OVERCOMING ECONOMIC CHALLENGES IN MALAWI

COMBATING CLIMATE RISKS IN AGRICULTURE AND ENERGY SUPPLY

As one of the poorest countries in the world, Malawi has to contend with many challenges that affect the country's economic performance. In particular, the damage caused by climate-related disasters has resulted in low agricultural yields in the country. Poor access to electricity due to inadequate grid expansion and climate-related disasters have a huge impact on people's standard of living. The proposed strategy to improve Malawi's economy includes:

- Efforts to improve the country's agricultural productivity through cash transfer and education programs, diversification methods and prevention of soil-loss through terracing and planting of vetiver grass.
- Interventions to increase access to electricity by investing in mini-grids promoted by renewable energy and the catalyzation of public-private partnerships.

TUM School of Governance

International Development, Poverty and Inequality

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Introduction

What is the issue?

With an estimated 20.41 million inhabitants in 2022 and an annual growth rate of 2.6%, Malawi is one of the **poorest countries** in the world. Even though the government presented the "Malawi 2063 Vision" in 2021, which aims to transform the country into a state with healthy growth and economic stability, the country is economically in a bottleneck (World Bank 2024a). A total of **83 percent of Malawi's population** lives **in rural areas**. Nevertheless, the country has a high urbanization growth rate of 4.1% (World Bank 2022). In 2024, the gross domestic product amounts to 11.24 billion US$. Calculated in terms of per capita GDP, the figure is **481 US$ per capita** (International Monetary Fund 2024). This makes the country a **low-income country**. Even though the GDP per capita value has risen again since 2017, the country experienced a decline in 2020. GDP generation is mainly concentrated in central and southern areas (World Bank 2022). In terms of labor productivity, Malawi's population over the age of 15 had a **labor force participation rate of 68.3 percent** in 2020 (World Bank 2024b). **Agriculture** has the highest share of employees at over **70 percent**, followed by services and industry (World Bank 2022). 70 percent of the population live on less than 1.90$ a day and just 34% have an account with a financial institution (Opportunity International 2024).

Prevailing poverty in Malawi is exacerbated by various influencing factors. The **land is becoming increasingly degraded** due to increasing population pressure and heavy agricultural utilization. The **dependence on rain-fed agriculture and the intensification of natural disasters due to climate change** pose major challenges to the country's sustainable growth (World Bank 2022). Various studies have found that the agricultural sector suffers the highest loss due to climate change. Overall, it is estimated that the state suffers an annual **loss of at least 5 percent of annual GDP** due to climate change (International Food Policy Research Institute 2023). Another major obstacle, which is further exacerbated by climate change, is the lack of electricity. The state is one of the least electrified countries in the world. **Only 42 percent of the urban population and 4 percent of the rural population have access to electricity.** This leads to an enormous restriction of the country's economic productivity (Africa Hub n.d.). In order to seriously implement Malawi's 2063 development goals, it is of enormous importance to make major reforms that promote macrostability, growth and resilience (World Bank 2023).

In order to efficiently improve the standard of living and thus improve the economic potential of the state, the government must adapt policies that:

- Reduce the vulnerability of the agriculture by teaching farmers new farming techniques, as well as by enabling funds and
- Increase access to energy supply while reducing vulnerability to external disasters.

Approach

The following policy brief synthesizes various literature sources to identify adequate solutions to the agricultural crisis and the prevailing energy shortage. Where possible, literature reviews have been used to gather as qualitative results as possible. The proposed approaches are mainly based on studies conducted in countries that are similar to Malawi's economic status, i.e. low-income countries.

In order to make the interventions as applicable as possible, an attempt was made to include interventions from Sub-Sahara Africa in the literature. Furthermore, this policy brief considers Malawi's limited financial leeway and its exposure to climate risks and adapts the solutions accordingly.

Issue: Agriculture - Background

Since the agricultural sector is essential to the economic productivity of the Malawian people, it is in the country's best interest to protect the sector. The sector accounts for a large share of the economy and requires the majority of labor force. Only a small part of the cultivated land is irrigated. An increase in irrigation means an increase in costs. This is the reason why the crop is vulnerable to different levels of rainfall. A total of **80 percent of Malawi's population practises rainfed agriculture**. Figure 1 shows how much agricultural productivity has declined. Only pigeon peas grow more than one percent per year. All other crops experience poor yields. These low-yield years can make the country even more vulnerable to various economic shocks. One reason for the low yield is the high weather variability due to climate change (International Food Policy Research Institute 2023).

Crop	Hectares harvested	Annualized yield growth
Maize	1 726 566	–3.6%
Groundnuts	401 695	–2.8%
Beans	356 594	–1.0%
Sweet potatoes	292 271	NA
Pigeon peas	251 254	6.6%
Cassava	240 778	0.9%
Soybeans	182 941	–0.1%
Sorghum	112 501	0.4%
Cowpeas	103 340	–0.8%

Figure 1: Top 9 crops in Malawi by harvested area, averaged from 2018–2020, and annualized yield growth based on regression analysis from 2009–2018 (International Food Policy Research Institute 2023).

One example is the recent drought, which was caused by El Niño. This drought is the worst in the last hundred years. The country had to declare a state of emergency due to very low food stocks. The country **consumes 3.5 million metric tons** of maize per year, but a harvest of **just 2.9 million metric tons** was possible for the end of the season (Duchoslav et al. 2024). This major humanitarian crisis clearly shows how bad the situation is for agriculture and the population in Malawi. Another problem that is spreading due to climate change and inadequate harvesting techniques is that of soil loss. Studies have found that soil loss in Malawi is progressing at an alarming rate. An **increase of 10% soil loss would lead to a loss of 0.26% of national GDP and 0.42% of agricultural production value** (UNEP and UNDP 2018). However, it is not only climate change that is contributing to the country's poor agricultural productivity, but also poor agricultural practices, as farmers have little knowledge of how to deal with weather shocks (Chimpokosera-Mseu 2020).

Issue: Agriculture - Empirical Evidence

A systematic analysis of farmers' decisions on adoption strategies against negative impacts of climate change in Africa shows various efficient methods to make agricultural practices cheaper and more effective. **Diversification** is the main method used. It describes a mixture of strategies with the aim of making agricultural output as cost-effective and efficient as possible. Predominant strategies are **crop and livelihood diversification**. This is an agricultural system in which additional crops are grown on a particular farm. Attention is paid to what yields can be achieved from value-adding crops depending on the available market opportunities (Magesa et al. 2023). As Lakhran et al. (2017) point out, this type of system can help to **protect biodiversity, strengthen the resilience of agricultural systems and combat the risk of crop failure due to climate change**. It also improves the degradation of natural sources by **improving soil quality and water quality**. Another advantage is that farmers benefit economically through higher yields. The study emphasizes that farmers can only use these techniques if they acquire **knowledge of suitable cultivation techniques and climate-resilient methods** (Lakhran et al. 2017). One study takes a closer look at the development of diversification methods by farmers in Malawi and Tanzania. Results show that smallholder farmers are already increasingly relying on diversification methods. Various tools are identified which are important for a more efficient dissemination of the method. In addition to **educating and training farmers**, it is important to **provide** them with the right tools such as **high-quality seeds, fertilizers and irrigation systems**. This must be achieved through adequate financial support. Furthermore, **weather and climate information** will be needed to better prepare farmers for the challenges (Makate et al. 2023).

According to Wens et al. (2022), vulnerability to droughts can be reduced using similar tools. The study, which focuses primarily on south-eastern Kenya, came up with the following proposed solutions. Top-down interventions in particular are considered helpful. These include **early warning systems, credit systems and training**, which can increase the acceptance of drought adaptation measures. For example, credit programs lead to a 30% higher acceptance of measures, early warning systems to 22% and ex-ante cash transfers to 25%. A combination of all interventions could even lead to a 139% increase in the uptake of measures and thus significantly reduce poverty and food insecurity (Wens et al. 2022).

Issue: Agriculture - Empirical Evidence

In order to tackle the problem of soil loss, the Food and Agriculture Organization of the United Nations (2018) found out which options for action are crucial in Malawi to combat it. It turns out that the most effective practice is to plant vetiver grass and cultivate terraces. The results show that maize productivity can be increased by 275kg/ha. Thus, adaptation to these measures by farmers could **reduce GDP costs by up to 70%**. This suggests that the government should focus on investing in farmer education in addition to providing assistance for the measures (UNEP and UNDP 2018).

Large financial resources are required to enable farmers to implement these recommendations. A study analyzes the effectiveness of **cash transfers** in Senegal to manage agriculture. The study suggests that large, one-time cash transfers can have a significant impact on agricultural production. The effectiveness of these transfers could be enhanced by accompanying support and advice. The paper highlights the potential of large cash transfers as they **can be effective for small farms and are easier to implement and scale than other interventions** such as microcredit or more frequent smaller transfers. It also extends the discussion of financial training for small businesses to the agricultural sector (Ambler et al. 2017). This study suggests that governments and international organizations can have a major impact on agricultural productivity through such investments.

Issue: Electricity Supply - Background

Despite recent efforts to improve the energy supply, access to electricity in Malawi is limited. In 2022, only **12.0%** of the population had electricity. Sub-Saharan Africa is one of the least developed regions in the world. Overall, 49.4% have access to electricity there (IEA 2023). A comparison with the Sub-Saharan African average clearly shows how poor the infrastructure in Malawi is. Figure 2 shows how access compares to other African countries. It is evident that there is an urgent need to expand the infrastructure.

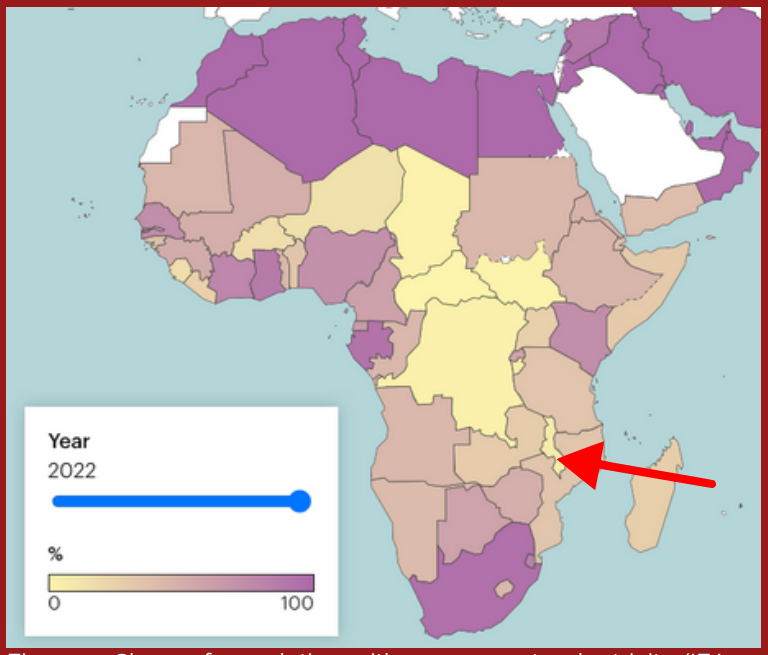

Figure 2: Share of population with no access to electricity (IEA 2023).

One of the reasons for inadequate access is Malawi's **heavy reliance on hydropower**. According to USAID, Malawi had a general generation capacity of **439 MW** in 2019. Of this, **384 MW came from hydropower** (USAID 2019). This fact turns out to be a major challenge due to Malawi's vulnerability to extreme weather events triggered by climate change. In 2019, Tropical Cyclone Idai hit Africa's east coast, bringing severe weather risks such as storms, landfall, storm surges and flooding. Due to the heavy flooding and debris around the power plants, two important hydropower plants were shut down, reducing hydropower capacity to just 50 MW. As a result, there were disruptions to the electricity supply across the country for several days (IEA 2020). This heavy dependence on one energy source makes it clear that Malawi needs to change its infrastructure, because in addition to its high vulnerability to flood events, droughts are another problem.

Between 1970 and 2013, for example, droughts around the greater Lake Malawi Basin have increased in their impact. Further climate change will have an even greater impact on river flows and thus on hydropower generation (Mtilaltila et al. 2020). One reason why the expansion of the electricity grid cannot be sufficiently promoted is the **lack of sufficient energy supply and the limits to grid extension**. Access to electricity is another aspect that reinforces the country's poor economic situation. According to a study, **power outages cost the country around 2-3% of GDP** (Taulo, Gondwe & Sebitosi 2015). Cyclone Freddy led to a **production loss of 36.4 million US$**. This amounted to a GDP loss of 0.5% in 2023 (World Bank 2023). Urgent action is needed to save Malawi's economy and thus its population.

Issue: Electricity Supply - Empirical Evidence

In a meeting, the Energy Sector Management Assistance Program (ESMAP) discussed the **expansion of mini-grids** in order to implement access to electricity in low-income countries as quickly and cost-effectively as possible. According to the report, these mini-grids are important for achieving the UN Sustainable Energy for All goal of universal energy access by 2030. Initial problems with grid expansion are mainly due to a **lack of knowledge and exposure to global best practices**. Examples from the mini-grid expansion in Nigeria show that the expansion was successful through a combination of different actions. In addition to the creation of a Rural Electrification Fund to finance the electrification expansion, it was necessary to **collect data** to find out which **locations** are particularly suitable for the installation of such mini-grids. In addition, the creation of a regulatory framework is crucial to ensure that electrification progresses, especially in rural areas. This is achieved by attracting the attention of the private sector, communities and NGOs (ESMAP 2017).

The effectiveness of mini-grids is demonstrated by Robert and Gopalan (2018). According to them, the creation of a new energy system with microgrids and renewable energy is a cost-effective way to distribute energy. It is seen as the possible start of a third industrial revolution. The authors compare the expansion of a centralized energy grid with a stand-alone microgrid expansion. Results show that in low-income countries, relying on additional renewable energy systems through microgrids can **reduce electricity costs by 26%** and also **reduce energy supply interruptions by 40%**. Compared to a simple extension of the centralized grid, microgrids can **reduce grid loss by 62.5%**. This solution is particularly efficient for villages that are far away from the grid and whose expected security of supply is low. The authors state that this result can be used to provide villages with access to electricity until they can be connected to a centralized grid (Robert & Gopalan 2018).

Mini-grids

"A mini-grid is a set of small-scale electricity generators and possibly energy storage systems interconnected to a distribution network that supplies electricity to a small, localised group of customers and operates independently from the national transmission grid. They range in a size from a few kilowatts up to 10 megawatts" (Green Mini-Grid Helpdesk n.d.).

Issue: Electricity Supply - Empirical Evidence

In a literature review on the possibility of mini-grids or grid expansion in Sub-Saharan Africa with a focus on Namibia, the authors state that mini-grids are **more compatible for countries in Sub-Saharan Africa** due to their more cost-effective application. In particular, testing of other off-grid systems is recommended (Mehta et al. 2022).

A focus on off-grid solar solutions offers an efficient solution. A literature review on the impact of off-grid solar energy expansion in the Global South and how it affects local and national economic development shows that most studies show **positive effects on income, savings, employment and productivity** (Radley & Lehmann-Grube 2022).

In order to ensure financing for the expansion of the energy sector in Malawi, it is extremely important to establish public-private partnerships. This type of partnership offers a **cost-effective solution that is less susceptible to regulatory barriers**. The main advantages of this type of partnership are as follows:

- Extending limited public funds for infrastructure projects.
- Involving private sector expertise, innovation and efficiency.
- Ensuring on-time and on-budget project delivery through performance-based contracts.
- Long-term value through risk transfer to the private sector.
- Promoting the transfer of know-how and improving competitiveness and service quality (Ronge et al. 2024)

Public-Private Partnerships

First, the government can take a stake in the project once a concession contract is signed, actively participate in its development and earn a risk-adjusted return. Secondly, the government can act as the off-taker, usually through its public utility company, and commit to purchasing the project services over a certain period of time, guaranteeing the private partners a secure income. The form of off-take agreements varies depending on the type of asset (e.g. generation, transmission, distribution) (Ronge et al. 2024).
Even though Malawi already relies on PPPs in the energy sector, intensifying these partnerships is of enormous importance in order to make comprehensive changes in grid expansion possible.

A study by Fleta Asín and Muñoz Sánchez (2021) underlines the relevance of public-private partnerships in renewable energies in developing countries. One result of the study is that support from multilateral development banks in countries with major economic and institutional weaknesses has a **positive influence on attracting private investors** (Fleta Asín & Muñoz Sánchez 2021).

Policy Recommendations

The government of Malawi must do the following to improve the country's economical situation:

Agricultural Development

- **Educating farmers on climate-resilient farming techniques (especially diversification, the planting of vetiver grass and terrace cultivation)**
- **Providing cash transfers to farmers**
- **Delivering seeds, fertilizers and irrigation systems to farmers**
- **Tracking weather and climate as well as creating early warning systems for population**

Access to Electricity

- **Promoting the installation of mini-grids, especially powered by solar energy**
- **Provision of technical know-how on how to build and maintain mini-grids**
- **Collecting data on favorable locations for mini-grids**
- **Intensifying the mobilization of public-private partnerships**

Broader objective:

- **Improvement of international cooperation with governments, international organizations, private investors and multilateral development banks**

Limitations

The recommendations presented are based on a review of existing literature. The literature utilized draws from solutions implemented in countries with economic and climatic conditions similar to those of Malawi. Consequently, the application of these solutions to Malawi is considered valid. However, it must be noted that problem-solving approaches cannot be universally applied to all countries, as various factors influence how issues are addressed. Therefore, it is crucial to consider the **specific context of the country**.

Further limitations arise particularly from Malawi's **limited financial resources**. Even though the proposed solutions are cost-effective and efficient, successful implementation relies heavily on the **effective mobilization of international donors and investors**. For this reason, it is essential for the government to act swiftly to improve the economic situation and, in turn, enhance the overall well-being of the population.

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