities, especially for youth and women. This requires a multipronged approach, ranging from reforming the education and training curricula, thereby reducing the mismatch of labour supply and demand, to implementing interventions and policies that address the need for gender equality and access to employment opportunities by youth. As such, the RGoZ is encouraged to:

- Revisit and update national policy documents related to the employment opportunities for youth to ensure that the priorities and opportunities for youth employment remain relevant and up to date. This includes the Zanzibar Youth Council Strategic Plan 2017–2022, and the Youth Employment Action Plan 2014–2018. Efforts are required to align these two plans to one another, as well as to the goals outlined by Zanzibar’s Development Vision 2050 and its forthcoming Strategy for Growth and Reduction of Poverty.

- Structurally reform the labour market, while ensuring adequate social investments are undertaken in key sectors to avoid the mismatch of labour demand and supply. This includes:
 - a. The adaptation of the entire basic educational curriculum – primary to secondary – to reflect the current and future needs of the labour market. This will require continuous dialogue with employers and teachers to align business needs with those of the education sector. Special attention should be given to putting theory into practice through hands-on learning.
 - b. Increase gross enrolment rates of basic education to 100 per cent as it is essential for further skills training and the prospect of employability.
 - c. Introduce or extend public employment services so that young jobseekers in each region and district can access their services. These agencies must work in close collaboration with employers to ensure that suitable matches are found for existing vacancies. Furthermore, specific provisions must be developed to ensure that these services reach out to the informal sector.
- Introduce campaigns, programmes and incentives to foster the employment of youth and women. This includes:
 - a. The introduction of behaviour-change campaigns both within the community as well as with educational institutions to promote gender equality, while also ensuring that the negative stigma of teenage pregnancy is eliminated over time.
 - b. The provision of youth-centred programmes, including lifelong learning programmes, training and apprenticeship programmes, as well as active labour market programmes. Each of these should include a mentoring component. Not only does this link youth to professionals, but it also provides them with access to the world of work and an understanding of what it means to be formally employed.
 - c. The provision of incentives to ensure that companies generate paid apprenticeship opportunities and jobs for youth, e.g., paid young professional programmes for

- which a proportion of the stipend is paid by government, tax incentives, etc.
- d. The development of transportation networks that allow individuals to commute affordably to school and to jobs, given that this remains a major barrier to human capital development and income generation opportunities.
 - e. Facilitation of financing for micro and small businesses.

The above points should be devised in such a way that they are geared towards the productive industries in Zanzibar – the ones that generate value addition to the economy and capitalize on the linkages between tourism, agriculture and trade. According to Zanzibar's Development Vision 2050, these industries include the commercialization of cloves, fisheries, oils, seaweed and dairy; the

extension of the ICT network; as well as the export of salt, jewellery, wooden products, electronics and handicrafts. These are important if the government aims to attain its goal of reducing the share of individuals employed in agriculture, while increasing the relevance of industrialization and trade development.

Rationale: To date, a large majority of women and youth workers remain under- or unemployed in the Zanzibari labour market. Many turn to the informal sector for opportunities, which contributes little to economic growth. This can be detrimental if changes are not made in time. In fact, if these changes do not occur, by 2060, a total of 649,250 individuals will be unemployed. This would represent an increase in the national unemployment rate from 19.7 per cent in 2021 to 33 per cent in 2060.

Bibliography

- Adams, R. H., Jr. (2003). 'Economic Growth, Inequality and Poverty: Findings from a new dataset', Policy Research Working Paper 2972. Washington, D.C.: World Bank.
- African Development Fund (2020). *Tanzania: Zanzibar Urban Water Supply and Sanitation Project – Project completion report (PCR)*. African Development Bank Group. Available at: <<https://www.afdb.org/en/documents/tanzania-zanzibar-urban-water-supply-and-sanitation-project-project-completion-report>>. Accessed on 2 September 2020.
- African Union Commission and United Nations Economic Commission for Africa (2013a). 'Beyond the First Dividend: Sustaining the second demographic dividend', Policy brief, Industrialization for an Emerging Africa, 21–26 March 2013, Abidjan, Côte d'Ivoire.
- African Union Commission and United Nations Economic Commission for Africa (2013b). 'Initiating the Demographic Dividend by Achieving a Fertility Decline', Policy brief, Industrialization for an Emerging Africa, 21–26 March 2013, Abidjan, Côte d'Ivoire.
- Agarwal, P. (2021). 'The Demographic Transition Model'. Available at: <https://www.intelligenteconomist.com/demographic-transition-model/>.
- Annual Joint Education Sector Review Technical Working Group (2019). *Annual Joint Education Sector Review Report 2019*. Zanzibar: Revolutionary Government of Zanzibar.
- Bengtsson, T. and K. Scott (2010). 'The Ageing Population', ch. 2 in *Population Ageing: A threat to the welfare state?*, edited by T. Bengtsson, Demographic Research Monographs. Available at: <<https://www.demogr.mpg.de/books/drm/008/2.pdf>>. Berlin: Springer-Verlag.
- Berlemann, M. and J-E. Wesselhöft (2012). 'Estimating Aggregate Capital Stocks Using the Perpetual Inventory Method: New empirical evidence for 103 countries', Working paper 125/2012. Hamburg: Helmut Schmidt University.
- Blank, R. M. (2000). 'Fighting Poverty: Lessons from recent U.S. history' in *Journal of Economic Perspectives*, vol. 14, no. 2, pp. 3–19.
- Blank, R. M. et al. (1993). 'Poverty, Income Distribution and Growth: Are they still connected?' in *Brookings Papers on Economic Activity*, no. 2 (1993), pp. 285–339.
- Bruno, M., M. Ravallion and L. Squire (1998). 'Equity and Growth in Developing Countries: Old and new perspectives on the policy issues', ch. 5 in *Income Distribution and High-Quality Growth*, edited by V. Tani and K-Y. Chu. Cambridge, Massachusetts: MIT Press.
- Darrat, A. F. and Y.K. Al-Yousif (1999). 'On the Long-Run Relationship Between Population and Economic Growth: Some time series evidence for developing countries' in *Eastern Economic Journal*, vol. 25, no. 3, pp. 301–313.
- Deléchat, C. and L. Medina (2020). 'What Is the Informal Economy?' in *Finance and Development*, December 2020. Washington, D.C.: International Monetary Fund.
- Demographic Dividend website. Available at: <<https://demographicdividend.org/>>.
- Dollar, D. and A. Kraay (2001). 'Growth is Good for the Poor', Policy Research Working Paper 2587. Washington, D.C.: World Bank.
- Eastwood, R. and M. Lipton (2000). 'Pro-poor Growth and Pro-growth Poverty Reduction: Meaning, evidence and policy implications' in *Asian Development Review*, vol. 18, no. 2, pp. 22–58.
- Enders, W. and G. Hoover (2003). 'The Effect of Robust Growth on Poverty: A nonlinear analysis' in *Applied Economics*, vol. 35, no. 9, pp.1063–1071.
- Furuoka, F. (2005). 'Population Growth and Economic Development: A case study of Malaysia' in *Journal of Population and Social Studies*, vol. 14, no. 1, pp. 47–66.
- Galor, O. (2012). 'The Demographic Transition: Causes and consequences', *Cliometrica*, vol. 6. pp. 1–28.
- Gleditsch, R.F. and A. Syse (2020). 'Ways to Project Fertility in Europe. Perceptions of current practices and outcomes', Discussion paper 929. Oslo: Statistics Norway.

- Grover, D. (2014). 'What is the Demographic Transition Model?', Population Education. Available at <[https://populationeducation.org/what-demographic-transition-model/#:~:text=The%20Demographic%20Transition%20Model%20\(DTM,as%20that%20country%20develops%20economically](https://populationeducation.org/what-demographic-transition-model/#:~:text=The%20Demographic%20Transition%20Model%20(DTM,as%20that%20country%20develops%20economically)>.
- Harasty, C. and M. Ostermeier (2020). *Population Ageing: Alternative measures of dependency and implications for the future of work*, ILO Working Paper 5. Geneva: International Labour Organization. Available at <https://www.ilo.org/employment/Whatwedo/Publications/working-papers/WCMS_747257/lang--en/index.htm#:~:text=As%20a%20direct%20consequence%20of,global%20labour%20force%20by%202030>.
- Hutton, G. and M. Varughese (2016). *The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation and Hygiene*. Washington, D.C.: World Bank.
- International Labour Organization (n.d.). 'Informal Economy: A hazardous activity'. Available at: <https://www.ilo.org/safework/areasofwork/hazardous-work/WCMS_110305/lang--en/index.htm,%202022>.
- IPUMS International (n.d.). Zanzibar 1998 census, raw data. Available at <<https://international.ipums.org/international/index.shtml>>.
- Jimeno, E., J. Domènech and D. Belo (2020). *The Impact of Ageing on the Labour Force and Productivity: Six of one, half a dozen of the other*. Caixa Bank Research. Available at: <<https://www.caixabankresearch.com/en/economics-markets/labour-market-demographics/impact-ageing-labour-force-and-productivity-six-one>>.
- Juma, S. (2018). *Developing Inclusive Education Policy and Practice in Zanzibar: Collaborative action research*. Jyväskylä, Finland: University of Jyväskylä.
- Klasen, S. (2004). 'In Search of the Holy Grail: How to achieve pro-poor growth?' in *Toward Pro Poor Policies-Aid, Institutions and Globalization*, edited by B. Tungodden, N. Stern and I. Kolstad. New York: Oxford University Press.
- Lam, D. and L. Marteleto (2008). 'Stages of the Demographic Transition from a Child's Perspective: Family size, cohort size and children's resources' in *Population Development Review*, vol. 38, no. 2, pp. 225–252.
- Lee, R. and A. Mason (2006). 'What Is the Demographic Dividend?' in *Finance and Development*, vol. 43, no. 3. Washington. D.C.: International Monetary Fund.
- Lee, R. and A. Mason (2017). 'Cost of Aging' in *Finance and Development*, vol. 54, no. 1. Washington. D.C.: International Monetary Fund.
- Ministry of Education and Vocational Training (n.d.). *Zanzibar Education Development Plan II 2017/18–2021/22*. Zanzibar: Revolutionary Government of Zanzibar.
- Ministry of Health (2013). *Zanzibar Health Sector Strategic Plan III 2013/14–2018/19*. Zanzibar: Revolutionary Government of Zanzibar.
- Ministry of Health (2017). 'Report on the Mid-Term Review Zanzibar Health Sector Strategic Plan-III: 2013/14–2018/19'. Zanzibar: Revolutionary Government of Zanzibar.
- Ministry of Health (n.d.). 'National Health Accounts: Healthcare expenditure for FY 2017/2018'. Zanzibar: Revolutionary Government of Zanzibar.
- Ministry of Health, Community Development, Gender, Elderly and Children, et al. (2016). *Tanzania Demographic and Health Survey and Malaria Indicator Survey (TDHS-MIS) 2015–2016*. Dar es Salaam, Tanzania and Rockville, Maryland, USA: MoHCDGEC, MoH, NBS, OCGS and ICF. Available at: <<https://dhsprogram.com/pubs/pdf/FR321/FR321.pdf>>.
- Ministry of Labour, Youth, Women and Children Development (2007). 'Zanzibar Youth Employment Action Plan'. Zanzibar: Revolutionary Government of Zanzibar.
- Moreland, S. et al. (2014). *Modeling the Demographic Dividend: Technical guide to the DemDiv model*. Washington, DC: Futures Group, Health Policy Project. Available at: <http://www.healthpolicyproject.com/pubs/343_FINALDemDivTechnicalReportFINALEC.pdf>.
- National Bureau of Statistics (2006). *Analytical Report: Volume X*. Dar es Salaam: United Republic of Tanzania.
- National Bureau of Statistics and Office of the Chief Government Statistician (2013). *2012 Population and Housing Census: Population distribution by administrative areas*. Dar es Salaam: United Republic of Tanzania. Available at:

- <http://tanzania.countrystat.org/fileadmin/user_upload/countrystat_fenix/congo/docs/Census%20General%20Report-2012PHC.pdf>.
- National Bureau of Statistics and Office of the Chief Government Statistician (2018). *National Population Projections*. Dar es Salaam: United Republic of Tanzania.
- National Bureau of Statistics and Office of the Chief Government Statistician (2021). *Integrated Labour Force Survey 2020/21: Key labour market indicators for the United Republic of Tanzania*. Dar es Salaam: United Republic of Tanzania.
- National Bureau of Statistics and ORC Macro (2005). *Tanzania Demographic and Health Survey 2004–2005*. Dar es Salaam, Tanzania: NBS and ORC Macro. Available at <<https://dhsprogram.com/pubs/pdf/FR173/FR173-TZ04-05.pdf>>.
- Office of the Chief Government Statistician (2015). *Zanzibar Socio-Economic Survey 2014*. Zanzibar: OCGS.
- Office of the Chief Government Statistician (2016). *Zanzibar Integrated Labour Force Survey 2014: General report*. Zanzibar: Revolutionary Government of Zanzibar.
- Office of the Chief Government Statistician (2021a). 'Education Sector Performance 2021'. Zanzibar: OCGS.
- Office of the Chief Government Statistician (2021b). 'Zanzibar Economic Survey 2020'. Zanzibar: OCGS.
- Office of the Chief Government Statistician (2021c). *Zanzibar in Figures 2020*. Zanzibar: Revolutionary Government of Zanzibar.
- Office of the Chief Government Statistician (n.d.). *2006 Integrated Labour Force Survey*. Zanzibar: Revolutionary Government of Zanzibar.
- Organization of Economic Cooperation and Development (2015). *Building more effective, accountable and inclusive institutions for all*, OECD and Post-2015 Reflections, Element 6, Paper 1. Paris: OECD Publishing.
- Organization of Economic Cooperation and Development, and International Labour Organization (2019). 'Risks and vulnerabilities in the informal economy' in *Tackling Vulnerability in the Informal Economy*. Paris: OECD Publishing. Available at: <<https://www.oecd-ilibrary.org/docserver/2cfd8904-en.pdf?expires=1667397313&id=id&accname=guest&checksum=2ADB9DEBCB1C7996EDF99EF1A3CFF4A4>>.
- Patierno, K., S. Gaith and E.L. Madsen (2019). *Which policies promote a demographic dividend?: An evidence review*. Washington D.C.: Population Reference Bureau.
- Pegou, S. and C. Chiatchoua (2020). 'The Long Run Relationship between Population Growth and Economic Growth: A panel data analysis of 30 of the most populated countries of the world in *Panorama Económico*, vol. 31, pp. 205–218.
- Policy, Advocacy, and Communication Enhanced for Population and Reproductive Health (n.d.). 'The Four Dividends: How age structure change can benefit development'. Available at <https://www.prb.org/resources/the-four-dividends-how-age-structure-change-can-benefit-development/>.
- Revolutionary Government of Zanzibar (2007). *Zanzibar Strategy for Growth and Reduction of Poverty (ZSGRP)*. Zanzibar: RGoZ.
- Revolutionary Government of Zanzibar (2020). *Zanzibar Development Vision 2050*. Stone Town: RGoZ. Available at <<http://extwprlegs1.fao.org/docs/pdf/tan205723.pdf>>.
- Revolutionary Government of Zanzibar (n.d.). *Zanzibar Investment Guide 2019–2020*. Zanzibar: RGoZ.
- Saleh, F. et al. (2021). *Emerging Epidemics: Is the Zanzibar healthcare system ready to detect and respond to mosquito-borne viral diseases?* BMC Health Services Research. Available at: <<https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-021-06867-6#citeas>>.
- Sengupta, T. (n.d.). 'Demographic transition model (DTM)', Budding geographers website. Available at <https://www.buddinggeographers.com/demographic-transition-model-dtm/>.
- Serra, R. (2004). *The Demographic Context and Its Implications for Childhood Poverty*, CHIP Report No. 5. London: Childhood Poverty Research and Policy Centre.

- Squire, L. (1993). 'Fighting Poverty' in *American Economic Review*, vol. 31, no. 7, pp. 377–382.
- Stevans, L. and D. N. Sessions (2005). *The relationship between poverty, economic growth, and inequality revisited*. University Library of Munich. Available at: <<https://ideas.repec.org/p/wpa/wuwpgge/0502002.html>>.
- Thornton, J., R. Agnello and C. Link (1978). 'Poverty and Economic Growth: Trickle down peters out' in *Economic Inquiry*, vol 16., no. 3, pp. 385–394.
- United Nations (2020). 'SDG Indicators: Metadata Repository'. Available at <<https://unstats.un.org/sdgs/metadata/>>.
- United Nations Children's Fund (2015). 'Without toilets, childhood is even riskier due to malnutrition'. Press release. Available at <<https://www.unicef.org/tanzania/press-releases/unicef-without-toilets-childhood-even-riskier-due-malnutrition>>.
- United Nations Children's Fund (2017). *WASH Guidelines: Choosing public expenditure analytical tools for use in the WASH sector*. Available at: <<https://www.unicef.org/sites/default/files/2019-12/WASH-Guidelines-Choosing-Public-Expenditure-Analytical-Tools-Use-in-WASH-Sector-2017.pdf>>.
- United Nations Children's Fund (2019a). *Harnessing the Demographic Dividend in Uganda: An assessment of the impact of multisectoral approaches*. Kampala: UNICEF Uganda.
- United Nations Children's Fund (2019b). *MENA Generation 2030: Investing in children and youth today to secure a prosperous region tomorrow*. Amman, Jordan: UNICEF. Available at: <<https://www.unicef.org/media/56646/file/MENA%20generation%202030.pdf>>.
- United Nations Children's Fund and Revolutionary Government of Zanzibar (2018a). *Education Budget Brief 2018: Zanzibar*. UNICEF and RGoZ. Available at: <<https://www.unicef.org/tanzania/media/1306/file/UNICEF-Zanzibar-2018-Education-Budget-Brief.pdf>>.
- United Nations Children's Fund and Revolutionary Government of Zanzibar (2018b). *Health Budget Brief 2018: Zanzibar*. Zanzibar: UNICEF and RGoZ. Available at: <<https://www.unicef.org/tanzania/media/1321/file/UNICEF-Zanzibar-2018-Health-Budget-Brief.pdf>>.
- United Nations Children's Fund and Revolutionary Government of Zanzibar (2021a). *Education Budget Brief 2019/2020: Zanzibar*. Available at <<https://www.unicef.org/esa/media/8446/file/UNICEF-Tanzania-Zanzibar-2020-Education-Budget-Brief-revised.pdf>>.
- United Nations Children's Fund and Revolutionary Government of Zanzibar (2021b). *Health Budget Brief 2019/2020: Zanzibar*. Available at <<https://www.unicef.org/esa/media/8441/file/UNICEF-Tanzania-Zanzibar-2020-Health-Budget-Brief-revised.pdf>>.
- United Nations Committee for Development Policy (2021). *List of Least Developed Countries (as of 24 November 2021)*. Available at https://www.un.org/development/desa/dpad/wp-content/uploads/sites/45/publication/ldc_list.pdf.
- United Nations Department of Economic and Social Affairs (2019a). 'World Population Prospects 2019'. Available at <<https://www.un.org/development/desa/pd/news/world-population-prospects-2019-0>>.
- United Nations Department of Economic and Social Affairs (2019b). 'Definition of projection variants'. Available at <https://population.un.org/wpp/DefinitionOfProjectionVariants/>.
- United Nations Educational, Scientific and Cultural Organization (2021). 'How water, sanitation and hygiene contribute to girls' education in Tanzania'. Available at: <<https://www.unesco.org/en/articles/how-water-sanitation-and-hygiene-contribute-girls-education-tanzania>>.
- United Nations Educational, Scientific and Cultural Organization (n.d.). 'Institute for Statistics Database'. Available at <<http://data.uis.unesco.org/>>.
- United States Agency for International Development (n.d.). 'STAT compiler: The DHS Program'. Available at <<https://www.statcompiler.com/en/>>.
- Wallace, G. and R. Blank (1999). 'What Goes Up Must Come Down: Explaining recent changes in public assistance caseloads' in *Economic Conditions and Welfare Reform*, edited by S. H. Danziger. Kalamazoo, Michigan: Upjohn Institute for Employment Research.

- World Bank (2017). *Zanzibar Poverty Assessment*. Washington D.C.: World Bank.
- World Bank (2019). 'Zanzibar Energy Sector Transformation Project (P169561)'. Project Information Document.
- World Bank (2020). *Tackling the Demographic Challenge in Uganda*. Washington D.C.: World Bank.
- World Bank (2021). 'World Development Indicators'. Available at <<https://datatopics.worldbank.org/world-development-indicators/>>.
- World Bank and International Monetary Fund (2016). *Global Monitoring Report 2015/2016: Development goals in an era of demographic change*. Washington D.C.: World Bank.
- World Economic Forum (2017). *The Global Competitiveness Report 2017–2018*. Geneva: WEF. Available at <https://www3.weforum.org/docs/GCR2017-2018/05FullReport/TheGlobalCompetitivenessReport2017%E2%80%932018.pdf?_gl=1*1cyeo6c*_up*MQ..&gclid=Cj0KCQjwqoibBhDUARIsAH2OpWj-gRAaVWBBIoSNzFc1_7tgV95swNvB5R_3vuNQeeFPO3II64BC3zcaAjXnEALw_wcB>.
- World Economic Forum (n.d.). *A 3E Policy Framework to Reap the Demographic Dividend: Empower, educate, employ*. WEF. Available at <<https://esaro.unfpa.org/sites/default/files/pub-pdf/The%20Es%20policy%20framework%20to%20reap%20the%20demographic%20dividend%20Empower%20employ%20educate.pdf>>.
- World Health Organization (2016). *Global Strategy on Human Resources for Health: Workforce 2030*. Geneva: WHO.
- World Health Organization (2021a). 'Maternal, Newborn, Child and Adolescent Health and Ageing: Data portal'. Available at: <[https://www.who.int/data/maternal-newborn-child-adolescent-ageing/indicator-explorer-new/mca/uhc-service-coverage-index-\(sdg-3.8.1\)](https://www.who.int/data/maternal-newborn-child-adolescent-ageing/indicator-explorer-new/mca/uhc-service-coverage-index-(sdg-3.8.1))>.
- World Health Organization (2021b). 'The Global Health Observatory: UHC index of service coverage (SDG 3.8.1)'. Available at <<https://www.who.int/data/gho/data/indicators/indicator-details/GHO/uhc-index-of-service-coverage>>.
- Yu, S. and F. Ohnsorge (2019). 'The challenges of informality', World Bank Blogs. World Bank. Available at <<https://blogs.worldbank.org/developmenttalk/challenges-informality>>.
- Yussuf, I. (2015). 'Zanzibar: Desalination – A solution to water shortage?'. Unrepresented Nations and Peoples Organization. Available at: <https://unpo.org/article/18056>.
- Zanzibar Utilities Regulatory Authorities (2017). *Strategic Plan 2017–2022*. Zanzibar: ZURA.
- Zanzibar Water Authority (2020). 'About Us', Zanzibar Water Authority. Available at <<https://www.zawa.go.tz/>>.

