

Assessment of Knowledge Society Development in Malawi

June 2017

African Leadership in ICT (ALICT)

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June 2017



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Published by:
Global e-Schools and Communities Initiative (GESCI)
Unga House,
Muthithi Road, Westlands
Nairobi, Kenya
www.gesci.org

GESCI. 2017. *Botswana Country Report*. Nairobi, Kenya: GESCI
Third Edition

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Acknowledgements

We would like to acknowledge and thank stakeholders from Ministries of Education, Information Communication Technology, Science Technology & Innovation and others who gave their time to participate in this study. Whether in surveys, focus groups or interviews, your commitment and contributions have been invaluable.

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Introduction

The Global E-Schools and Communities Initiative (Gesci), in collaboration with the African Union Commission (AUC) and other partners, developed an African Leaders in ICT (ALICT) capacity-building programme. The first phase of the programme ran from 2012-2013, focusing on leadership capacity-building in twelve countries (Botswana, Ethiopia, Kenya, Malawi, Mauritius, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Uganda, and Zambia). A second phase of the programme ran between 2014 and 2016 and included four countries (Ghana, Ivory Coast, Morocco, and Senegal). ALICT has built the capacities of 487 mid and senior government leaders in 16 Anglophone and Francophone African countries, as well as officials from the AUC between 2012 to 2015. The Francophone version of the ALICT Programme is referred to as *the Leadership Africain pour les TIC et le développement de la société du savoir (LATIC)*.

The course presented a multi-stakeholder approach for awareness-raising and capacity-building of African leaders around issues of Knowledge Society (KS), Information, Communication Technologies (ICT), Education, and Science Technology and Innovation (STI) in support of the AUC Action Plan and the EU-AU P8. Courses comprised of contextualized, modular content, founded upon country research and reflecting the identified needs of country governments.

The programme is currently under review to integrate leadership for sustainable development components in line with international frameworks and AU continental strategies for achieving 2030 sustainable development goals and objectives. The focus is on a continent-wide expansion of the programme through a wider access model.

Aims and Objectives of the study

To inform future development of the ALICT programme, it is important to understand where the participating countries are at in terms of developing a KS. Thus, Gesci commissioned Neil Butcher and Associates to prepare updates on the status of the KS in the 16 participating countries. Specifically, the focus was to update the situational and needs analysis of each country to keep abreast of developments since 2013 regarding the KS and its pillars of Education, STI, and ICT.

The specific objectives of the study were to:

- Update briefs of country KS pillars for the ALICT-LATIC Database.
- Update the ALICT KS country study database of the KS pillar status in each country, which involved:
 - Desk review of country KS documentation, identifying essential policies, strategies, plans, and papers on KS;
 - Review of KS pillar documentation sets related to Education, ICT, and STI; and
 - Identification of major actors, stakeholders, and partners and their role in KS pillar development.

Methodology

The report methodology involved a desk review of various government policy and strategy documents. Additionally, documents from development partners, research and academic papers, news articles, websites, and publications from various organizations were consulted. Further, data from the 2013 report were included where relevant. A framework for the country reports was

prepared, outlining what the various sections would cover. This was done to ensure uniformity in the type of information collected. The major areas and themes covered included policies and plans in ICT, Education, and STI. Additionally, socio-economic background information and indicators were reviewed to obtain an understanding of the context of each country. After receiving approval from Gesci for this framework, draft reports were prepared for each of the 16 countries. The reports were sent to Gesci for review and, based on feedback received, the reports were then finalized.

Overview of theoretical model

Modern economies are transforming from agricultural and industrial economies to information and knowledge-based economies. Such rapid transformation has had significant impact on social, economic, political, and cultural development across the world. For such development and growth, ICT is seen as both a driver and an enabler towards establishing and developing the various sectors in an economy that contribute to stronger, more developed, and richer societies. Africa is on a journey of transformation towards information and knowledge societies. During any such transformational journey, the leaders of a society and policy makers are likely to undergo a paradigm shift that involves developing their capacity and providing tools and direction for accepting relevant changes in mindset.

Dahlman (2011) defines a KS as a society that values the creation, dissemination, and effective use of knowledge, and has the institutions, infrastructure, norms, social interactions, and culture that support this.¹ UNESCO (2005) describes a KS as one that is nurtured by its diversity and its capacities. It further argues that, in the increasingly knowledge-based world, it is critical to embrace knowledge and innovation-related policies to spur competitiveness, growth, and improvements in welfare.²

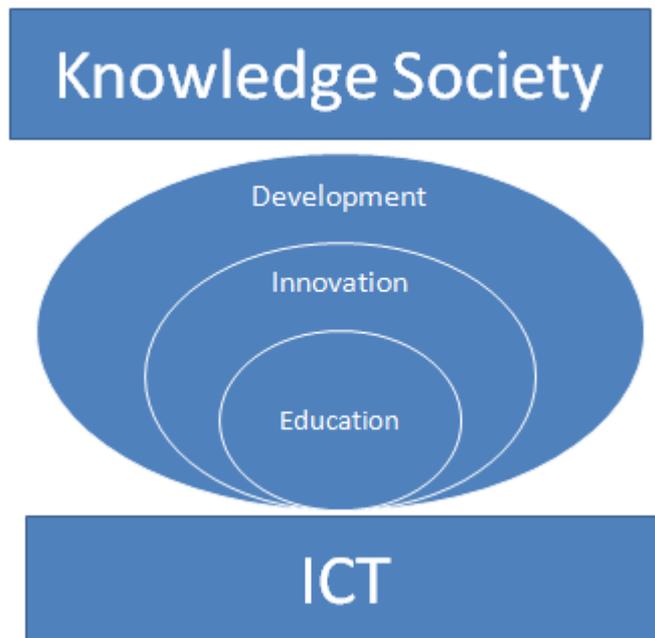
Gesci believes that ICT, education, and innovation are the critical pillars and key elements for development towards a knowledge-based future. Butcher (2010) visually captured the inter-relationship between the three pillars as follows:

¹ Dahlman, C. J. (2011). What is the Knowledge Economy and Society and How Can it Help Jamaica? Retrieved July 17, 2017 from

http://www.knowledgesocietyfoundation.com/images/Dahlman_C_2011_What_is_the_Knowledge_Economy_and_Society_-_How_can_it_help_Jamaica,_Jam_KE_C_Conf,_Ssn_1-2.pdf

² UNESCO. (2005). Towards Knowledge Societies. Retrieved July 17, 2017 from <http://unesdoc.unesco.org/images/0014/001418/141843e.pdf>

Figure 1 Framework for reflecting on ICT, Education, Innovation and Development Support of a Knowledge Society³



The innovation pillar incorporates the fields of Science, Technology, and Innovation (STI) in a single pillar. The education and innovation pillars are presented as interrelated drivers for development. The ICT pillar is the enabler for Education and Innovation dynamics that will drive Development towards the Knowledge Society.⁴

ICT is regarded as an engine for growth and a tool for empowerment, which has profound implications for education change and socio-economic development. UNESCO (2007) defines ICT as *Forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means. This broad definition of ICT includes technologies such as radio, television, video, DVD, telephone (both fixed line and mobile phones), satellite systems, and computer and network hardware and software, as well as the equipment and services associated with these technologies, such as videoconferencing, e-mail and blogs.*⁵

ICT is considered a critical tool in preparing students with the skills required for the global workplace. Thus, technology integration is becoming a key element in almost every plan for the restructuring and re-engineering of education systems.⁶ This enables continuous adaptation to a

³ Neil Butcher and Associates. (2011). Thematic Paper: ICT, Education, Development, and the Knowledge Society. Gesci. Retrieved July 17, 2017 from http://gesci.org/fileadmin/user_upload/4_ICT_in_STEM_Education_Files/ICT_Education_Development_and_the_Knowledge_Society_1_1_.pdf

⁴ Hooker, M. (2011). African Leadership in ICT and Knowledge Societies: Issues, Tensions and Opportunities for Learning for Gesci. Retrieved July 17, 2017 from http://gesci.org/fileadmin/user_upload/1_African_Leadership_in_ICT_and_Knowledge_Society_Development_Files/2013_-_african-leadership-knowledge-societies-issues-tensions-opportunities-learning.pdf

⁵ UNESCO Bangkok. (2007). The UNESCO ICT in Education Programme. p.1. Retrieved July 17, 2017 from <http://unesdoc.unesco.org/images/0015/001567/156769e.pdf>

⁶ Scheffler, F.L., and Logan, J.P. (1999). Computer Technology in Schools: What Teachers Should Know and Be Able to Do. Journal of Research on Computing in Education, Vol 31, Issue 3. Available from <http://www.tandfonline.com/doi/abs/10.1080/08886504.1999.10782257>

work world of continuous technological innovations and makes it easier for students to access knowledge.

Challenges of ICT within Africa often relate to lack of human and financial resources, which translate into inadequate and insufficient skills supply, irrelevant or incomplete regulatory frameworks, including policies and legislation, and inadequate infrastructure and communication platforms.⁷ To embrace a KS, Gesci believes that there is a requirement to ensure that leaders develop skills to make informed policy and investment decisions to support socio-economic development effectively. This encompasses building both leadership ICT skills and ICT management skills.

Lifelong learning is regarded as a requirement to keep pace with the constantly changing global job markets and technologies. Education contributes to all other sectors by providing required skills and knowledge for economic development. Thus, it is not limited to formal education in traditional structures, but encompasses the broader societal learning necessary for development. Preparation for lifelong learning involves an emphasis, in primary and secondary schools, on learning general skills and competencies (communication, mathematics and science skills, new literacy skills, problem-solving and interpersonal skills, and self-directed learning skills to learn other subjects) and at tertiary level on capacity-building in science and technology, discipline-specific skills, research, and development.⁸ Additionally, there is a need for postgraduate programmes to build specific research capacity to handle knowledge-innovation process development – to meet needs and demands for national and regional competitiveness and growth. Education plays critical roles in imparting learning skills.⁹

Innovation is described as a process of creation, exchange, evolution, and application of knowledge to produce new goods. It involves adapting, adopting, or using knowledge to produce new goods and services in local contexts or to advance society in general.¹⁰ The UN Economic Commission for Africa (UNECA) (2010) regards innovation and change as fundamental when developing a KS to drive economic growth and advancement. It has been argued that the basic ingredient for nurturing the innovation dynamic is setting up systems to enable cross-fertilization of ideas between the fields of Science, Engineering, Technology, and Innovation (SETI).¹¹

Overview of the ALICT-LATIC programme

The ALICT Programme is conceptualized to model a methodology and multi-stakeholder approach for capacity building and awareness raising of African leaders on the issues of the KS, ICT, Education, and STI.¹² The programme is based on the premise that investments in ICT, Education, and STI contribute to socio-economic development and a shift towards the development of a KS.

The programme's focus is to build absorptive capacity of current and potential future African leaders to acquire, assimilate, transform, and exploit the benefits of knowledge. It aims to foster dynamic

⁷ Hooker, M. (2011). African Leadership in ICT and Knowledge Societies: Issues, Tensions and Opportunities for Learning for Gesci. Op cit

⁸ Neil Butcher and Associates. (2011). Thematic Paper: ICT, Education, Development, and the Knowledge Society. Op cit

⁹ Hooker, M. African Leadership in ICT and Knowledge Societies: Issues, Tensions and Opportunities for Learning for Gesci. Op cit

¹⁰ Hooker, M. (2010). Concept note: Building Leadership Capacity for ICT and Knowledge Societies in Africa. Gesci. Retrieved July 17, 2017 from http://gesci.org/fileadmin/user_upload/1_African_Leadership_in_ICT_and_Knowledge_Society_Development_Files/2012_-_ConceptNoteALICTFinal.pdf

¹¹ Hooker, M. (2011). African Leadership in ICT and Knowledge Societies: Issues, Tensions and Opportunities for Learning for Gesci. Op cit

¹² *ibid*

organizational capability through knowledge sharing, collaboration, and exposure to technology. It is hoped that, through participation in the ALICT-LATIC course, future African leaders will demonstrate knowledge, skills, and attitudes that promote their role as change agents. These are expected to translate into positive benefits for their respective countries in pursuit of inclusive knowledge societies.

The core concepts of the programme are as follows:

- **Capacity Building:** The ALICT capacity-building model aims to build and enhance the knowledge, skills, and attitudes of future leaders to manage transformation and change, manage institutional pluralism, enhance coordination, foster communication, and ensure that data and information are shared and used in planning, resource mobilization, implementation, and evaluation processes.
- **Knowledge Society:** The ALICT model focuses on the role all facets of ICT play in building the absorptive capacities of current and potential future African leaders to acquire, assimilate, transform, and exploit the benefits of ICT and knowledge to produce a dynamic organizational capability through peer knowledge sharing and exposure to technology. The ALICT approach to KS development focuses on the interconnection between leadership, policy development, and future-proof planning and how they contribute to KS development through Education, STI, and ICT.
- **Leadership:** A prerequisite for leadership development for knowledge societies is policy coherence between the three pillars (ICT, Education, and STI) that form the basis of any KS. For future African leaders to be able to steer their countries towards that goal, it is essential for them to not only be well versed in management, leadership, project formulation and project management skills, but also to acquire comprehensive knowledge about the interrelationship of the three KS pillars (Education, STI and ICT) and then be able to apply that knowledge in the African context.
- **Policy Coherence:** Policy coherence is the development and implementation of conjointly supportive policy actions across all sectors of the economy and society and, more specifically across government departments and agencies. Policy coherence pursues the creation of synergies across policies that advance the achievement of shared and agreed objectives. Within national governments, policy coherence issues arise between different types of public policies, between different levels of government, between different stakeholders, and at an international level.
- **Futures Thinking:** Futures Thinking was first theorized by Jim Dator (Bezold, 2009). Among its many uses within complex and rapidly shifting economic and social systems is its relevance to policy development and implementation. Futures Thinking requires the revisitation of plans and policies at regular intervals to take into consideration any new signals that appear in the environment that may affect a sector or number of sectors.¹³

Considering Sustainable Development Goals

The 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development officially came into force in January 2016. These new goals apply to all countries when mobilizing efforts to end all forms of poverty, fight inequalities, and tackle climate change over the next 15 years.

¹³ Taken verbatim from African Leadership in ICT Model Document 2013 - The Future of African Leadership is here. Retrieved July 17, 2017 from http://gesci.org/fileadmin/user_upload/1_African_Leadership_in_ICT_and_Knowledge_Society_Development_Files/ALICT_Model_final_Juho.pdf

They recognize that ending poverty must go hand-in-hand with strategies that build economic growth and addresses a range of social needs including education, health, social protection, and job opportunities, while tackling climate change and environmental protection.¹⁴

While the SDGs are not legally binding, governments are expected to take ownership of, and establish national frameworks to achieve, the 17 Goals: no poverty; zero hunger; quality education; gender equality; clean water and sanitation; affordable and clean energy; decent work and economic growth; industry, innovation and infrastructure; reduced inequalities; sustainable cities and communities; responsible consumption and production; climate action; life below water; life on land; peace, justice, and strong institutions; and partnerships for the goals.

Primary responsibility for follow-up and review of progress made in implementing the SDGs rests with countries. Implementation and success of the SDGs depends on countries' own sustainable development policies, plans, and programmes. However, regional follow-up and review will be based on national-level analyses and contribute to follow-up and review at the global level.¹⁵

Whilst implementation of SDGs is still in early phases, it provides an opportunity to frame the ALICT programme as a mechanism for countries to address SDGs, due to the programme's cross-cutting nature. Specifically, KS development relies on the progress made in many of the SDGs.

¹⁴ United Nations. (no date) Sustainable Development Goals – 17 Goals to Transform our World. Retrieved July 17, 2017 from <http://www.un.org/sustainabledevelopment/development-agenda/>

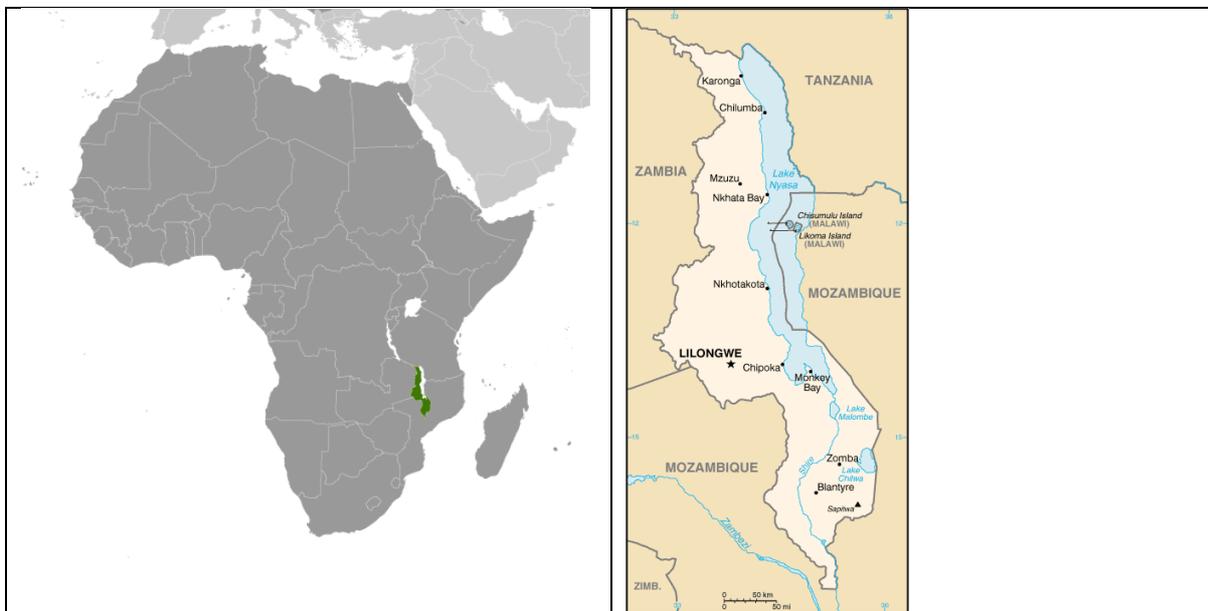
¹⁵ Ibid

Knowledge Society Development in Malawi

1. Introduction

Malawi is a landlocked country situated in south-east Africa, and is bordered by Mozambique, Zambia, and Tanzania. Lake Malawi, which flows through from the north to south of the country, comprises of 20% of Malawi's total surface area. Having gained independence from the British in 1964, Malawi fell under one-party rule under President Hastings Kamuzu Banda for three decades. In 1994, the country held its first multiparty presidential and parliamentary elections.¹⁶ Following the end of the one-party political regime in 1993, Malawi has had a fairly stable democratic government. It has held five peaceful democratic parliamentary and presidential elections. The current president Prof. Arthur Peter Mutharika is the head-of-state whose five-year term will end in 2019 when the next presidential elections will be held.¹⁷

Figure 2 Map of Malawi¹⁸



Malawi is rated as one of the most densely populated nations in sub-Saharan Africa with a population of 18,570,321 in 2016.¹⁹ Lilongwe is the capital city of Malawi; however, Blantyre continues to be the commercial hub. Malawi is a member of the Southern African Development Community (SADC) and Common Market for Eastern and Southern Africa (COMESA) regional integration groups of countries in Africa. The official languages spoken in Malawi are English and Chichewa. The Chewa is the largest ethnic group (33%) followed by Lomwe (18%), the Yao (14%), Ngoni (12%) and other smaller tribes.²⁰

¹⁶ CIA The World Factbook. (2017). Malawi. Retrieved May 26, 2017 from <https://www.cia.gov/library/publications/the-world-factbook/geos/mi.html>

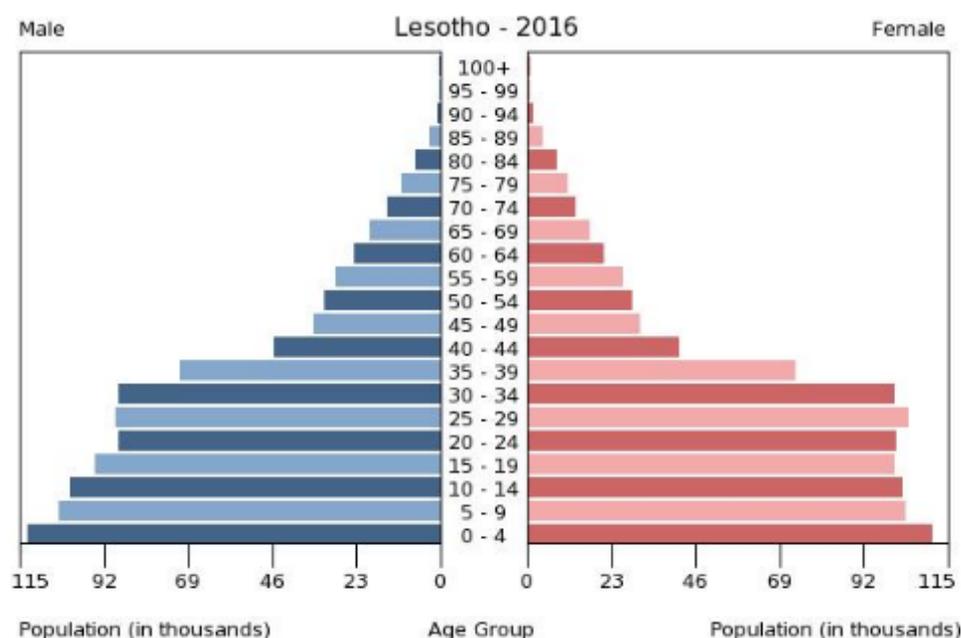
¹⁷ World Bank. (2017). Malawi Overview. Retrieved June 2, 2017 from <http://www.worldbank.org/en/country/malawi/overview>

¹⁸ CIA The World Factbook. (2017). Malawi. Op cit

¹⁹ World Bank. (2015). Population, total – Malawi. Retrieved February 28, 2017 from <http://data.worldbank.org/indicator/SP.POP.TOTL?locations=MW>

²⁰ CIA The World Factbook. (2017). Malawi. Op cit

Figure 3 Population Pyramid for Malawi²¹



The population pyramid above illustrates the age profile of Malawians by gender. The majority of the population is relatively young. Of the entire population, 37.58% is between the age of 25 and 54. The average age for a woman giving birth for the first time is 21 while life expectancy at birth is 52.9 years for males and 53.1 years for females. According to 2015 estimates, the literacy rate – that is, the population over the age of 15 that can read and write – is 65.8% overall, which translates to 73% of males and 58.6% for females.²²

Table 1 below shows the socio-economic indicators for Malawi, which gives an indication of the country's current context

Table 1 Socioeconomic Indicators of Malawi²³

Socioeconomic Indicator	
Population	18,570,321 (2016)
Area	118,484 sq.kilometers
Population density	158 people /sq. km (2010)
GDP	US\$5,474 billion (2016)
GDP per capita	\$1,100 (2016)
GDP growth	2.7% (2016)
Birth rate	41.3 (per 1000 people) (2016)
Death rate	8.1 (per 1000 people) (2016)
Urban Population %	16.3%.(2015)
Urban Population Growth	3.77%
Life Expectancy at birth	61.2 years
Literacy rate (above age 15)	65.8% (2015)
Infant Mortality	44.8 (per 1000 births)

²¹ Ibid

²² Ibid

²³ Ibid

Socioeconomic Indicator	
Education Expenditure	5.6% of GDP (2015)
HIV and AIDS Prevalence	9.11% (adult population)

The employment to population rate for men and women in 2016 was 76% for the population over the age of 15.²⁴ The rate of unemployment in Malawi is 6.74% (2016) – a decrease from 7.8% in 2005.²⁵ Although this appears extremely low, it is important to take note of the fact that official “employment” in Malawi constitutes working at least one hour a week. This difference in measurement means that the employment statistics for the country are distorted compared to other countries’ rates of employment.²⁶ The labour market shows consistent discrimination toward women – the majority of whom (about 90%) work in rural areas in the informal sector. On the other hand, most women in the formal sector have low-paying jobs and have limited access to financial credit.²⁷

According to the United Nations, Malawi is on a list of the world's 48 least developed countries (LDC).²⁸ The country’s economic performance has historically been constrained by policy inconsistency, macroeconomic instability, limited connectivity to the region and the world, and poor health and education outcomes that limit labour productivity. Malawi’s Human Development Index is 0.476, which ranks them at 170 out of 188 countries.²⁹

In terms of the country’s political stability and governance, Malawi has an overall governance ranking of 17 out of 54 African countries, giving it a score of 56.6 out of 100. This score puts Malawi above the average score in Africa of 50.0, although it scores lower than the regional Southern African score of 58.3. The country’s highest score was in Participation and Human Rights, for which it scored 65.8, while its lowest scoring category was a score of 44.1 in Sustainable Economic Opportunity.³⁰

Malawi has made significant strides in issues such as maternal and child health – in urban and rural parts of Malawi, large numbers of women receive prenatal treatment as well as effective assistance with birth and a high proportion of children are vaccinated. The country has however, failed to reduce its high fertility rate by a significant margin– in the 1980’s, a woman would have seven children on average. This has reduced to an estimated 5.5 children per woman today. Despite this, contraceptives are becoming more widely used which helps women to plan their pregnancies more effectively.³¹

The International Labour Organization (ILO) notes that about 40% of Malawi’s population lives below the poverty line. Malawi is not connected to the regional power grid, meaning that 14.9 million

²⁴ Danish Trade Union, Council for International Development Corporation. (2016). Labour Market Profile: Malawi. Retrieved June 2, 2017 from http://www.ulandssekretariatet.dk/sites/default/files/uploads/public/PDF/LMP/Imp_malawi_2016_final_version1.pdf

²⁵ CIA The World Factbook. (2017). Malawi. Op cit

²⁶ International Labour Organization. (2011). Malawi Decent Work Country Programme. Retrieved June 2, 2017 from <http://www.ilo.org/public/english/bureau/program/dwcp/download/malawi.pdf>

²⁷ Danish Trade Union, Council for International Development Corporation. (2016). Labour Market Profile: Malawi. Op cit

²⁸ UNCTAD. (2011). United Nations Conference on Trade and Development – The Least Developed Countries Report 2011: The Potential Role of South-South Cooperation for Inclusive and Sustainable Development. Retrieved June 2, 2017 from http://unctad.org/en/docs/ldc2011_en.pdf

²⁹ African Development Bank. (2017). Malawi. Retrieved June 2, 2017 from <https://www.afdb.org/en/countries/southern-africa/malawi/>

³⁰ Mo Ibrahim Foundation. (2016). Ibrahim Index of African Governance – Malawi. Retrieved June 2, 2017 from <http://iiag.online/>

³¹ CIA The World Factbook. (2017). Malawi. Op cit

people do not have electricity and only 9% of the population have access to electricity (32% in urban areas and 4% in rural areas).³²

Regarding the country's aspiration to achieve its Millennium Development Goals (MDGs), three of the MDGs are related to health. These are MDG 4 – to reduce child mortality, MDG 5 – to improve maternal health and MDG 6 – to combat AIDS, malaria and other diseases. Since establishing the National Health Strategic Plan, Malawi has been able to reduce the incidences of infant and child mortality, pneumonia fatalities and maternal deaths, amongst other achievements. There is, however, a significant gap between rural and urban mortality rates. The Malawi National Human Development Report states that in line with achieving the MDGs, Malawi has seen positive economic growth despite below-average performance in areas like poverty reduction; food security and elimination of extreme hunger; child mortality; HIV and AIDS; and environmental sustainability. Moreover, there are still vast improvements to be made in areas such as gender parity and access to primary education.³³

Malawi's military is called the Malawi Defence Forces (MDF). The army includes an Air Wing and a Marine Unit. For voluntary military service, there is a minimum age of 18 with an initial engagement of 7 years of service for enlisted personnel and 10 years for officers. The country spent 0.93% of GDP on military services in 2012, and it ranks 104 compared to the rest of the world in this regard.³⁴

Economy

Malawi's currency is the kwacha. It is one of the poorest countries in the world.³⁵ The GDI per capita was \$1,100 in 2016,³⁶ while the income Gini Coefficient of the country – a measure of the deviation in distribution of income between countries where 0 is absolute equality and 100 is absolute inequality – was 43.9.³⁷ The country's economic growth remained restricted in 2016 at 2.7%, but is expected to improve in 2017 with a projected growth of 4%, followed by an expected increase to 5% in 2018.³⁸

The Malawian economy is mostly agricultural – about 80% of the population lives in rural areas and agriculture comprises about a-third of GDP, as well as 90% of export revenues. The agricultural industry employs 64% of the population, which is slightly dominated by women.³⁹ Malawi's main agricultural export product is tobacco, while other large earners are tea, cotton, sugar and coffee.⁴⁰ The tobacco industry and how it performs economically is vital to the country's short-term growth because tobacco makes up for more than half of exports. The economy is also dependent on sizeable contributions of economic support from the International Monetary Fund (IMF), the World Bank, and individual donor nations. In 2006, Malawi was approved for financial assistance under the Heavily Indebted Poor Countries (HIPC) programme.⁴¹ In 2016, amidst continued economic strife

³² Ibid

³³ United Nations Development Programme. (2015). Malawi National Human Development Report. Retrieved June 2, 2017 from <http://www.mw.undp.org/content/malawi/en/home/presscenter/articles/2016/07/24/malawi-national-human-development-report-2015/>

³⁴ CIA The World Factbook. (2017). Malawi. Op cit

³⁵ African Economic Outlook. (2016). Malawi. Retrieved June 5, 2017 from <http://www.africaneconomicoutlook.org/en/country-notes/malawi>

³⁶ CIA The World Factbook. (2017). Malawi. Op cit

³⁷ Human Development Reports. (2013). Income Gini Coefficient. Retrieved June 2, 2017 from <http://hdr.undp.org/en/content/income-gini-coefficient>

³⁸ African Economic Outlook. (2016). Malawi. Op cit

³⁹ Danish Trade Union, Council for International Development Corporation. (2016). Labour Market Profile: Malawi. Op cit

⁴⁰ World Bank (2012): Malawi Country Brief Retrieved June 2, 2017 from <http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/AFRICAEXT/MALAWIEXTN/0,,menuPK:355882~pagePK:141132~piPK:141107~theSitePK:355870,00.html>

⁴¹ CIA The World Factbook. (2017). Malawi. Op cit

stemming from drought, there was a 14% lower output of the main staple crop, maize. This led to Malawi having to import a substantial amount of maize at a greater cost in order to compensate for the supply gap. The drought also affected power supply in the country, reducing manufacturing.⁴²

As is true with almost all countries, Malawi was impacted by the 2008 Global Economic Crisis, which increased fertilizer prices. This affected the country's exports and reduced their profits. Despite this, Malawi recorded economic growth during that period due, in part, to an agricultural subsidy which was provided to ensure food security between 2005 and 2008. Subsequently, the Malawian government has emphasised agricultural development and food security, which has been successful in minimising food supply deficits.⁴³

According to the World Economic Forum, Malawi's Global Competitive Index scores it a 3.1, which places the country at 134 out of 138 countries. Some of the major problems that the Index outlines is a lack of infrastructure, it's technological readiness, and the size of its market. Some of the most problematic factors for doing business in Malawi are, in order of severity: access to financing, inflation and corruption.⁴⁴

⁴² African Economic Outlook. (2016). Malawi. Op cit

⁴³ International Labour Organization (ILO). (2011). Malawi Decent Work Country Programme 2011-2016. Retrieved June 2, 2017 from https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKEwjY4-We36PUAhWJicAKHb_EBDOQFggNMAA&url=http%3A%2F%2Fwww.ilo.org%2Fpublic%2Fenglish%2Fbureau%2Fprogram%2Fdwcp%2Fdownload%2Fmalawi.pdf&usg=AFQjCNGh0Vs8I3Z3DUalwg4I6vFMvGWfrom

⁴⁴ World Economic Forum. (2016). Global Competitiveness Index - Malawi. Retrieved June 2, 2017 from <http://reports.weforum.org/global-competitiveness-index/country-profiles/-economy=MWI>

Figure 4 Summary of Malawi's investment portfolio, 2013⁴⁵

No.	Prospect	Sector	Investment	Approx Value US\$ million
1	Open	Agro-processing	Sugarcane	70.0
2	Open	Agriculture	Pigeon peas	33.0
3	Afriseed Ltd	Agriculture	Seeds	22.0
4	Sunbird Hotels	Tourism	Eco-lodges	8.0
5	Mpatsa Holdings Ltd	Agriculture	Irrigation	7.0
6	Universal	Agro-processing	Soy bean processing	7.0
7	RAB Processors	Agro-processing	Soy beans	6.0
8	Mpatsa Holdings Ltd	Financial services	Commercial bank	5.0
9	NASCOMEX Ltd	Agro-processing	Input/output marketing	5.0
10	Pride Malawi	Financial services	Micro-finance	3.2
11	Skyband	Infrastructure / ICT	Fibre optic cables	3.0
12	Company X	Agro-processing	Groundnuts	2.2
13	BERL	Energy	Bio-energy	1.3
14	Paragon Ceramics Ltd	Tourism/Manufacturing	Lodge & pottery	1.0
15	Mpatsa Holdings Ltd	Agriculture	Fish cages	1.0
16	Beta Television	ICT	Commercial TV station	0.9
17	Eqnon Electricity Kiosks	Energy	Mobile electricity	0.4
18	Tafika Milling	Agro-processing	Baobab juice	0.3
19	Ink It Design & Print Press	Services	Printing press	0.3
20	Naturals	Agro-processing	Baobab juice	0.3
21	Waster Water Environment	Infrastructure / ICT	Water/waste services	0.3
22	Namiashi Lodge	Tourism	Lodge & pottery	0.1

In the *Doing Business* rankings, which measures how easy it is to start and run a local business in a given country, Malawi ranked 133 out of 190 countries. This places the country at 15 in Sub-Saharan Africa.⁴⁶ According to the 2017 Index of Economic Freedom, Malawi ranks at 149— one place ahead of Cameroon and one place behind Uzbekistan. This gives Malawi a score of 52.2 which is below the international average of 60.7. The score places the country at 33 in the regional rankings. Extrapolating from this, according to the index, Malawi is “mostly unfree”. The rankings show an international and regional increase in Malawi’s score by 0.4. The report points to very high government spending and a tax burden at 69.8 and 79.1 respectively. On the other hand, it scored particularly low for government integrity (31.3) and 33.5 for fiscal health.⁴⁷

Since 2009, Malawi has faced several challenges that have posed a threat to its development. These include a shortage of foreign exchange which has impacted on Malawi’s capacity to pay for its imports as well as fuel shortages which significantly affect transportation and productivity in all sectors. In late October 2013, the African Development Bank, IMF, several European countries and the United States (US) froze US\$150 million in direct budgetary support as a result of a high-level corruption scandal referred to as “Cashgate”. The reason given for freezing this large amount of money was that the financial management system and civil service in Malawi could not be trusted.

⁴⁵ UNESCO. (2014) Mapping Research and Innovation in the Republic of Malawi. Retrieved June 8, 2017 from <http://unesdoc.unesco.org/images/0022/002288/228807E.pdf>

⁴⁶ The World Bank. (2016). Doing Business. Retrieved June 2, 2017 from <http://www.doingbusiness.org/rankings>

⁴⁷ The Heritage Foundation. (2017). Malawi. Retrieved June 2, 2017 from <http://www.heritage.org/index/country/malawi>

The donor funds comprised nearly 40% of Malawi's budget, have been directed through non-governmental organizations (NGOs) operating in the country.⁴⁸

The Malawian government faces several challenges in attempting to develop the country. These include, but are not limited to, trying to develop a market economy, improving the educational system and facilities, tackling environmental problems that currently and will in the future pose a threat to the country, addressing the HIV and AIDS epidemic, prevailing over corruption, and appeasing their foreign donors on efforts to curb corruption.⁴⁹ These issues are compounded by a depreciating kwacha, high inflation rates, and high interest rates which constrain consumer and business confidence. In 2016, average annual headline inflation was 22.6%, a slight improvement on the previous years' 21%. Projections estimate that by the end of 2017, inflation will decrease to 16%, provided food supply normalizes, the kwacha stabilizes, and the country exercises fiscal discipline.⁵⁰

Services account for the largest portion of the country's GDP at 50.5%. This is followed by agriculture, which takes up 32% of their GDP, and industry, which comprises 17.5%.⁵¹ An estimated 52.4% of Malawians live below the poverty line.⁵²

Environment and Climate

The rapid growth of Malawi's population coupled with current population density is putting extreme pressure on the country's natural resources such as land, water, and food supply. Malawians are having to contend with smaller plot sizes and rising vulnerability to climate change, which both pose a threat to agricultural sustainability – a backbone of the economy, with an estimated 80% of the population being employed by the agricultural industry.⁵³

The country was able to reduce its CO2 emissions from their peak of 0.116 metric tons per capita in 1978 to 0.079 metric tons per capita in 2013.⁵⁴ One of Malawi's main environmental policies is the *National Environmental Policy* of 2004, which states that its overall goal is to promote sustainable social and economic development by responsibly managing the environmental and natural resources of Malawi. Amongst the specific policy goals outlined are to restore and maintain eco systems and ecological processes that are integral to the biosphere, to make sure that environmental and natural resource management coalesce with a decentralized governance system, and to develop and frequently update information systems that expedite local, national, and international planning.⁵⁵

The most recent environmental policy for Malawi from 2010 is entitled: *Malawi State of Environment and Outlook Report: Environment for Sustainable Economic Growth*. The comprehensive policy gives insight into the extent of the challenge to preserve the environment in the country. For example, it explains that Malawi has not been able to attain Millennium Development Goal 7B, which is that by 2010, a significant reduction in the loss of biodiversity was to be achieved. Instead, the policy states that the proportion of land area covered by forest declined from 41.4% in 1990 to 36.2% in 2005. The policy covers the following thematic areas: environment and the economy; population and human settlements; energy, industry and mining; health and environment; environmental education and public awareness; Land and Agriculture; biodiversity;

⁴⁸ African Economic Outlook. (2016). Malawi. Op cit

⁴⁹ CIA The World Factbook. (2017). Malawi. Op cit

⁵⁰ African Economic Outlook. (2016). Malawi. Op cit

⁵¹ CIA The World Factbook. (2017). Malawi. Op cit

⁵² Ibid

⁵³ Ibid

⁵⁴ World Bank. (2017). Malawi. Retrieved May 31, 2017 from <http://data.worldbank.org/country/malawi>

⁵⁵ Government of Malawi, Ministry of Natural Resources and Environmental Affairs. (2004). National Environmental Policy. Retrieved June 1, 2017 from <http://www.chmmw.org/publications/mwneep.pdf>

forest and woodlands; water resources; atmosphere and climate change; Exploring the Future of Malawi's Environment using Scenarios; and Policy Analysis and Options for Actions.⁵⁶

Malawi has to contend with several environmental issues, including:

- Deforestation because of a greater demand for arable land;
- Land degradation;
- Low community involvement and contribution to environmental and natural resource management;
- Water pollution from agricultural runoff – which is an increasing problem considering that the country is so greatly reliant on the agricultural sector;
- Poverty and increasing population density which puts a strain on natural resources;
- A higher inflation rate which reduces the impact of government spending on environmental preservation by making these measures more expensive.⁵⁷

CO2 emissions have dropped from 0.116 metric tons per capita in 1978 to 0.079 metric tons per capita in 2013. In an effort to curb the impact of humans and global warming on the world's climate, Malawi is a signatory to a number of international environmental agreements, such as the Climate Change-Kyoto Protocol, Desertification, Endangered Species, Marine Life Conservation, Ozone Layer Protection, and Wetlands agreements.

Policy Vision for the Future

Following Malawi's independence in 1964, it elected to address the development agenda through medium term ten-year plans. However, it was decided that a long-term approach would be beneficial for policy formulation, implementation, and outcomes. As such, the Vision 2020 document was launched in 1998. Vision 2020 is "long-term multi-sectoral approach" that arose from extensive consultations and nationwide workshops with a view to achieving national development in political, social, economic and technological areas. The document lays out the following vision for the year 2020:

*By the Year 2020, Malawi as a God-fearing nation will be secure, democratically mature, environmentally sustainable, self-reliant with equal opportunities for and active participation by all, having social services, vibrant cultural and religious values and being a technologically driven middle-income country.*⁵⁸

In order to achieve this overall vision, the policy lays out nine goals that need to come to fruition, each of which are addressed in detail. These are:

- Good governance;
- Sustainable economic growth and development;
- Vibrant culture;
- Economic infrastructure;
- Social sector development;
- Science and technology-led development;
- Fair and equitable distribution of income and wealth;
- Food Security; and
- Sustainable Nature Resource and Environmental Management.⁵⁹

⁵⁶ Government of Malawi, Ministry of Natural Resource, Energy and the Environment. (2010). Malawi State of Environment and Outlook Report: Environment for Sustainable Economic Growth. Retrieved June 1, 2017 from [http://www.undp.org/content/dam/malawi/docs/environment/Malawi State of the Environment and Outlook Report 2010.pdf](http://www.undp.org/content/dam/malawi/docs/environment/Malawi%20State%20of%20the%20Environment%20and%20Outlook%20Report%202010.pdf)

⁵⁷ Ibid

⁵⁸ Government of Malawi. (1998). Vision 2020: The National Long-term Development Perspective. Retrieved June 2, 2017 from http://www.africanchildinfo.net/cfr/policy_per_country/malawi/malawi_vision2020_en.pdf

⁵⁹ Ibid

After launching the Vision 2020, Malawi released a medium-term development strategy entitled the Malawi Growth and Development Strategy (MGDS) which covered the period between 2011 and 2016 and took measures to ultimately achieve the Vision 2020. The document cites its ultimate goal as being to tackle poverty by aiming to bolster the economy and develop infrastructure through socio-economic development. It ties in strongly with the MDGs in that it addresses all of them, providing targets and strategies in the following: poverty, hunger, education, gender, child mortality, maternal mortality, HIV and AIDS, Malaria, Environmental Sustainability, and Access to Water. The Strategy also ties into the Malawi Economic Growth Strategy (MEGS) and the Malawi Poverty Reduction Strategy (MPRS).⁶⁰

The MGDS II was launched following the completion of the MGDS period and ran from 2011-2016. Also a medium term strategy, it continues the quest towards achieving the Vision 2020. Following a nationwide consultative process, the document outlines six thematic areas, which are:

- 1) Sustainable Economic Growth;
- 2) Social Development;
- 3) Social Support and Disaster Risk Management;
- 4) Infrastructure Development;
- 5) Improved Governance; and
- 6) Cross-Cutting Issues.⁶¹

These thematic areas inform nine key priority areas (KPAs), which are:

- 1) Agriculture and Food Security;
- 2) Transport Infrastructure and Nsanje World Inland Port;
- 3) Energy, Industrial Development, Mining and Tourism;
- 4) Education, Science and Technology;
- 5) Public Health, Sanitation, Malaria and HIV and AIDS Management;
- 6) Integrated Rural Development;
- 7) Green Belt Irrigation and Water Development;
- 8) Child Development, Youth Development and Empowerment;
- 9) Climate Change, Natural Resources and Environmental Management.⁶²

Similar to the first MGDS, the KPAs within the MGDS II are intended to provide momentum for economic and social growth and development using Malawi's available resources.

A MDGS III is set to be launched in 2017, although reports indicate that the document is late in being presented – it being nearly two years after the expiry of MGDS III.⁶³

In addition to this, the *Malawi Country Strategy Paper 2013-2017* was introduced under the auspices of the African Development Bank (ADB). The Paper gives a comprehensive overview of the context within Malawi. From this context, the ADB provides two pillars that are to be addressed. The first of

⁶⁰ Government of Malawi. (2006). Malawi Growth and Development Strategy 2006-2011. Retrieved June 2, 2017 from [http://www.mtc.mw/attachments/article/360/Malawi Growth & Development Strategy August 2006.pdf](http://www.mtc.mw/attachments/article/360/Malawi%20Growth%20&%20Development%20Strategy%20August%202006.pdf)

⁶¹ Government of Malawi. (2011). Malawi Growth and Development Strategy II 2011-2016. Retrieved June 2, 2017 from <http://www.mw.one.un.org/wp-content/uploads/2014/04/Malawi-Growth-and-Dedvelopment-Strategy-MGDS-II.pdf>

⁶² Ibid

⁶³ The Times. (2017). My Expectations on MGDS III. Retrieved June 2, 2017 from <http://www.times.mw/my-expectations-on-mgds-iii/>

these is to attend to infrastructure bottlenecks that pose a threat to development and growth. The second pillar is to buttress initiatives that expand investment in the private sector and trade.⁶⁴

⁶⁴ African Development Bank. (2013). Malawi Country Strategy Paper. Retrieved June 8, 2017 from <https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/2013-2017 - Malawi - Country Strategy Paper.pdf>

2. Information and Communication Technology (ICT)

ICT has been recognised as one of the drivers behind development in Malawi. The Ministry of Information and Civic Education provides policy guidance on ICT within the government. This mandate includes overseeing areas that include the media, public access to information, broadcasting, telecommunication, postal services, civic education and information communication technology.⁶⁵

The ICT Association of Malawi (ICTAM) is a body that provides a connection between the private sector, academia, and government. It represents all ICT professionals in Malawi.⁶⁶

Malawi's ICT remains underdeveloped. The ICT Development Index (IDI) ranks Malawi at 168 out of 175 countries with an IDI value of 1.62. This is a very low score, considering that the Korean Republic's IDI is 8.84 – the highest country value. The rankings also place Malawi at number 32 in the 2015 regional rankings, behind South Africa and Botswana.⁶⁷

2.1 ICT Policy Frameworks

The Vision 2020 document contains a section on developing the use of Information Technology (IT) in Malawi. It notes that Malawi's use of IT is too low to meet the objective of development in all areas of Malawian society. As such, it outlines the following strategic options in order to achieve greater development. These are:

- *reviewing the Telecommunications Act to create an independent licensing body;*
- *improving investment opportunities in IT,*
- *removing monopolistic tendencies within IT industry;*
- *reducing tariffs on imported computers and parts to reduce costs;*
- *improving access to national and international information;*
- *introducing computers at early stages of education; and*
- *accorded duty-free importation of information technology equipment for use in private and public schools and colleges.*⁶⁸

The Malawi Digital Broadcasting Policy 2013-2018 aims to create an environment that supports the activities and aspirations of the digital broadcasting industry in Malawi. It seeks to do this by facilitating the development of an environment that adopts digital broadcasting over analogue broadcasting, aiming to provide universal broadcasting services for the public, and encourage efficient use of the broadcasting spectrum.⁶⁹

With regard to Malawi's development towards a knowledge society, the ICT development platform is grouped under the "Infrastructure Development" thematic area of the MGDS II, which has a

⁶⁵ Malawi Government. (2017). Ministry of Information and Civil Education. Retrieved June 5, 2017 from https://www.malawi.gov.mw/index.php?option=com_content&view=article&id=7&Itemid=27

⁶⁶ ICT Association of Malawi. (2017). Homepage. Retrieved June 8, 2017 from https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0ahUKewiX9smp767UAhVjBMAKHRDnBRYQFggnMAA&url=https%3A%2F%2Fwww.ictam.org.mw%2F&usq=AFQjCNGQCPJ7X9pU9t4aTDfrHRrZeE2Y6A&sig2=iBJWzLa_1wPIVgsTC42Q3Q

⁶⁷ ICT Development Index (IDI). (2016). Malawi. Retrieved June 5, 2017 from <http://www.itu.int/net4/ITU-D/idi/2016/index.html - idi2016countrycard-tab&MWI>

⁶⁸ Government of Malawi. (1998). Vision 2020: The National Long-term Development Perspective. Op cit

⁶⁹ Government of Malawi. (2013). The Malawi Digital Broadcasting Policy. Retrieved June 5, 2017 from <http://www.macra.org.mw/wp-content/uploads/2014/07/The-Malawi-Digital-Broadcasting-Policy.pdf>

subtheme for ICT with sections that include Information and Communication as well as Media and Communication.⁷⁰

The MGDS II also notes that a thriving ICT system is imperative for developing the country. With this in mind, it explains that the Government will support ICT strategies which include e-services, facilitating greater efficiency for the public, and improve access for citizens to public services. In order to do this, the policy outlines a plan to develop “a reliable, fast, adaptive and robust national ICT infrastructure that feeds into international networks; improving efficiency in delivering postal services; and developing public online services”.⁷¹

The policy states that its overall goal with regard to ICT in Malawi is to increase the use of ICT in the country, to promote universal access of the population to ICT products and services, and to improve upon service delivery in both the public and private sectors in this respect. Taking this goal into account, the policy hopes to achieve the following outcomes:

- *Improved ICT broadband infrastructure;*
- *Increased usage and access to information and communication services;*
- *Improved postal and broadcasting services;*
- *Improved ICT governance; and*
- *Enhanced ICT capacity for the general public.*⁷²

In order to achieve these outcomes, the document proposes several strategies, which include emphasizing ICT in sector policies and strategies and operations, increasing attention on rural areas by improving ICT access, and encouraging private ICT service providers to improve and extend their services.⁷³

In addition to these national policies which tackle development in general, Malawi has a National ICT Policy, which was released in 2013. The policy covers Information Technology, Telecommunications, Broadcasting, and Postal Services and aims to deliver ICT services to rural areas and vulnerable groups, invest in ICT priority areas, guide the public sector in laying out a plan to nationalize and use ICT to its full potential in the country, and to draw up a sound legal and regulatory framework in order to ensure the preservation of human rights, privacy for all citizens, the promotion of electronic services (e-services) as well as competition in the ICT sector.⁷⁴

The National ICT Policy is informed by preceding policies, which include the 1998 Communications Sector Policy, Digital Broadcasting Policy of 2013 and the Science and Technology Policy. It is also informed by the Vision 2020, the Malawi Growth and Development Strategy II, the Millennium Development Goals (Goal 8: Developing Global Partnerships) and the 1998 National Decentralization Policy.⁷⁵

The overall goal of the National ICT Policy is to facilitate socio-economic development by integrating ICT into all sectors providing ICT services in rural areas. The Policy outlines ten priority areas:

- 1) Strategic ICT Leadership;
- 2) Human Capital Development;
- 3) E-Government Services;
- 4) ICT in Industries;

⁷⁰ Government of Malawi. (2011). Malawi Growth and Development Strategy II 2011-2016. Op cit

⁷¹ Ibid

⁷² Ibid

⁷³ Ibid

⁷⁴ Government of Malawi. (2013). National ICT Policy. Retrieved June 5, 2017 from <http://www.macra.org.mw/wp-content/uploads/2014/07/Malawi-ICT-Policy-2013.pdf>

⁷⁵ Ibid

- 5) ICT Infrastructure Development;
- 6) ICT in the priority Growth Sectors;
- 7) Responsive ICT Legal, Regulatory and Institutional Framework;
- 8) National Security;
- 9) International Cooperation; and
- 10) Universal Access of ICT and ICT related services.⁷⁶

By focusing on the priority areas, the Policy intends to achieve the following outcomes:

- Improve access to basic health and educational services and improved ICT skills;
- Greater inclusion of citizens; increased access to government services and more transparency of government activities;
- An active ICT industry that enables the development of ICT products and services, while simultaneously energizing other industries in the country;
- Universal access to ICT Services;
- Creating more opportunities for income in Malawi;
- Delivering improved ICT services in a secure environment that is dependable and private;
- Providing world-class ICT products and service;
- Enhanced access to applicable information and public services.⁷⁷

Other legislation that has shaped the telecommunication environment in Malawi is the 2016 Telecommunications Act and the e-Transactions Act of 2016.

The National Access to Information Policy (2014) serves to promote access to information within Malawian society, recognizing it as an imperative in an increasingly globalizing world. It states that its overall policy goal is to contribute to making the public well informed with a view to being able to take part in the national development and governance of Malawi. The policy lists three objectives, namely:

1. *To facilitate provision of public information by Government and other institutions;*
2. *To ensure statutory and regulatory compliance of the relevant sections of the Constitution;*
3. *To provide a framework for developing the Access to Information Legislation.*⁷⁸

Cyber security has also been stressed as a priority, particularly because ICTs are more prominent than ever. The Electronic Transactions and Cyber Security Act No. 33 of 2016 aims to provide an extensive ICT legal framework to develop ICT, promote competition in the sector, and foster Malawi's participation in the knowledge society. The Act also makes data protection and privacy a priority and makes provision for the establishment of the Malawi Centre for Education Research and Training (CERT),⁷⁹ which is responsible for conducting research on behalf of the Ministry of Education, non-governmental organizations (NGOs) and other partners who are interested in researching different educational fields. The CERT also provides training programmes in research methodologies, report writing skills, cyber security, and data analysis to name a few.⁸⁰

Malawi also has an ICT for Development (ICT4D) Policy that was launched in 2006. The policy provides a framework that supports programmes development, implementation of these

⁷⁶ Ibid

⁷⁷ Ibid

⁷⁸ Government of Malawi. (2014). National Access to Information Policy. Retrieved June 5, 2017 from <http://www.macra.org.mw/wp-content/uploads/2014/07/National-Access-to-Information-Policy.pdf>

⁷⁹ Government of Malawi. (2016). The Electronic Transactions and Cyber Security Act No. 33. Retrieved June 5, 2017 from <http://www.macra.org.mw/wp-content/uploads/2014/07/E-Transactions-Act-2016.pdf>

⁸⁰ ELDIS. (2016). Centre for Education Research and Training (University of Malawi) (CERT). Retrieved June 5, 2017 from <http://www.eldis.org/go/home&id=40970&type=Organisation-.WTV-dMaB2Rs>

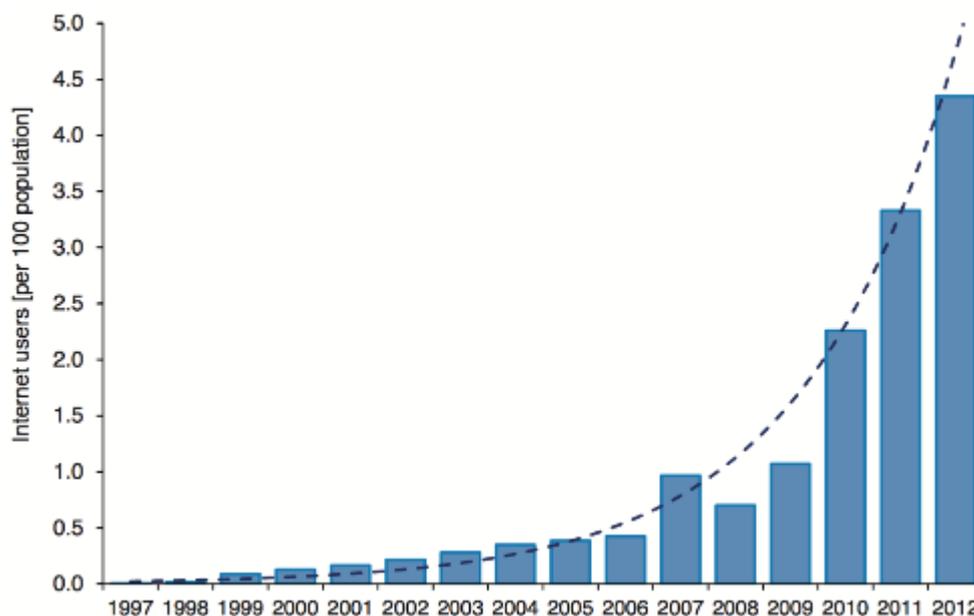
programmes as well as monitoring and evaluation. The Policy seeks to “consolidate an ICT approach for the mobilization, allocation and utilization of resources to realize institutional, community, sectoral and national development mandates within the short, medium and long-term framework in accordance with the Government of Malawi development policies and strategies”.⁸¹

2.2 ICT Infrastructure

Malawi’s total fixed line telephone subscriptions is 45,678, which means that, according to 2015 estimates, there is less than one subscription per 100 inhabitants in the country. This ranks Malawi at number 153 in the world. There are 6.116 million mobile phone users in the country with 34 subscriptions per 100 inhabitants (2015). This ranks Malawi at 117 in the world in this respect.⁸² However, the telecommunications sector in Malawi was estimated to have grown by 7.6% in 2013 and 11% in 2014. Despite the low adoption statistics, Malawi achieved the highest service uptake of internet services in Africa in the final quarter of 2013 at 48%. Services have mostly been dominated by narrowband voice and developments in broadband access are only becoming increasingly popular now, with greater demand for ADSL fixed lines, mobile 3G networks, and WiMax.⁸³

As of 2016, there have been five mobile phone operators in the country, namely, Telekom Networks Malawi (TNM) (partly owned by the Government), Airtel, Gmobile and Lacell, and G-Expresso.⁸⁴ The two fixed line service providers are Malawi Telecommunication Limited (MTL) as well as Access Communications Limited.

Figure 5 Internet Users in Malawi (per 100 people)⁸⁵



⁸¹ Government of Malawi. (2006). Malawi National ICT for Development Policy. Retrieved June 6, 2017 from <http://unpan1.un.org/intradoc/groups/public/documents/unpan/unpan033688.pdf>

⁸² CIA The World Factbook. (2017). Malawi. Op cit

⁸³ Malawi Telecommunications Limited. (2015). Fibre Optic Cable Back Bone: Special Purpose Vehicle Prospectus. Retrieved June 5, 2017 from <http://www.mtl.mw/uploads/FOC BACKBONE PROSPECTUS.pdf>

⁸⁴ Telcoma. (2016). List of Mobile Network Operators in Malawi. Retrieved June 5, 2017 from <http://www.telcomatraining.com/list-of-mobile-network-operators-of-malawi/>

⁸⁵ UNESCO. (2014) Mapping Research and Innovation in the Republic of Malawi. Retrieved June 8, 2017 from <http://unesdoc.unesco.org/images/0022/002288/228807E.pdf>

According to the National ICT Policy, as of 2012 there were just 2,112km of fibre optic cable that had been laid in the country and most of it was in urban areas.⁸⁶ There are 1.67 million internet users in the country, translating to 9.3% of the population according to 2016 estimates. Comparatively, this ranks Malawi at 135 internationally.⁸⁷ The potential growth of the ICT sector remains high as internet service providers are seeking inroads into the large untapped market in Malawi and mobile phone operators are expanding the sale of airtime, internet subscriptions and newer services including internet banking. As a result of the burgeoning possibilities, mobile phone companies continue to build infrastructure in the country to be able to support these services. There is quite a competitive market in Malawi, with 22 licensed Internet Service Providers (ISPs) in 2015, although limited availability of these services as well as the high costs in comparison to the GNI per capita have restrained growth of the industry.⁸⁸

During the implementation period for the first MGDS, accomplishments were made with regard to connecting fibre optic cable, which helped in the delivery of telecommunication services, improved mobile phone coverage, enhanced broadcasting services and postal and courier services, and automated some government services.⁸⁹

Malawi Telecommunications Limited (MTL) is a private company that offers a range of ICT services including fixed wireline and fixed wireless voice and data products and services to both residential and business customers.⁹⁰ Cognisant of the growing demand for broadband access, in 2015, MTL released a prospectus detailing plans to lay a countrywide fibre optic cable backbone. The network that MTL has planned meant that they called on other businesses to partner with them to form a special purpose vehicle (SPV) in which MTL and its partners would have a share.⁹¹ Subsequently, Open Connect Limited (OCL) was registered and incorporated as a 100% owned subsidiary to house Fibre Optic Cable infrastructure business assets in 2016 following business unbundling of MTL.⁹²

⁸⁶ Government of Malawi. (2013). National ICT Policy. Op cit

⁸⁷ CIA The World Factbook. (2017). Malawi. Op cit

⁸⁸ Malawi Telecommunications Limited. (2015). Fibre Optic Cable Back Bone: Special Purpose Vehicle Prospectus. Op cit

⁸⁹ Government of Malawi. (2011). Malawi Growth and Development Strategy II 2011-2016. Op cit

⁹⁰ Malawi Telecommunications Limited (MTL). (2017). About MTL. Retrieved June 5, 2017 from http://www.mtl.mw/index.php?page=corporate_profile&t=a

⁹¹ Malawi Telecommunications Limited. (2015). Fibre Optic Cable Back Bone: Special Purpose Vehicle Prospectus. Op cit

⁹² MyJobo. (2017). Open Connect Limited (OCL). Retrieved June 5, 2017 from [https://myjobo.com/company_detail?name=Open_Connect_Limited_\(OCL\)&cid=15494](https://myjobo.com/company_detail?name=Open_Connect_Limited_(OCL)&cid=15494)

Figure 6 Open Connect Limited Fibre Network⁹³

NG - SDH Backbone Network - IP based Backbone



The OCL fibre backbone is the only fibre network that links Malawi to East African Submarine Cable System (EASSy) through the northern link in Tanzania and Mozambique on the south eastern side, as well as the south western side of the country where they are cut off between Blantyre and Mzuzu.⁹⁴

Malawi Communications Regulatory Authority (MACRA) was established in line with the Communications Act of 1998.⁹⁵ It is responsible for regulating the telecommunications sector, taking over from the dissolved Malawi Post and Telecommunications Corporation (MPTC). MACRA oversees four major roles in the telecommunications sector: telecommunications, broadcasting, postal services, and radio services. It also acts as an advisory body to the MICE and supports research and development in the communications sector. The MACRA Strategic Plan 2015-2020 cites its goal as being to achieve universal access to ICT products and services by developing the ICT sector through effective regulation and research. Amongst its goals by 2020 are a Customer Satisfaction Index (CSI) of 75%, internet penetration of 25%, electronic commerce (e-commerce) penetration of 55%, and an 8% ICT contribution to GDP.⁹⁶

Other telecommunication infrastructure is the Regional Communications Infrastructure Programme (RCIP) which is intended to work past a bottleneck that Malawi experiences with regard to its access

⁹³ Open Connect. (2017). Network. Retrieved June 5, 2017 from <http://www.ocl.mw/index.php/ocl-network>

⁹⁴ Malawi Telecommunications Limited. (2015). Fibre Optic Cable Back Bone: Special Purpose Vehicle Prospectus. Op cit

⁹⁵ Government of Malawi. (1998). Communications Act, No. 41. Retrieved June 5, 2017 from <http://www.macra.org.mw/wp-content/uploads/2014/07/Communications-Act-19981.pdf>

⁹⁶ Malawi Communications Regulatory Authority (MACRA). (2015). Strategic Plan 2015-2020. Retrieved June 5, 2017 from <http://www.macra.org.mw/wp-content/uploads/2014/09/MACRA-Strategic-Plan-2015-2020.pdf>

to the coastal landing stations for submarine cables. Initiated in 2009, the project seeks to provide broadband services and access to fibre-optic cables from the city of Lilongwe to Dar es Salaam. The Malawian component of the project has three parts: the first is to create an enabling environment for the infrastructure to thrive, including capacity building. The second part is connectivity – to support connectivity through Public Private Partnerships (PPPs) and establishing a Virtual Landing Point (VLP). The third part of the project is project management, the most important component of this being financial support.⁹⁷

While these statistics and projects do indicate growth, they do not demonstrate sufficient achievements in the goals set out by the Malawi Country Strategy Paper. Specifically, they do not appear to tackle the pillar that aimed to attend to infrastructure bottlenecks that pose a threat to development and growth, as these bottlenecks appear to still exist.⁹⁸

2.3 ICT4D Initiatives

Realising the importance of keeping up with ICT innovation, the Malawian government established the e-Government Department. In line with this, the e-Government initiative has been undertaken with a view to achieving the aspirations set out in Vision 2020 by extending the use of ICT in Malawi and making provisions for socio-economic development. The e-Government initiative employs a strategy that seeks to:

- *Improve productivity, efficiency, effectiveness and service delivery through institutional and organizational reforms;*
- *Modernise the public service through the development and utilisation of ICT to support its operations and activities;*
- *Promote e-government through government to-government, government-to-business, and government-to-citizens initiatives;*
- *Promote the use of ICT to facilitate the decentralisation of government services and operations, and support the delivery of business and government services in rural areas;*
- *Improve the basic skills of public officers by ongoing training; and*
- *Develop and enforce standards and best practice to guide the delivery of services to the public.*⁹⁹

The Malawian government has received US\$135 million from the Chinese government to implement the e-Government initiative through the Department of e-Government. The project began in 2013 and is expected to take between four and five years. Key services that will be implemented include electronic services (e-services) such as e-immigration, an e-Learning platform that is due to be rolled out for the public sector, and an electronic document management system.¹⁰⁰

In 2017, Standard Bank Malawi donated 25 computers worth MWK5 million, which will be given to community technical schools that the government opened. The computers will be used to encourage ICT use in Malawian communities and upskill people so that they become more adept with using computers.¹⁰¹

⁹⁷ World Bank. (2009). Regional Communications Infrastructure Program Third Adaptable Program Loan Malawi Project. Retrieved June 6, 2017 from <http://documents.worldbank.org/curated/en/343281468000909914/pdf/T77180TAN0P111101Official0Use0Only1.pdf>

⁹⁸ African Development Bank. (2013). Malawi Country Strategy Paper. Op cit

⁹⁹ IST Africa. (2017). Current ICT Initiatives and Project – Malawi. Retrieved June 6, 2017 from <http://www.ist-africa.org/home/default.asp?page=doc-by-id&docid=6995>

¹⁰⁰ Ibid

¹⁰¹ Malawi24. (2017). Government Hails Standard Bank Malawi. Retrieved June 9, 2017 from <https://malawi24.com/2017/05/17/government-hails-standard-bank-malawi/>

Another worthwhile ICT4D initiative has been undertaken in the rural areas of Malawi. Funded by the International Telecommunications Union (ITU), MACRA Infrastructure Projects are embarking on a “Connect a Constituency” project which aims to provide ICT connectivity to people in rural areas – which is about 80% of the population. In 2011, MACRA began installing Multi-purpose Community Tele-centres in rural areas, which are supposed to provide ICT services. Plans are to extend these services to all districts in Malawi.¹⁰²

The benefits of electronic systems and services have also been used in the health sector. The e-Health project was launched by the Malawian Ministry of Health and Baobab Health Trust, an NGO in Malawi that endeavours to provide technology-based solutions for health in the country. Amongst other intentions, the project wants to do away with the paper-based system in favour of a digital one. This system will allow healthcare professionals to register patients’ data on a system which will provide better healthcare management and more efficient patient care. Other ventures within the project aim to create a 24-hour health hotline and to develop a booking system using SMS Technology for post-natal care. The College of Medicine in Malawi is researching the use of magnetic resonance imaging (MRI) within cases of malaria as a means of treating common neurological conditions and enhancing clinical treatment for patients at the College’s hospital. Scans are sent to Michigan State University for analysis.¹⁰³

The mobile service companies Airtel and TNM have introduced Mobile Money and mobile bill payments called Airtel Money¹⁰⁴ and Mpamba¹⁰⁵ respectively, which allow registered clients to bank electronically and pay bills. Some banks in Malawi have developed SMS notifications to alert customers when there has been a transaction on their account. This has helped in reducing incidences of fraud.¹⁰⁶

In 2014, Malawi also started an Internet Governance Forum following a consultative process that involved representatives from several sectors in the country including academia, private sector and the NEPAD Secretariat. The Malawi Internet Governance Forum (Mw-IGF) is intended to create a multi stakeholder initiative that will strive to optimally develop Malawi’s internet economy by building national capacity; encouraging dialogue between stakeholders; discuss and make suggestions on relevant issues affecting the sector; contribute to the drafting of national policy; and joining the discussion between different stakeholders about internet governance in the SADC region and Africa at large.¹⁰⁷

2.4 Key Actors and Players

Actor/Player	Role and Area of Development
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¹⁰² IST Africa. (2017). Current ICT Initiatives and Project – Malawi. Op cit

¹⁰³ Ibid

¹⁰⁴ Airtel. (2017). What is Airtel Money? Retrieved June 11, 2017 from <http://africa.airtel.com/wps/wcm/connect/AfricaRevamp/Malawi/home/personal/airtel-money/about-airtel-money>

¹⁰⁵ TNM Mpamba. (2017). What is Mpamba? Retrieved June 11, 2017 from <https://www.tnmpamba.co.mw/index.php/what-is-mpamba>

¹⁰⁶ IST Africa. (2017). Current ICT Initiatives and Project – Malawi. Op cit

¹⁰⁷ NEPAD. (2017). Malawi launches Internet Governance Forum. Retrieved June 11, 2017 from <http://www.nepad.org/content/malawi-launches-internet-governance-forum>

Actor/Player	Role and Area of Development
Malawi Communications Regulatory Authority (MACRA)	A parastatal that is responsible for regulating the telecommunications sector. MACRA oversees four major roles in the telecommunications sector: telecommunications, broadcasting, postal services, and radio services. It also acts as an advisory body to the MICE and supports research and development in the communications sector. ¹⁰⁸
Ministry of Information and Communication Engineering (MICE)	Provides policy guidance regarding “media, access to public information, broadcasting, telecommunication, postal services, civic education and information communication technology”. ¹⁰⁹
Telekom Networks Malawi (TNM)	A telecommunications company in Malawi partially owned by the government. Their network covers over 74% of Malawi and it provides high-speed broadband multimedia services as well as GSM/GPRS/EDGE networks. The company offers prepaid and postpaid voice and data services. ¹¹⁰
International Telecommunications Union (ITU)	Provides funding for the “Connect a Constituency” project, which aims to provide ICT connectivity to people in rural areas – which is about 80% of the population. In 2011, MACRA began installing Multi-purpose Community Tele-centres in rural areas, which are supposed to provide ICT services. Plans are to extend these services to all districts in Malawi. ¹¹¹
Airtel	Provides broadband, voice, text and banking solutions for individual customers and businesses. ¹¹²
Malawi Telecommunications Limited (MTL)	A private company that offers a range of ICT services including fixed wireline and fixed wireless voice and data products and services to both residential and business customers. ¹¹³
ICT Association of Malawi (ICTAM)	Provides a connection between the private sector, academia, and government. It represents all ICT professionals in Malawi. ¹¹⁴
Malawi Centre for Education Research and Training (CERT)	Is responsible for conducting research on behalf of the Ministry of Education, non-governmental organizations (NGOs) and other partners who are interested in researching different educational fields. ¹¹⁵
Chinese government	Gave a US\$135 million to implement the e-Government initiative through the Department of e-Government. ¹¹⁶

¹⁰⁸ Malawi Communications Regulatory Authority (MACRA). (2017). Organization. Retrieved June 6, 2016 from <http://www.macra.org.mw/organization/>

¹⁰⁹ Ministry of Information and Communication Engineering (MICE). (2017). About. Retrieved June 6, 2017 from https://www.malawi.gov.mw/index.php?option=com_content&view=article&id=7&Itemid=27

¹¹⁰ Telekom Networks Malawi (TNM). (2017). Company Profile. Retrieved June 6, 2017 from <https://www.tnm.co.mw/index.php/2013-04-19-09-03-21/none/company-profile.html>

¹¹¹ IST Africa. (2017). Current ICT Initiatives and Project – Malawi. Op cit

¹¹² Airtel. (2017). Homepage. Retrieved June 6, 2017 from <http://africa.airtel.com/wps/wcm/connect/africarevamp/Malawi/>

¹¹³ Malawi Telecommunications Limited (MTL). (2017). About MTL. Op cit

¹¹⁴ ICT Association of Malawi. (2017). Homepage. Op cit

¹¹⁵ Government of Malawi. (2016). The Electronic Transactions and Cyber Security Act No. 33. Op cit

¹¹⁶ IST Africa. (2017). Current ICT Initiatives and Project – Malawi. Op cit

2.5 Challenges in ICT Development

In 2016, the World Economic Forum (WEF) rated Malawi as one of the ten least developed countries in the world when it comes to technology, in spite of the government's efforts increase network uptime user satisfaction and widening the Government Wide Area Network (GWAN). The 2016 WEF Global Information Technology Report ranked Malawi 132 out of 139 countries, in the same category as Swaziland (129), Guinea (134), and Haiti (137). The report cites the main reason for Malawi's low ranking as being a lack of regulation, which has stunted growth of the industry. Malawi's score was also particularly low in ICT laws (134), mobile phone subscriptions, for which it scored 134 amongst other countries, and 137 for individual usage. Moreover, the 2016/17 capital budget expenditure estimates indicate that expenditure on the outdated GWAN is pulling funding from possible expenditure on e-services.¹¹⁷

Although Malawi has taken steps in the direction towards ICT development, the country still faces numerous challenges. According to the MGDS II, some of these challenges include low adoption rates of e-services, too few regulatory frameworks for the sector, high costs of communication which make ICT products and services inaccessible for a large portion of the population, little coordination on ICT infrastructure development, the sporadic availability of ICT services, scarce geographic coverage of these services, as well as too little institutional and human capacity in ICT services and low adoption rates of modern broadcasting technologies.¹¹⁸

The *Malawi ICT for Development Policy* also outlines several challenges that face the ICT sector in the country, adding that available resources are not used efficiently and that there is an over-dependence on donor-aid which poses a threat to the ICT sector if international funding sources dry up.¹¹⁹

¹¹⁷ The Nation. (2016). Malawi Among Bottom 10 in ICT- Report. Retrieved June 6, 2017 from <http://mwnation.com/malawi-among-bottom-10-in-ict-report/>

¹¹⁸ Government of Malawi. (2011). Malawi Growth and Development Strategy II 2011-2016. Op cit

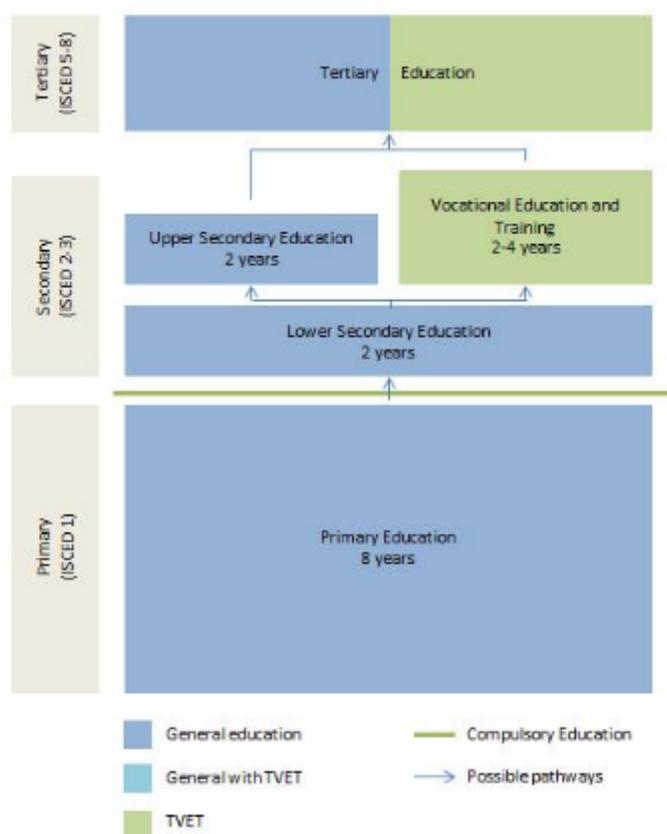
¹¹⁹ Government of Malawi. (2006). Malawi National ICT for Development Policy. Op cit

3 Education

The Ministry of Education, Science and Technology (MoEST) is responsible for education related matters in the country. Malawi’s education system is deeply affected by a context in which there is a high HIV and AIDS prevalence, a significant number of youth are living in rural areas, and a need for concerted socio-economic development. The country’s education system is divided into an 8-4-4 system: primary, secondary, and tertiary school. The first eight years of schooling are compulsory and most children start primary school at the age of six.¹²⁰

Some, however, between the ages of zero and five attend pre-primary school at day-care centres or pre-school groups, although this is not mandatory. In 2004, a revised *Early Childhood Development Policy (ECD): Development and Implementation in Africa* was launched by UNESCO, which focused on a holistic view of ECD including malnutrition, social issues and HIV and AIDS.¹²¹

Figure 7 Malawi’s Education System¹²²



The Free Primary Education Policy (FPE) was introduced in 1994, aiming to provide FPE to all citizens. The number of primary schools in Malawi saw a slight increase of 2% from 5,738 in 2015 to 5,864 in 2016. Between 2012 and 2015, the number of permanent classrooms in primary schools increased, although there was a significant decrease of 1.7% between 2015 (38,241) and 2016 (37,601). The

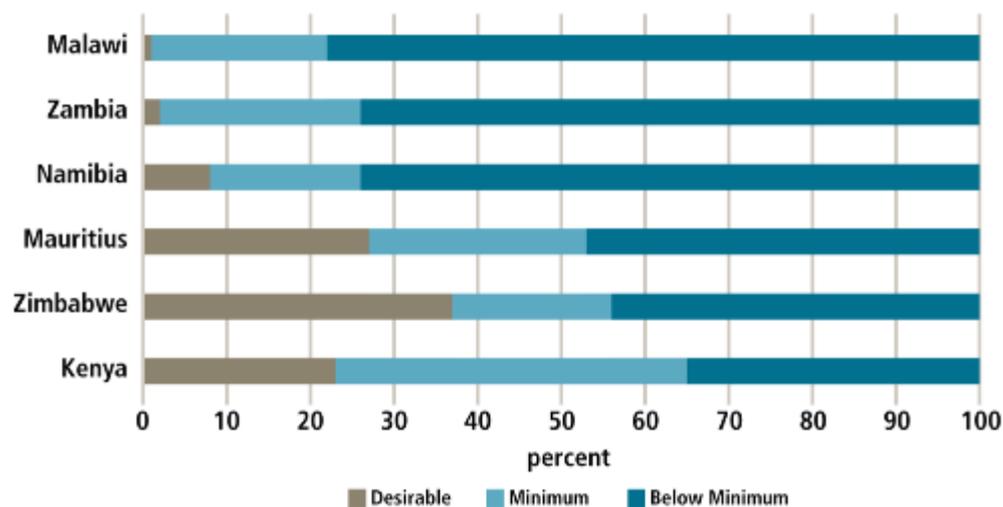
¹²⁰ Isaacs, S. (2007). ICT for Education in Malawi. Retrieved June 6, 2017 from http://www.infodev.org/infodev-files/resource/InfodevDocuments_414.pdf

¹²¹ UNESCO. (2004). ECD Policy Development and Implementation in Africa. Retrieved June 7, 2017 from <http://unesdoc.unesco.org/images/0013/001375/137564e.pdf>

¹²² UNESCO & International Centre for Technical and Vocational Education and Training. (2017). World TVET Database Country Profile: Malawi. Retrieved June 7, 2017 from <http://www.unevoc.unesco.org/go.php?q=World+TVET+Database&ct=MWI>

Gross Enrollment Rate (GER) for primary schools is 131%, with a target of 117.5% by the end of 2017. The Net Enrollment Rate (NER) measures the proportion of students who are enrolled with reference to the official school age group. The NER for 2016 was 97.9%.¹²³

Figure 8 Percentage of Grade Six students reaching reading proficiency levels¹²⁴



Secondary education takes four years to complete – there are two cycles lasting two years each (Form 1 to Form 4). The number of public and private secondary schools increased steadily between 2012 where there were a total of 1,015 secondary schools, and 2016, where there were 1,513. There has been a marked improvement in the number of students enrolled in secondary schools, which has increased from 260,064 in 2012 to 351,651 in 2016. The national GER for secondary schools in 2016 was 23%, while the NER was 15% for the same year. Despite these promising statistics, FPE put a lot of pressure on the secondary schooling system.¹²⁵ As a result, the quality of education that students are receiving is subpar.¹²⁶

The number of secondary school drop-outs increased between 2014/15 (14,940) and 2015/15 (17,288). Across all forms, a greater number of girls dropped out of school, with a larger number of both boys and girls dropping out in junior secondary school. The reasons for high incidences of drop-outs vary from a lack of teachers to students having to begin working in order to support the family, pregnancy, and even a lack of facilities – particularly for girls. Other reasons include a lack of support for students, early marriage, little interest in school, having to travel long distances to get to school, the expense of having to pay for secondary school, sickness, and violence.¹²⁷

There are four public universities in Malawi, namely: Lilongwe University of Agriculture and Natural Resources, Malawi University of Science and Technology, Mzuzu University, and University of Malawi. However, because public institutions would not be able to handle the demand for tertiary education, the Malawian government promoted the establishment of the private sector in higher education, giving rise to another 20 private institutions. Overall, registered higher education institutions are:

¹²³ Ministry of Education, Science and Technology. (2015). The 2015/16 Education Sector Performance Report. Retrieved June 6, 2017 from http://csecmw.org/2015_16-EDUCATION-SECTOR-PERFORMANCE_REPORT.pdf

¹²⁴ Centre for Global Development. (2013). Schooling Is Not Education! Using Assessment to Change the Politics of Non-Learning. Retrieved June 7, 2017 from https://www.cgdev.org/doc/full_text/CGDReports/3120290/schooling-is-not-education.html

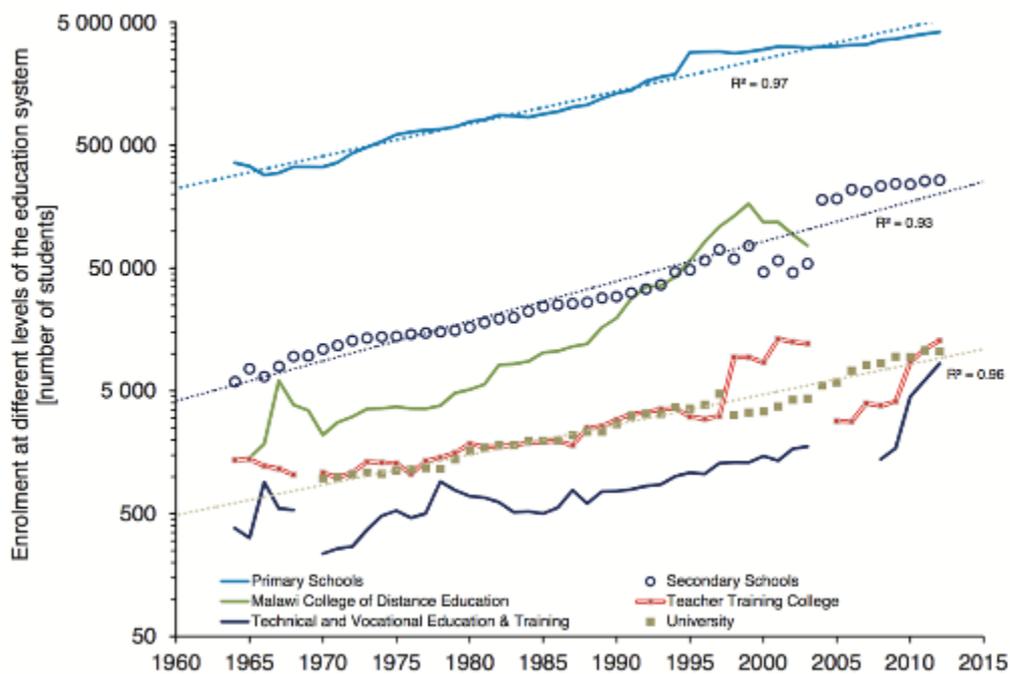
¹²⁵ Ministry of Education, Science and Technology. (2015). The 2015/16 Education Sector Performance Report. Op cit

¹²⁶ Danish Trade Union, Council for International Development Corporation. (2016). Labour Market Profile: Malawi. Op cit

¹²⁷ Ministry of Education, Science and Technology. (2015). The 2015/16 Education Sector Performance Report. Op cit

- 1) University of Malawi (and its constituent colleges)
- 2) Mzuzu University
- 3) Lilongwe University of Agriculture and Natural Resources
- 4) Malawi University of Science and Technology
- 5) Malawi College of Accountancy (MCA)
- 6) Blantyre International University (BIU)
- 7) African University of Guidance and Counseling (AUGCS)
- 8) Pentecostal Life University
- 9) Daughters of Mary Immaculate (DMI), St. John the Baptist University –
- 10) Mangochi and Lilongwe Campuses
- 11) Nkhoma University
- 12) Daeyang University
- 13) Shareworld Open University
- 14) Malawi Adventist University
- 15) University of Livingstonia
- 16) African Bible College
- 17) Malawi Assemblies of God University 17.
- 18) Skyway University
- 19) Columbia University
- 20) Lake Malawi Anglican University
- 21) Exploits University
- 22) Unicaf University
- 23) Millennium University
- 24) Riverton University
- 25) Malawi Institute of Management.¹²⁸

Figure 9 Enrolment in Different Levels of School in Malawi¹²⁹



¹²⁸ Ibid

¹²⁹ UNESCO. (2014) Mapping Research and Innovation in the Republic of Malawi. Op cit

In addition to higher education is the Technical, Entrepreneurial, and Vocational Education and Training (TEVET) stream, which has several programmes which include Apprenticeships, Public and Private Sector Training, Informal Sector Training, Quality Assurance, and Competence-Based Education and Training (CBET). TEVET is overseen by the Technical, Entrepreneurial and Vocational Education and Training Authority of Malawi (TEVETA). Established in 1999, TEVETA provides policy guidance and governance for TEVET.¹³⁰

Tertiary enrolment in Malawi remains low and vocational training covers a limited scope. Most students opt for informal apprenticeships. This means that an estimated 83% of Malawian youth are having to face a qualifications incongruity when they enter the labour market.¹³¹

The National Council for Higher Education (NCHE) was established in 2011 and is responsible for the provision of accreditation and quality assurance services for the higher education sector in Malawi. It creates and maintains standards for teaching, examinations and qualifications, as well as having the power to register and de-register higher education institutions and create a framework for funding of those institutions.¹³² In terms of budgeting, Basic Education received 56% of the education budget for the 2015/16 fiscal year, while secondary education received 18% and higher education received 24%.¹³³ Government expenditure on education was 5.61% of GDP in 2015¹³⁴ – this is low in comparison to Namibia for example, which spent 8.3% of GDP on education (2015).¹³⁵

Malawi joined the Global Partnership for Education in 2009 based on its National Education Sector Plan (NESP) 2008-2017. The Plan outlines three thematic areas that it wants to address during the ten-year implementation period. These are:

- To extend access to equitable education so that all people can benefit from it;
- To enhance both the quality and the relevance of education in order to reduce rates of drop-out and repetition and within this, to ensure that learning is effective; and
- To advance better management and governance of Malawi's education system in order to make sure that service delivery is more effective and efficient.¹³⁶

In order to make progress in these thematic areas, cooperation is required between the Ministry of Women and Child Development, the Ministry of Youth Development and the Ministry of Sports and Education, Science and Technology, as well as statutory bodies such as the Malawi Institute of Education, the Malawi Library Services, the Malawi National Examinations Board and the Universities within Malawi. The Strategic Plan also calls for cooperation between private organizations in education.¹³⁷

Implementation of the NESP was undertaken by two implementation plans, the most recent of which is the Education Sector Implementation Plan II (ESIP II), which charts out the objectives and means of implementation for the sector plan similar to its antecedent, ESIP I.

¹³⁰ Technical, Entrepreneurial and Vocational Education and Training Authority of Malawi (TEVETA). (2017). About us. Retrieved June 7, 2017 from <http://www.teveta.mw/index.php/about-us>

¹³¹ Danish Trade Union, Council for International Development Corporation. (2016). Labour Market Profile: Malawi. Op cit

¹³² The National Council for Higher Education (NCHE). (2017). Homepage. Retrieved June 6, 2017 from <http://www.nche.ac.mw/index.php/joomla-pages-iii/blog-layout/21-responsive/24-free-responsive-joomla-2-5-template>

¹³³ Ministry of Education, Science and Technology. (2015). The 2015/16 Education Sector Performance Report. Op cit

¹³⁴ Trading Economics. (2017). Malawi - Public spending on education, total (% of GDP). Retrieved June 8, 2017 from <https://tradingeconomics.com/malawi/public-spending-on-education-total-percent-of-gdp-wb-data.html>

¹³⁵ CIA The World Factbook. (2017). Namibia. Retrieved June 6, 2017, from <https://www.cia.gov/library/publications/the-world-factbook/geos/wa.html>

¹³⁶ Ministry of Education, Science and Technology. (2008). National Education Sector Plan (NESP) 2008-2017. Retrieved June 6, 2017 from <http://www.globalpartnership.org/content/malawi-education-sector-plan>

¹³⁷ Ministry of Education, Science and Technology. (2008). National Education Sector Plan (NESP) 2008-2017. Retrieved June 6, 2017 from <http://www.globalpartnership.org/content/malawi-education-sector-plan>

Malawi introduced a New Language of Instruction (LOI) Policy, which states that English is to be the language of instruction from the first year of primary school (Standard 1). The Policy has been deemed problematic because for most of the country, English is not their first language. Many children have little experience of speaking or hearing the language before school, but as soon as they start primary school, they are expected to be taught, to read, and to write in English. In addition to this, teachers are often not equipped to speak or teach in English, making educating very difficult.¹³⁸

3.1 ICT in Education

Although ICT has been highlighted as a national priority, this has not fully suffused the schooling system. In 2005, Computer Sciences was introduced as a subject in some schools. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) published a paper in 2015 entitled *Information and Communication Technology (ICT) in Education in Sub-Saharan Africa*. Statistics for 2007 indicate that Malawi had the fewest ICT in primary schools in Sub-Saharan Africa. The country had radios in 14% of primary schools, televisions in 1%, and Computers in 2%. This compares to the Seychelles which had the largest number of ICTs in primary schools with radios and computers in all primary schools and televisions in 93% of primary schools. The UNESCO report found that in 2013, electricity was rare in many Malawian schools – only 15% of primary schools and 54% of lower secondary schools had electricity.¹³⁹ These conditions speak to a fundamental problem within the education system, where ICT in education cannot develop without the basic enablers that allow it to proliferate.

The overall policy outcomes for Malawi's National ICT Policy include mention of increasing educational facilities and increasing ICT skills. It also states that enhancing ICT service delivery in education will aid human capital development. In order to do this, the Policy explains that Government will seek to provide ICT facilities to educational facilities at all levels, both to make management of the education system more effective, and to bolster people's access to and quality of education.¹⁴⁰

There are educational and e-Learning projects in Malawi, some of which are as a result of the National ICT Policy. Computers for Malawian Schools (CFMS) is an NGO that operates out of Blantyre and under the banner of Computers for African Schools (CFAS). CFMS provides computers for Malawian schools and it also assists with creating computer laboratories.¹⁴¹ The scheme is administered by both the British Council and SchoolNet Malawi. ICTs are delivered to Lilongwe, duty-free, and are then given over to SchoolNet, which, after repairing and packaging them, delivers them to recipient schools.¹⁴²

Computers 4 Africa is another initiative that has provided thousands of computers to African countries including South Africa, the Gambia, and Malawi. The organization works closely with local

¹³⁸ Kamwendo, G.H. (2016). The New Language of Instruction Policy in Malawi: A House Standing on a Shaky Foundation. Retrieved June 7, 2017 from <https://link.springer.com/article/10.1007/s11159-016-9557-6>

¹³⁹ United Nations Educational, Scientific, and Cultural Organisation. (2015). *Information and Communication Technology (ICT) in Education in Sub-Saharan Africa*. Retrieved June 7, 2017 from <http://uis.unesco.org/sites/default/files/documents/information-and-communication-technology-ict-in-education-in-sub-saharan-africa-2015-en.pdf>

¹⁴⁰ Government of Malawi. (2013). National ICT Policy. Op cit

¹⁴¹ IT Schools Africa. (2017). Malawi. Retrieved June 7, 2017 from <http://www.itschoolsafrica.org/malawi.html>

¹⁴² Connect a School. (2017). Computers for African Schools (CFAS) project in Malawi. Retrieved June 7, 2017 from <http://connectaschool.org/node/978>

NGOs and aims to reduce the cost of ICTs in the countries in which they operate. They refurbish computers and send them to African countries at a greatly reduced price.¹⁴³

In addition, the Pan African e-Network Project is a large initiative involving India and African countries to connect all 53 African nations by satellite and fibre optic cabling. This would encourage communication between countries for a host of activities including tele-education, tele-medicine, Internet, e-Government, e-Commerce, and meteorological services. The tele-education branch of the project is an e-Learning initiative that allows five African Universities, including the University of Malawi to be connected to a hub through a 2mbbs broadband/VSAT. This, in turn, connects them to 53 virtual classrooms in as many countries. Moreover, five Indian universities are connected to the African Hub and India hosts a tele-education portal which includes a knowledge management system (KMS), e-Learning and library management.¹⁴⁴

The Unlocking Talent Project provides Digital Education Technology (DET) to primary school children, with a special focus on marginalized groups. The programme gives children a knowledge base in the early years of education, which they can deepen in later primary and secondary school.¹⁴⁵

The Malawian Government is also launching a Skills Development Project in The Polytechnic, Chancellor College, Lilongwe University of Agriculture and Natural Resources, TEVETA, and Mzuzu University. One element of the project is to develop a Higher Education Management Information System (HEMIS) for the NCHE which will enhance access to data on higher education in the country from a central system.¹⁴⁶

3.2 Curriculum

The MoEST is tasked with handling the national curriculum for public primary and secondary schools.¹⁴⁷ As mentioned above, the NCHE is responsible for quality assurance and regulation of the tertiary education system and MANEB is mandated with conducting examinations following an approved course, as well as providing certificates or diplomas to successful candidates.¹⁴⁸

In September 2015, the MoEST began implementation of a new curriculum for secondary schools. The curriculum means that chemistry and physics are to be taught in all of the 24 national secondary schools, 43 District Boarding Schools, and 48 District Day Secondary Schools amongst other secondary school institutions who will be provided with science kits.¹⁴⁹

Computer Studies was introduced as an optional examinable subject in the secondary school curriculum in 2005. The decision to implement the subject was informed by the idea that computer literacy was becoming a crucial part of professional and day-to-day life. It was also implemented

¹⁴³ Computers 4 Africa. (2017). Apply to Receive IT Equipment. Retrieved June 7, 2017 from <https://www.computers4africa.org.uk/get/index.php>

¹⁴⁴ Pan-African e-Network Project. (2017). Tele-Education. Retrieved June 7, 2017 from <http://www.panafricanenetwork.com/Portal/ProjectDetails.jsp?projectidhide=9&projectnamehide=Tele Education>

¹⁴⁵ The Unlocking Talent Project. (2017). About. Retrieved June 7, 2017 from <https://unlockingtalent.org/about>

¹⁴⁶ Ministry of Education, Science and Technology. (2015). The 2015/16 Education Sector Performance Report. Op cit

¹⁴⁷ Ministry of Education, Science and Technology. (2017). Homepage. Retrieved June 6, 2017 from https://www.malawi.gov.mw/index.php?option=com_content&view=article&id=21&Itemid=21

¹⁴⁸ The Malawi National Examinations Board (MANEB). Vision, Mission, Mandate & Core Values. Retrieved June 7, 2017 from http://www.maneb.edu.mw/index.php?option=com_content&view=article&id=89&Itemid=473

¹⁴⁹ AllAfrica. (2015). Malawian Secondary Schools Now On New Curriculum. Retrieved June 8, 2017 from <http://allafrica.com/stories/201509141021.html>

with the future in mind – the idea that Malawian students will be adept in ICT skills and could therefore contribute economically to their communities and country at large.¹⁵⁰

3.3 Professional Development

According to the Education Sector Performance Report, the number of qualified teachers in Malawi has been increasing steadily from 2013, where there were 59,178 qualified primary teachers to 2016, where there were 61,628.¹⁵¹ There have also been efforts to train new teachers in the past few years, with 10,000 new teachers being trained, although recruitment has been pushed back.¹⁵²

A *Teach the Teachers* community initiative was undertaken at the beginning of 2016, which seeks to impart basic computer skills on Malawi’s teachers so that they know how to use a computer and how to access the internet in order to improve their teaching and make it more effective. This is particularly useful in rural areas, where teaching materials are often hard to come by. The initiative therefore helps teachers to find other means of accessing teaching materials on the internet.¹⁵³

Realising the need for professional development, particularly in the rural areas of Malawi where it is common to have about 200 students in a classroom, the Basic Education Programme was launched in 2014. The four-year programme was commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) in partnership with the MoEST. The programme tries to ensure that the teaching environment becomes more manageable and conducive to learning by encouraging the MoEST to disperse teachers evenly between districts and schools. Secondly, development workers are providing information and advice on how teacher training can be improved at all institutions by modifying the curriculum for the two basic teacher training courses. The curriculum for the courses will be focused on providing education for different groups of students, and teachers will be provided with improved studying and learning materials. Thirdly, the programme is assisting MoEST’s Department of Special Education in creating an ICT-based certificate course that will train teachers on how to educate students that they might have with learning problems.¹⁵⁴

3.4 Key Actors and Players

Actor/Player	Role and Area of Development
Ministry of Education, Science and Technology (MoEST)	Oversees Malawi’s education sector, provides policy guidance. ¹⁵⁵
National Council for Higher Education (NCHE)	Creates and maintains standards for teaching, examinations and qualifications, as well as having the power to register and de-register higher education institutions and creating a framework for funding of those institutions. Responsible for quality assurance. ¹⁵⁶

¹⁵⁰ Malaptop. (2013). Guest Blog: Computer Education in Malawian Secondary Schools. Retrieved June 8, 2017 from <http://malaptop.org/guest-blog-computer-education-in-malawian-secondary-schools/>

¹⁵¹ Ministry of Education, Science and Technology. (2015). The 2015/16 Education Sector Performance Report. Op cit

¹⁵² Danish Trade Union, Council for International Development Corporation. (2016). Labour Market Profile: Malawi. Op cit

¹⁵³ Naturally Africa Volunteers. (2016). Computer Education in Malawi – Teach the Teachers. Retrieved June 7, 2017 from <https://www.volunteerafrica.com/computer-education-malawi-teach-teachers/>

¹⁵⁴ German Federal Ministry for Economic Cooperation and Development (BMZ). (2017). Improving Basic Education. Retrieved June 7, 2017 from <https://www.giz.de/en/worldwide/20110.html>

¹⁵⁵ Ministry of Education, Science and Technology. (2017). Homepage. Op cit

¹⁵⁶ The National Council for Higher Education (NCHE). (2017). Homepage. Op cit

Actor/Player	Role and Area of Development
Technical, Entrepreneurial, and Vocational Education and Training (TEVETA)	Established in 1999, TEVETA provides policy guidance and governance for TEVET. ¹⁵⁷
Malawi National Examinations Board (MANEB)	Mandated with conducting examinations following an approved course, as well as providing certificates or diplomas to successful candidates. ¹⁵⁸
SchoolNet	Provides computers for Malawi's schools. ¹⁵⁹
Computers for Malawian Schools (CFMS)	An NGO that operates out of Blantyre and under the banner of Computers for African Schools (CFAS). CFMS provides computers for Malawian schools and it also assists with creating computer laboratories. ¹⁶⁰
German Federal Ministry for Economic Cooperation and Development (BMZ)	Began the Basic Education Programme 2014-2018. Amongst other objectives, the programme is assisting MoEST's Department of Special Education in creating an ICT-based certificate course that will train teachers on how to educate students that they might have with learning problems. ¹⁶¹

3.5 Challenges facing the education sector

There are numerous challenges that are facing the education sector which, in turn, make development of a knowledge society in Malawi difficult. Firstly, the ICT for Development Policy points out that low levels of literacy mean that ICT programmes are difficult to implement, which is particularly true for women, youth and disadvantaged groups in the country.¹⁶²

There are also serious day-to-day difficulties that students face which makes it hard for them to receive an education. This includes insufficient schooling facilities, high dropout rates, and a low completion rate. There are very imbalanced student to teacher ratios, particularly in rural areas. Moreover, because of the high prevalence of HIV and AIDS, learning achievement is particularly difficult for students in rural areas who sometimes lose one or both parents to the disease or are afflicted with the disease themselves.¹⁶³

Young women in Malawi are also faced with constraints to their education, many of them are forced to marry very young or do not have access to contraception, which means that they get pregnant early on in their lives. In Malawi, a pregnant girl cannot go to school, nor can she return to school once she has had the baby unless she can find a relative to take care of the child. This means that a large proportion of girls are not able to finish school, posing a threat to the development of the knowledge society.¹⁶⁴

¹⁵⁷ Technical, Entrepreneurial and Vocational Education and Training Authority of Malawi (TEVETA). (2017). Op cit

¹⁵⁸ The Malawi National Examinations Board (MANEB). Vision, Mission, Mandate & Core Values. Op cit

¹⁵⁹ Into Portfolio. (2017). Schoolnet Malawi. Retrieved June 7, 2017 from <http://www.intoportfolio.com/School Net Malawi - Blantyre.html>

¹⁶⁰ IT Schools Africa. (2017). Malawi. Op cit

¹⁶¹ German Federal Ministry for Economic Cooperation and Development (BMZ). (2017). Improving Basic Education. Op cit

¹⁶² Government of Malawi. (2006). Malawi National ICT for Development Policy. Op cit

¹⁶³ Global Partnership for Education. (2017). Malawi. Retrieved June 7, 2017 from <http://www.globalpartnership.org/country/malawi>

¹⁶⁴ The Guardian. (2012). The Threat to Finish School in Malawi. Retrieved June 7, 2017 from <https://www.theguardian.com/education/2012/mar/12/education-school-malawi-girls-millennium>

4 Science, Technology, and Innovation (STI)

The Government of Malawi acknowledges the importance of advocating for Science, Technology, and Innovation (STI) in the country, particularly because of STIs' possible contribution to the knowledge society. This is evidenced in the Vision 2020 document, which makes specific reference to fostering science and technology-led development. The Policy notes six strategic challenges with regard to STI development:

- 1) *how to improve Science and Technology (S&T) education, training and culture;*
- 2) *how to promote Science and Technology research and development including commercialization;*
- 3) *how to adapt and promote transfer of new and emerging technologies;*
- 4) *how to promote environmentally-sound technologies;*
- 5) *how to achieve effective Science and Technology; and*
- 6) *how to promote implementation and use of information technology.*¹⁶⁵

The MoEST is tasked with promoting STI in Malawi on behalf of the government. Within the Ministry is a Department of Science and Technology which uses STI to attain socio-economic development for Malawi.¹⁶⁶ Additionally, the National Commission for Science and Technology (NCST) advises government and relevant stakeholders on matters relating to science and technology in order to promote STI development in Malawi. Amongst other important functions, the organization creates awareness of STI; conducts research; supports government, the private sector, and policy-makers to create and amend policies, legislation, strategies and legislation in favour of STI; and maps out the national direction for ST in Malawi.¹⁶⁷

4.1 STI Policies and Objectives

The MGDS II states its goal with regard to STI is to develop the socio-economic climate by applying and promoting science and technology as a means of supporting industrial productivity as well as the quality of the country's goods and services. Science and technology are highlighted as being a valuable element to dealing with issues such as poverty reduction, the HIV and AIDS epidemic, and the need for better infrastructure in Malawi.¹⁶⁸

Malawi adopted their first science and technology policy in 1991, although the plan did not incorporate STI into national planning.¹⁶⁹ The *Revised National Science and Technology Policy*, published in 2002, has also played a large role in guiding the direction that the country has taken with regard to STI. Its implementation was undergirded by the Science and Technology Act of 2003 and it set out a more explicit direction for R&D, policy formation for STI, and strategies and legal frameworks therein.

A report titled *The State of Science and Technology in Malawi 2010-2011* gives a comprehensive picture of STI development in the country including the policy, regulatory environment, research, and governance. It outlines positive achievements that have been made in STI with regard to

¹⁶⁵ Government of Malawi. (1998). Vision 2020: The National Long-term Development Perspective. Op cit

¹⁶⁶ Ministry of Education, Science and Technology. (2017). Homepage. Op cit

¹⁶⁷ National Commission for Science and Technology (NCST). (2017). Functions of the Commission. Retrieved June 7, 2017 from http://www.ncst.mw/?page_id=259

¹⁶⁸ Government of Malawi. (2011). Malawi Growth and Development Strategy II 2011-2016. Op cit

¹⁶⁹ Science, Technology and Innovation Cooperation Between Sub-Saharan Africa and Europe. (2013). Malawi. Retrieved June 7, 2017 from https://caast-net-plus.org/policy_context/sti_systems_africa/malawi

different sectors including education and training, intellectual property, ICT, agriculture, and energy.¹⁷⁰

4.2 Research and Innovation

Malawi's GERD expenditure on R&D in the fiscal year 2007/08 was MWK7,164.5. The majority of this was in higher education, from which MWK2,299.3 million came, followed by private NGOs, which spent MWK1,844.3.¹⁷¹ The government of Malawi has been conducting regular Research and Development (R&D) surveys since 2010. Malawi's Gross Domestic Expenditure on Research and Development was 1.06% of their GDP in 2010. This ranked them as the highest spending SADC country, ahead of South Africa which had a GERD of 0.73 as a percentage of GDP, and Mozambique's GERD of 0.42%.¹⁷²

The figures above give an indication of the gross expenditure on R&D in the 2007/08 fiscal year. Malawi's expenditure increased to MWK8,596.5 million in 2010, although as a proportion of GDP, the GERD was lower at 1.06%. Despite appearances that this is a significant investment in R&D because Malawi is one of very few countries in Africa to contribute 1% or more of its GDP to R&D, it must be taken into account that the country has a significantly smaller economy than other African countries. Hence, in real terms, R&D investment in Malawi is rather low – in a conversion to Purchasing Power Parity (PPP), Malawi's R&D expenditure is PPP US\$137.2 million (2007) and PPP US\$ 115 million (2010). Hence, there is an indication here that the desire to expand investment in the private sector and trade set out in the Malawi Country Strategy Paper 2013-2017 is not being implemented as strongly as some might desire.

However, Malawi's research output is, in many cases, greater than scientists in other African countries who have greater resources at their disposal. For example, the country published a total of 317 scientific articles in 2010 in comparison to Burkina Faso's 309 and Niger's 135. When reviewing the ration of GDP contribution to R&D and output, it becomes evident that Malawi's output was 1.5 times greater than that of the Netherlands and 3.5 times more productive than Burkina Faso in 2010.¹⁷³

The NCST has numerous projects and programmes. Some of these include:

- Women in Science and Technology Network (WISTNET): Launched in 2009, the network consists of Malawian women scientists, researchers and technologists. It promotes STI amongst women and girls in Malawi at both the national and international levels through capacity building, networking, and research. Advocates for the role of women researchers, scientists and technologists to play larger decision-making roles.
- Climate Change National Designated Entity (NDE): NCST was nominated by the United Nations Framework Convention on Climate Change as the NDE on Climate Change. The established NDE will be a central point of contact for activities regarding climate change and technology development that might help in this respect.
- Programme for Biosafety Systems (PBS): Encourages the use of PBS in Malawi as a means of overcoming poverty, hunger and disease. NCST has helped to developed a legal policy, a

¹⁷⁰ National Commission for Research, Science and Technology. (2011). The State of Science and Technology in Malawi 2010-2011. Retrieved June 8, 2017 from http://www.ncst.mw/?page_id=163

¹⁷¹ Science, Technology and Innovation Cooperation Between Sub-Saharan Africa and Europe. (2013). Malawi. Op cit

¹⁷² UNESCO. (2015). Science Report: Toward 2030. Retrieved June 7, 2017 from https://books.google.co.za/books?id=SDHwCgAAQBAJ&pg=PA541&lpg=PA541&dq=World+bank+STI+Malawi&source=bl&ots=AlRONwgjlf&sig=aLW4xv4ffFQ7Ui9u2jYyRjU4PA&hl=en&sa=X&redir_esc=y - v=onepage&q=World bank STI Malawi&f=false

¹⁷³ UNESCO. (2014) Mapping Research and Innovation in the Republic of Malawi. Op cit

Genetically Modified Seed Import Procedure Manual, and the Malawi Guidelines on Biotechnology amongst other helpful measures.¹⁷⁴

In addition to the positive work that the NCST is doing, the International Research Development Centre (IRDC) focuses on supporting farming systems including food security in Malawi and HIV and AIDS. It has pursued 69 activities in Malawi since 1978, worth an estimated CA\$16.2 million. Some of its activities have included tackling climate change, maternal health such as neonatal care, HIV and AIDS and tuberculosis as well as food security in the region.¹⁷⁵

4.3 Human Resource Development

With regard to human resource development in Malawi, the figure below illustrates the headcount for R&D personnel in the country. It is evident that whilst the number of personnel have increased between 1967 and 2010, although not by a significant margin.

Figure 10 R&D personnel in Malawi by occupation, head count, 1967, 1977, 2007 and 2010¹⁷⁶

R&D personnel by occupation [Head counts]	1967	1977					2007					2010				
	Total	Total	Business	Government	Higher education	Private non-profit	Total	Business	Government	Higher education	Private non-profit	Total	Business	Government	Higher education	Private non-profit
Total	1243	2073	786	928	284	76	2884	153	1751	661	319	3809	n/a	1839	1916	54
Researchers	198	353	73	116	144	21	733	27	247	349	110	1843	n/a	507	1324	12
Technicians	114	242	118	92	22	10	1022	39	830	76	77	1548	n/a	1193	324	31
Other personnel	540	1478	595	720	118	45	1129	87	674	236	132	418	n/a	139	268	11
Total females [F]	n/a	n/a	n/a	n/a	n/a	n/a	610	28	276	204	102	751	n/a	385	339	27
Researchers [F]	n/a	10	n/a	n/a	n/a	n/a	170	4	33	104	29	360	n/a	106	251	3
Technicians [F]	n/a	8	n/a	n/a	n/a	n/a	115	4	89	9	13	352	n/a	270	68	14
Other personnel [F]	n/a	n/a	n/a	n/a	n/a	n/a	325	20	154	91	60	39	n/a	9	20	10

In addition to the above, data indicates that only 14% of research personnel involved in R&D hold a PhD or equivalent qualification, while 68% hold either a Master's or a Bachelor's degree. This is compared to 7% of personnel who have a tertiary diploma and 11% who either have a post-secondary diploma or non-tertiary diploma.¹⁷⁷

The Malawi University of Science and Technology (MUST) is playing an important role in the output of STI personnel. Established in 2012, MUST aims to provide quality education and training, as well as entrepreneurship, research and outreach in order to contribute to economic growth in Malawi. Departments in the University are: Engineering; Computer Science and Information Technology;

¹⁷⁴ National Commission for Science and Technology (NCST). (2017). Functions of the Commission. Op cit

¹⁷⁵ International Research Development Centre (IRDC). (2017). Malawi. Retrieved June 8, 2017 from <https://www.idrc.ca/en/what-we-do/regions-and-countries/sub-saharan-africa/malawi>

¹⁷⁶ UNESCO. (2014) Mapping Research and Innovation in the Republic of Malawi. Op cit

¹⁷⁷ Ibid

Biological Sciences; Applied Studies; Earth Sciences; Water Resources Management; Energy Resources Management; and Climate Sciences. The University has a capacity for 3,000 students, although there are currently only 1,300 students enrolled. There are 200 permanent staff, and 20 part-time staff.¹⁷⁸

4.4 Key Actors and Players

Actor/Player	Role and Area of Development
National Commission for Science and Technology (NCST)	Parastatal that advises government and relevant stakeholders on matters relating to science and technology in order to promote STI development in Malawi. ¹⁷⁹
MoEST	Represents the government in activities related to STI including policy development and promotion of STI. ¹⁸⁰
International Research Development Centre (IRDC)	Focuses on supporting farming systems including food security in Malawi and HIV and AIDS ¹⁸¹
World Bank	The World Bank has contributed US\$80 million for general budgetary support. ¹⁸²
Malawi University of Science and Technology (MUST)	Established in 2012, MUST aims to provide quality education and training, as well as entrepreneurship, research and outreach in order to contribute to economic growth in Malawi. ¹⁸³
UNESCO	Supports STI initiatives in Malawi through the Global Observatory of Science, Technology and Innovation Policy Instruments. (GOSPIN) ¹⁸⁴
National Research Council of Malawi (NRCM)	The National Research Council of Malawi (NRCM) is an arm of the Office of the President and Cabinet (OPC) and is involved in promoting research, science and technology for the Malawian nation. The body advises government on all STI related matters and does so in a way that keeps Malawi's socio-economic future in mind. This includes formulating policies in STI, implementing programmes, encouraging international collaboration, and encouraging demand-driven scientific and technological innovations that help Malawian people. ¹⁸⁵

4.5 Challenges facing the STI sector

UNESCO conducted a SWOT analysis on the STI sector in Malawi in 2014. Amongst the weaknesses within the sector that the report found were:

- Malawi has a small economy that is not effectively diversified;
- Political stability in the country is not optimal, which makes it difficult to implement STI policies;

¹⁷⁸ Malawi University of Science and Technology. (2017). MUST at a Glance. Retrieved June 8, 2017 from <http://www.must.ac.mw/about/must-at-a-glance>

¹⁷⁹ National Commission for Science and Technology (NCST). (2017). Functions of the Commission. Op cit

¹⁸⁰ Ministry of Education, Science and Technology. (2017). Homepage. Op cit

¹⁸¹ International Research Development Centre (IRDC). (2017). Malawi. Op cit

¹⁸² The World Bank. (2017). World Bank Resumes Budget Support to Malawi. Retrieved June 8, 2017 from <http://www.worldbank.org/en/news/press-release/2017/05/04/world-bank-resumes-budget-support-to-malawi>

¹⁸³ Malawi University of Science and Technology. (2017). MUST at a Glance. Op cit

¹⁸⁴ UNESCO. (2014) Mapping Research and Innovation in the Republic of Malawi. Op cit

¹⁸⁵ National Research Council of Malawi (NRCM). (2003). About NRCM. Retrieved June 11, 2017 from <http://www.sdn.org.mw/nrcm/aboutus/about.htm>

- There are both cultural and religious barriers to the proliferation of STI because there is a lack of understanding and an unwillingness to embrace scientific and technological principles, which makes it difficult to innovate in the country;
- There is a small number of researchers per STI sub-sector, which slows innovation and productivity down;
- There is no explicit human resources policy for science and engineering, meaning that there are no targets for scientists and engineers to meet in terms of staff numbers or requirements and research outputs;
- There is also low demand in the Science, Technology and Innovation sector; and
- Indigenous knowledge is still largely ignored.¹⁸⁶

Furthermore, the analysis notes some of the threats that face the STI sector in Malawi, some of which are:

- A great dependence on donor support, which is not consistent or guaranteed in the future;
- Demographic restrictions which include early marriage for girls, a high birth rate in a country that struggles economically, and teenage pregnancies;
- The effects of climate change which pose a threat to socio-economic development and the well-being of the population;
- Insufficient participation of the business sector in R&D; and
- Intermittent energy supply and difficulty in connecting ICTs are slowing down progress in STI.¹⁸⁷

¹⁸⁶ UNESCO. (2014) Mapping Research and Innovation in the Republic of Malawi. Op cit

¹⁸⁷ Ibid

5 Conclusion

Malawi has a very young population - of the entire population, 37.58% is between the age of 25 and 54, and of those who do not fit into this category, the majority are aged below 25. This can be regarded as a positive trait which can be leveraged in seeking to develop a knowledge society. However, the literacy rate – that is, the population over the age of 15 that can read and write – is 65.8% overall,¹⁸⁸ which proves to be a challenge.

The future of the knowledge society depends substantially on economic growth. Malawi's economic growth remained restricted in 2016 at 2.7%, but is expected to improve in 2017 with a projected growth of 4%, followed by an expected increase to 5% in 2018.¹⁸⁹ This gives the economy an overall positive outlook. According to the World Economic Forum, Malawi's Global Competitive Index score of 3.1 places the country at 134 out of 138 countries. A few of the major problems that the Index outlines are a lack of infrastructure, its technological readiness, and the size of its market. Some of the most problematic factors for doing business in Malawi are, in order of severity: access to financing, inflation and corruption.¹⁹⁰ Moreover, Malawi has an overall governance ranking of 17 out of 54 African countries, giving it a score of 56.6 out of 100. This score puts Malawi above the average score in Africa of 50.0, although it scores lower than the regional Southern African score of 58.3. If efforts are made to curb the aforementioned problematic factors outlined by the Global Competitive Index and to take advantage of the positive aspects of doing business in the country, Malawi will be able to successfully work towards the knowledge society.

ICT has been recognised as one of the drivers behind development, something that has been well articulated in the country's ICT policy. However, Malawi's ICT remains underdeveloped. The ICT Development Index (IDI) ranks Malawi at 168 out of 175 countries with an IDI value of 1.62. However, with the aid of the ICT policy, Malawi has the potential to overcome the challenges that it faces within the sector, which include little coordination on ICT infrastructure development, the sporadic availability of ICT services, scarce geographic coverage of these services, as well as too little institutional and human capacity in ICT services and low adoption rates of modern broadcasting technologies.¹⁹¹ Amongst the MACRA Strategic Plan's goals by 2020 are internet penetration of 25%, electronic commerce (e-commerce) penetration of 55%, and an 8% ICT contribution to GDP.¹⁹² If they are able to reach these targets, it will go a long way towards building a solid foundation for the knowledge society.

The Malawian education system has had its share of challenges. Although primary schooling is free and the intake for secondary school has increased in recent years, the quality of education is still insufficient. Exposure to ICT at school remains a luxury and teachers have little or no professional development in ICT, both of which pose a threat to the development of a knowledge society. However, there are numerous state interventions and NGOs working tirelessly to change this, and their impact is likely to bear fruit in years to come.

With regard to STI, it has been highlighted as a priority in the Vision 2020 and institutions like the MoEST, the MUST and NCST are working towards making science and technology more accessible to the general population. GERD expenditure has been relatively high and research output by scientists has been impressive, although more can be done in this respect. Fostering a social milieu in which STI is valued and celebrated can go a long way towards developing the desired knowledge society.

¹⁸⁸ CIA The World Factbook. (2017). Malawi. Op cit

¹⁸⁹ African Economic Outlook. (2016). Malawi. Op cit

¹⁹⁰ World Economic Forum. (2016). Global Competitiveness Index - Malawi. Op cit

¹⁹¹ Government of Malawi. (2011). Malawi Growth and Development Strategy II 2011-2016. Op cit

¹⁹² Malawi Communications Regulatory Authority (MACRA). (2015). Strategic Plan 2015-2020. Op cit

Ultimately, Malawi has a long way to go in achieving a knowledge society. The measures that have been undertaken thus far have provided a good start, but projects that make a larger impact and that do not rely so heavily on donor funding will be crucial. Equally as important will be solid governance mechanisms, political stability and public education that emphasises not only the importance of ICT and STI for the country, but also how these sectors can improve the lives of individuals across the country.

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June 1, 2017 from http://www.undp.org/content/dam/malawi/docs/environment/Malawi_State_of_the_Environment_and_Outlook_Report_2010.pdf

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About GESCI

The Global e-Schools and Communities Initiative (GESCI) is an international non-profit organisation founded on the recommendation of the **United Nations Task Force on Information Communication Technology** (ICT). GESCI was established in 2003 at the first World Summit on the Information Society.

The United Nations ICT Task Force identified **education as an area in critical need of development**, and one where **ICT has the potential to make a positive impact**. Initially GESCI was headquartered in Dublin, Ireland, and in 2011 moved its headquarters to Nairobi, Kenya.

GESCI's mandate is to assist governments in the socio-economic development of their countries through the widespread integration of technology for inclusive and sustainable knowledge society development.

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