Manuscript Title

This manuscript (permalink) was automatically generated from opennaps/malawi@66fed0f on March 2, 2021.

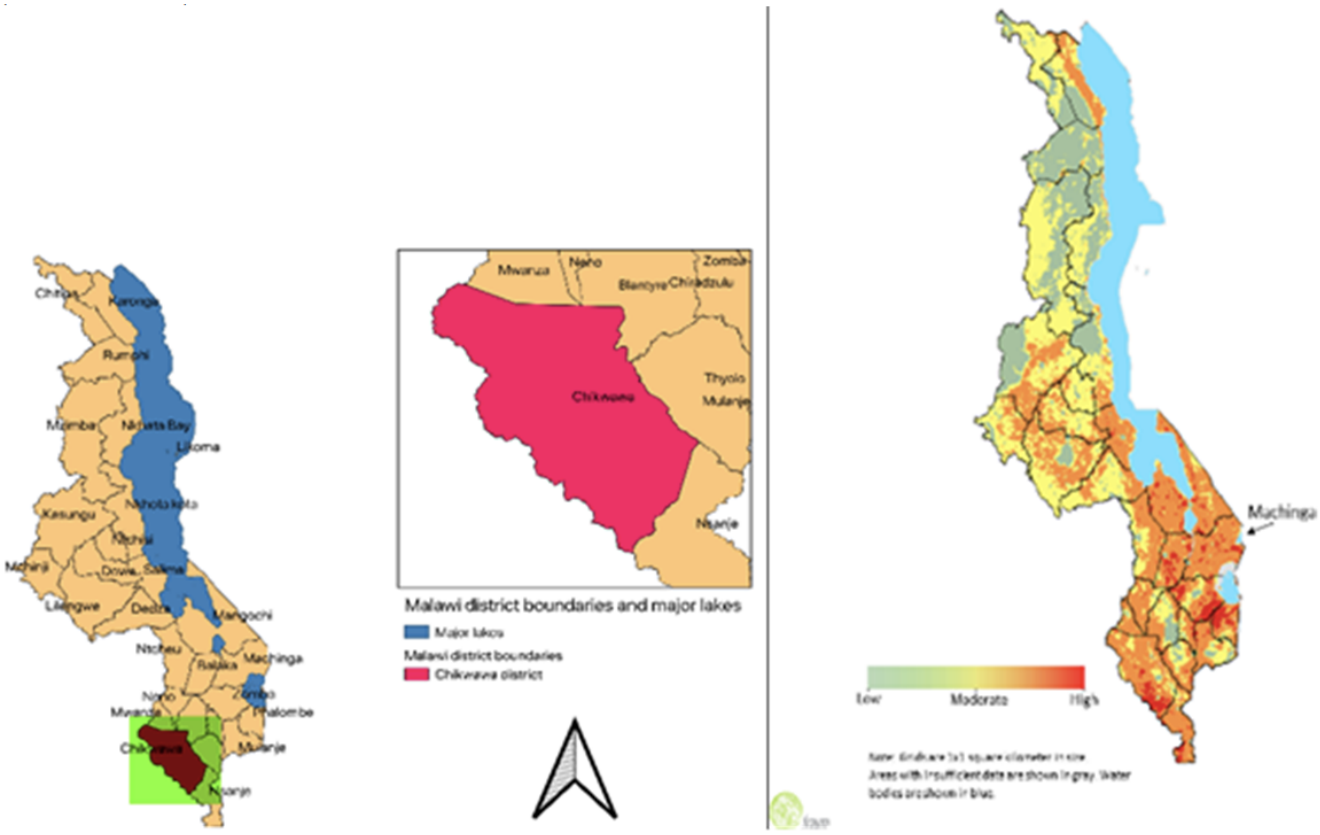
Authors

- **John Doe**
  XXXX-XXXX-XXXX-XXXX · johndoe · johndoe
  Department of Something, University of Whatever · Funded by Grant XXXXXXXX

- **Jane Roe**
  XXXX-XXXX-XXXX-XXXX · janeroe
  Department of Something, University of Whatever; Department of Whatever, University of Something

Abstract

Geographically, Malawi is a landlocked country in southern Africa bordering Mozambique, Tanzania, and Zambia (Masi 2017). The country has a total area of 118,484 km2 of which 20% is covered by Lake Malawi. The country's topography is varied. In the mountainous sections of Malawi surrounding the Rift Valley, plateaus rise generally 800 m to 1,200 m above sea level, although some rise as high as 3,000 m in the north. Malawi experiences sub-tropical climate conditions and annual changes between wet and dry seasons. The wet season generally occurs between November and April and the dry season between May and October. Average temperatures range between 18° and 27°C, and the wet season can bring average monthly rainfall in the order of 150 mm to 300 mm (Masi 2017). Annual rainfall ranges from 500 mm in low-lying areas such as the Shire Valley to above 3,000 mm in the northern highlands (USAID 2017a).



image

Left panel: District map of Malawi. Source: doi: https://doi.org/10.1371/journal.pone.0242226.g001; Right panel: Malawi Climate Vulnerability Map. Source: https://fraym.io/malawis-adaptive-capacity-to-climate-change/final_map/

Malawi is characterized by widespread poverty, and a rapidly growing population with high population density, putting pressure on land, fisheries, water and other natural resources (Masi 2017). Malawi is already experiencing some of the effects of climate change with observed rising temperatures and changes in the variability of rainfall (Masi 2017). Adverse impacts have already resulted in considerable damage, disrupted economic activity and adversely affected the lives of large number of people, particularly the poor who are the most vulnerable to weather related shocks (Masi 2017). Challenges resulting from climate change include (Masi 2017): dry spells and seasonal droughts linked to crop failures, food security and nutrition availability; intense rainfall associated with severe riverine and flash floods and damaging infrastructure including roads, bridges, schools and health facilities; soil erosion due to intense rainstorms combined with ongoing degradation of upstream catchments causing high sediment deposition loads in rivers hence massive siltation in Lake Malawi that adversely affects hydropower energy generation; heat stress and outbreaks of livestock diseases like Newcastle disease in chickens and African Swine Fever in pigs; degraded grazing fields resulting to low fodder availability and quality; competition for resources like water and grazing land; denudation of forests and woodlands driven by biomass energy demand also causing biodiversity loss; increase in disease incidence and transmission of cholera, schistosomiasis and malaria.

Executive Summary

Malawi is experiencing climate related hazards and extreme events which are increasing vulnerability of the communities to climate change across all sectors (Irish Aid 2018) with reports of extreme weather events (that is, droughts, heavy rains, and floods) increasing from just one during the 1970s to nineteen between 2000 and 2006 (Hughes et al. 2019). Mean temperatures have risen by an average rate of 0.21°C per decade, with comparative increases in evapotranspiration (Hughes et al. 2019). Extreme weather events that occur frequently in the country include dry spells, seasonal droughts, intense rainfall, riverine floods and flash floods (Masi 2017). Impacts include the Phalombe flash floods in 1991 that killed over 1,000 people, and wiped out villages, crops, livestock and property (REF) and an intensive 2015 flood event in XX area that left many lives and livelihoods destroyed (Irish Aid 2018). The effects of the climate changes and extreme weather events are compounded by a number of other factors. Extensive land use, including the massive cutting down of trees on the Middle and Upper Shire Valleys, has resulted in severe land degradation and soil erosion, leading to siltation of the Shire River and its tributaries, seriously affecting hydro-electric power generation, human health and fisheries (UNFCCC 2006). Soil degradation which is a major challenge in Malawi has soil losses averaged at 20 T/ha/year translating to a 4% - 25% annual yield loss (Irish Aid 2019). The average annual national soil loss rates were estimated at 29 tons per hectare in 2014, with soil erosion and nutrient depletion reported to affect more than 60% of Malawi's land area. Unsustainable farming practices, an increased demand for agricultural land and wood fuels associated with a growing population have all been attributed to cause this degradation with chemical land degradation, including soil pollution and salinization/ alkalization, leading to 15% loss in the total arable land in Malawi in the last decade alone. Between 2008 and 2016, majority of urban households relied on biomass energy with a 35% increased charcoal demand worth more than USD 66 million in 2016 providing employment opportunities for over 235,000 people (Hughes et al. 2019). This has a huge impact on agriculture which is the main economic activity of the country contributing to over 80% of the country's GDP.

Malawi is among the dozen most vulnerable countries globally in terms of adverse effects of climate change, especially drought, but also floods/heavy rains. Heavy dependence on rain-fed agriculture of both the national and local economies, and for the livelihoods of the majority (85%) rural population

makes Malawi particularly vulnerable. The rains can start as early as October, especially in the south of the country and can end as late as May, especially in the north of the country (Malawi, 2015). This early rains and extended rains disrupt the agricultural cycle hence having a negative impact on food production in the country. Factors including high population density and poverty, small landholding sizes, and the low-input low-output farming systems exacerbate farmers' vulnerability and reduce the resilience of agricultural systems and adaptive capacity of farming communities to effectively respond to adverse CC impacts or take advantage of emerging opportunities (Zulu 2017). Malawi, with a 3.06% annual growth rate (Masi 2017), has high incidences of poverty, violence, unemployment, malnutrition, HIV and AIDS, high illiteracy rates, poor health, and psychological disorders which characterize the country's young population (MDGS II 2011-2016) (Irish Aid, 2018). About 85% of the people live in rural areas and derive their livelihoods from natural resources and agriculture (from small land holdings of between 1.0 and 5.0 ha per household of five people), with the remaining 15% residing in urban areas (Malawi Vision 2020). The changes in climate and land cover and use are exacting significant adverse impacts on the economy of Malawi. A 1-in-10 year drought event would have an estimated adverse impact of 4% on the annual GDP of Malawi, with even larger impacts for 1-in-15 and 1-in-25 year events (Malawi 2015). The Government of Malawi (GoM) has estimated that 29 metric tons of soil per hectare are lost each year, costing the country an estimated 8% of its annual gross domestic product (GDP) (GOM 2001) (USAID 2017b) and for the period 2001 to 2009, the annual costs of land degradation have been estimated at USD 244 million per year, an amount equivalent to 6.8% of Malawi's country's GDP. There has been migration from rural to urban areas (at the rate of 3.6% per year), and from densely populated to sparsely populated areas or districts over the decades from areas adversely affected by climatic hazards (especially floods and drought) to safer upland areas or other districts (MoECCM 20181) and in search of income earning opportunities (Malawi Vision 2020).

National Adaptation Plans (NAPs) are generally important in several ways. For instance, if countries fail to build resilience of people, places, ecosystems and economies to the impacts of climate change, they risk losing the hard won sustainable development gains. The most unfortunate part is that poor countries are more vulnerable to the devastating impacts of climate with Malawi being one of the poorest countries in the world, ranked 170 of 188 countries on the global United Nations Development Programme's HDI. Given the climate related challenges faced by Malawi, a NAP will identify and provide a roadmap on key adaptation measures required to address key adaptation needs and processes to ensure that these measures are mainstreamed into the national planning and development processes and programmes across systems and sectors. The country's Intended National Determined Contribution INDC noted the need to enhance resilience of productive sectors like rain fed agriculture to the associated negative impacts of climate change. The 2016 Malawi National Climate Change Policy noted the need to effectively manage the impacts of climate change through interventions that build and sustain the social and ecological resilience of all Malawians; with the regulation of greenhouse gas emissions to the atmosphere at a level that would prevent dangerous human-induced interference with the climate system within a timeframe that enables social, economic and environmental development to proceed in a sustainable manner. It notes that climate change needs to be integrated into planning, development, coordination and monitoring of key relevant sectors in a gender sensitive manner and through an appropriate institutional framework. The 2006 NAPA sought to increase the adaptive capacities of vulnerable communities to adverse effects of climate change through a number of initiatives, such as: improving community resilience to climate change by the development of sustainable rural livelihoods; restoring forest in Upper, Middle and Lower Shire Valleys catchments to reduce siltation and the associated water flow problems; improving agricultural production under erratic rains and changing climatic conditions; improving Malawi's preparedness to cope with droughts and floods, and; improving climate monitoring to enhance Malawi's early warning capability and decision making and sustainable utilization of Lake Malawi and lakeshore areas resources. The NAP process seeks to reduce vulnerability to the impacts of climate change by building adaptive capacity and resilience while

integrating climate change adaptation into relevant new and existing national development policies, programs and activities.

Framework for the NAP

As indicated in the introduction section above, Malawi's geographical characteristics and the prevailing socioeconomic conditions among the majority of its population, makes it one of the most vulnerable countries to the impacts of climate change globally. The country has been experiencing unpredictable weather patterns characterized by poor distribution of rainfall, causing dry spells, droughts and floods. Devastating droughts and floods witnessed in recent years and high temperatures cause food insecurity affecting millions of its population through low agricultural yields as a result of reduced soil moisture and inflated food prices. Drought lowers hydroelectric power production in the Shire River by reducing the flow rates in the river as a result of complete drying up of some of the tributaries that feed into Lake Malawi. Lake Chilwa, a notable wetland, is drying up. These have made agricultural production and the country's agro-based economy extremely vulnerable. Land degradation and loss of soil fertility, decreasing availability of safe water for humans and livestock as water tables recede, forest fires, floods resulting in severe crop loss and infrastructure damage including roads and the only rail line that links the south to the centre, all result in serious socio-economic disruptions, food and water insecurity, and diseases such as diarrhoea, cholera and malaria. Increased temperatures, droughts, and floods will also result in a range of direct and indirect impacts to health, with malaria being of particular concern to Malawi because as temperatures becomes warmer, it will become more suitable for breeding of mosquitoes even at higher altitudes, which historically have not been exposed to the disease. All these changes among others are depressing economic activities, with significant impact on national GDP, and diminishing the wellbeing of the large population of rural dwellers (85%) whose livelihoods depend on wetlands, livestock and natural resources, as well as the urban poor who have to contend with unemployment and inequality

The National Adaptation Planning process which was initiated during the seventeenth session of the Conference of the Parties (COP) to the United Nations Framework Convention on Climate Change (UNFCCC) is today an essential component of planning at all levels because climate change is an issue that has to be addressed over the long-term. The process enables developing and least developed country (LDC) parties to assess their vulnerabilities, mainstream climate change risks, and to address adaptation across all key sectors that are impacted by climate change (LEG, 2012). Further, it is essential that developing country and LDC parties integrate adaptation planning in the broader context of sustainable development planning2 because climate change risks disproportionately magnify development challenges in these countries as compared to developed countries (LEG, 2012). The national adaptation plan (NAP) process was, therefore, established by the COP as a pathway by which effective adaptation planning in LDCs and other developing countries can be facilitated. The Government of Malawi embarked upon the National Adaptation Plan (NAP) process to adopt a medium-term approach for reducing vulnerability to climate change impacts, and to facilitate the integration of climate adaptation into ongoing planning processes at national and subnational levels.

The agreed objectives of the national adaptation plan process are (LDC-EG, 2012): (a) To reduce vulnerability to the impacts of climate change, by building adaptive capacity and resilience; (b) To facilitate the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

The implementation of the NAP process is intended to:

- build on existing CCA planning processes and initiatives in order to provide continuity with previous planning efforts;
- build on past implementation successes;
- eliminate duplication of effort; and
- avoid repetition of implementation failures.

Essential functions of the NAP process

The NAP for Malawi will serve the following functions:

1. Enhanced institutional coordination- Provision of oversight on climate change activity implementation by NSCCC and the NTCCC providing a platform for efficient and effective implementation of national, regional, and global partnerships on climate change.

2. Strengthen the capacity of Malawi's government at all levels to implement a NAP process. MDAs will provide the data and information needed at various stages of the NAP process.

3. Nationally agreed adaptation targets that are mainstreamed into sectoral strategies like the MGDS III and policies which will provide for building of climate change resilience through regular development budgets. National Climate Change Investment Plan will assist the NAP process in resource mobilization.

4. A timetable and a work-plan to harmonize the main policy inconsistencies across Malawi's policy and legal frameworks that are relevant to climate change adaptation, which again will provide for building of climate change resilience through regular development budgets.

5. Incentivized government technical officers through professional development strategies. Capacity development will entail holding regular working group meetings and developing training programs for working groups based on prior training needs assessment. Working group meetings will come up with terms of reference and a training program for climate risk and vulnerability assessments, economical appraisal and design of adaptation pathways.

6. Tools and mechanisms established to promote iterative adaptation planning. Relevant institutions, individuals and organizations involved in CCA will be encouraged to adopt and use this CCA blueprint to build climate change resilience and contribute to the sustainable socioeconomic development of the country.

7. Enhanced access to adaptation finance that delivers the country's adaptation targets effectively. The National Climate Change Investment Plan and the National Climate Change Fund both have stipulated how they will manage fiduciary risks in dealing with the financial resources. Financial integrity in the NAP process will be further assured by adhering to government operating procedures on financial management and procurement as contained in Malawi's Financial Management Act. In addition, the NAP budget will be tabled by the Minister of Finance to the National Assembly during presentation of the annual government budget for approval. All NAP work-plans will be presented to the National Technical Committee on Climate Change and the National Steering Committee on Climate Change for endorsement and approval. This will ensure accountability and transparency.

8. A promotion of private sector engagement in businesses that will meet market demand for adaptation technologies and services. This will be achieved through the engagement of the Malawi Confederation of Chambers of Commerce and Industry (MCCCI) as a go-between to coordinate and facilitate private sector engagement. There will have to be a clear plan/structure for regular and sustained engagement.

9. Identify and address capacity gaps and needs to ensure that adaptation strategies are properly designed and implemented.

The NAP as the umbrella programme for adaptation

The National Adaptation Plan (NAP) addresses the effects of climate variability and climate change in Malawi with a systems approach – a departure from a sectoral approach. The framework prioritizes transformative investments for addressing the impacts of climate change on the national economy with a focus on building the resilience of vulnerable communities. The NAP evolves from a background of experience in the National Adaptation Plan of Action (NAPA). Contrastingly, the NAPA was designed to address urgent and immediate needs of the country, created to act as a channel through which the country could access support quickly and take advantage of win-win measures that would avoid increased damages and be more expensive to implement in the future. The NAPA was designed more than 10 years ago, when the country was experiencing heightened levels of vulnerability to floods, drought, and other adverse effects of climate change. With emerging and additional science and knowledge about climate change and its impacts, this NAP provides a framework for awareness and capacity for medium- and long-term adaptation in the various systems which support national socio-economic development. The current Malawi Vison 2063 (MW2063) – aspires to embrace ecosystem-based approaches in managing the environment. With climate change, Malawi has made commitment to develop systems to break the cycle of environmental degradation and increase resilience, sustainable development and planning as well as the promotion of climate change adaptation, mitigation, technology transfer and capacity building for sustainable livelihoods through Green Economy measures. The NAP framework is a direct contribution to the UNFCCC commitment and the MW2063.

There are several development programmes and activities that are taking place in Malawi at national and local governments under national government ministries and parastatals or through bilateral arrangements and partnerships with private sector entities, which need to be buttressed to be resilient to the impacts of climate changes in order to be able to effectively contribute to targeted development outcomes. Among many others, these include, for example:

- Lilongwe Water and Sanitation Project Malawi by Lilongwe Water Board jointly with Lilongwe City Council to increase access to improved water services and safely managed sanitation services in Lilongwe City;

- the Shire Valley Transformation Program in Chikwawa and Nsanje Districts in the south of Malawi to increase agricultural productivity and commercialization for targeted households and to improve the sustainable management and utilization of natural resources.

- The Social Cash Transfer (SCT), locally known as Ntukula Pakhomo Programme by the Ministry of Gender, Children, Disability and Social Welfare to cushion the poor and marginalized;

- The Public Works Programme (PWP) implemented by the Ministry of Local Government and Rural Development through the National Local Government Finance Committee (NLGFC) it provides regular payments to individuals in exchange for work, with the objective of decreasing chronic or shock-induced poverty and providing social protection.

- The School Feeding Program implemented by the Ministry of Education to improve child nutrition, increase children's' ability to concentrate in class, promote enrolment and regular attendance'

- The Fertilizer Input Subsidy Programme (FISP) implemented by the Ministry of Agriculture to reduce poverty and ensure the country's food security by fostering an increase in agricultural productivity levels.

- The Cement and Malata Subsidy Programme that seeks to provide affordable access to building materials by the poor.

- The Increasing Access to Clean and Affordable Decentralized Energy Services (IACADES) Project under the Ministry of Energy with funding from UNDP and GEF among other sources.

- Community Energy, an energy company funded by the Scottish government aims to help support energy-inefficient countries and to implement new energy-based programs to provide electricity to rural areas, focusing on personal electricity and solar projects, as well as hydro and cooking stoves for communities in rural areas, with 104 rural communities benefitting so far from the installation of install personal renewable energy units. Twelve districts of Malawi have so far received direction and access to these units, and each will begin to produce and regulate their own energy, with Community Energy's support.

Given its cross-cutting nature which includes, inter alia, considerations of adaptive capacity and resilience at systems level while considering also the individual, institutional, and systemic factors, and its mainstreaming into governance and development planning structures, the NAP offers an appropriate umbrella under which national programmes for adaptation can be jointly framed, coordinated and implemented. The NAP will present an aggregate national adaptation plan that will link to appropriate local, subnational, national, and sectoral activities and action plans, maximise on efficiencies, minimise duplication of efforts, and leverage on cost constraints to programme implementation. The NAP process shall also add value to past and current activities by identifying capacity gaps, especially for the design and implementation of medium-term climate change adaptation priorities, as well as by accessing opportunities for international funding to develop more effective climate responsive planning and budgeting. The Malawi NAP coalesces all the discrete climate change adaptation plans and programmes that are or shall be implemented in the country. It comprises of collated, synthesised and analysed data of climate change trends and its impacts, aggregated from local level and downscaled from regional analyses, as well as related peculiar vulnerabilities at scale within and across regions and systems, and identifies gaps and capacity needs that should be addressed. This information will be used to identify and prioritise adaptation options, and to put in place plans to implement the proposed adaptation options, as well as how to finance them. Finally, a monitoring and evaluation framework is determined for the different programmes to track progress and to make adjustments where necessary. Periodic updates (every four years) shall be undertaken to ensure that the NAP is responsive to new and emerging needs and offers an effective mechanism for climate change adaptation at scale.

Coherence with national development context, SDGs, Sendai and other relevant frameworks

The Malawi Vision 2020 is anchored on six pillars, namely; Good governance and a capable state, Human resource development and a knowledge-based economy, Private sector-led development, Infrastructure development, Productive high value and market-oriented agriculture, and Regional and international integration. The vision noted that air pollution and climate change issues though then relatively small could become serious challenges if unchecked. The vision hence identified the strategic challenges to prevent air pollution and climate change issues as: monitoring emissions of

hydrocarbons nitrogen oxides and carbon monoxides; proper management of hazardous substances and wastes; use of ozone friendly technology; establishing regulations and enacting legislation on air pollution; and promoting education on climate change issues. The Malawi vision statement highlights Malawi as an 'environmentally sustainable,' 'self-reliant with equal opportunities for and active participation by all,' and 'having social services, vibrant cultural and religious values and being a technologically driven middle- income country.' This aligns with the vision of the NAP vision for Malawi of "a country with people, ecosystems and infrastructure that are resilient and have adaptive capacity to the impacts of climate change."

The government of Malawi developed the National Climate Change Management Policy 2017-2027, to assist the country achieve its long term goal for climate change management, which is to reduce the socio-economic impacts of adverse effects of climatic change. The NCCM policy is in line with other national strategies and plans. For example, the Malawi Growth Development Strategy II 2011-2016 recognizes that climate change, environment and natural resources management as key priority areas that needs to be responded to using appropriate approaches because it contributes to lower land quality, heightens extreme weather conditions (e.g. recurrent droughts, heavy rain falls and floods) which sometimes lead to emergency relief efforts that divert much needed finances from development projects, and has significant adverse consequences for agriculture, food security, poverty and vulnerability. The process of developing the MGDS III 2017-2022 considered all the international commitments that Malawi made which include the SDGs, African Union Agenda 2063, SADC RISDP, and other regional treaties. The government advocated for alignment of the SDG to all sector and institutional programming. This guaranteed that all development intervention from the cooperating partners are well aligned towards the SDG timely tracking and reporting of all the agreed indicators. On the other hand, Malawi is also committed to implement the Sendai Framework for Disaster Risk Reduction 2015-2030 as it strives to achieve various SDGs since Malawi is suffering the impacts of disasters both from climate change as well another natural causes. The commitment goes beyond the 2030 agenda as it is clear that resilience building is paramount importance if the development gains being achieved in all the national efforts should be sustained. Malawi is therefore well placed to enact and mainstream a NAP to operationalize its approach to adaptation to climate change and to monitor progress towards desired outcomes.

Approach and Methodologies

Guiding principles

In line with the principles established by the UNFCCC and also in line with Malawi's development goals, the guiding principles for the NAP process are as follows: developing sustainably; uplifting the poor and the vulnerable; respecting the critical role of gender; encouraging participation and ownership; incorporating traditional and Indigenous knowledge, and proceeding with financial accountability and integrity.

a. A country-driven approach. country-driven approaches inspire ownership and ensure that plans, programmes and activities are aligned with national priorities.

b. Sustainable development Sustainable development is defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987).

c. Uplifting the poor and the vulnerable Poor people in Malawi, who are also the majority, are the most affected by climate change impacts and have the least means of adapting to these impacts. Rural, urban and peri-urban poor people bear the brunt of climate-related disasters such as floods because their communities suffer from weak infrastructure. When drought and famine occur, the

poor can also cope because of low incomes and reliance on rain-fed agriculture. Malawi's NAP will, therefore, among other principles, be guided by pro-poor principles to ensure inclusiveness. The NAP will ensure that the poor and vulnerable, including women and children, are targeted and benefit from the planning and implementing climate change adaptation interventions. The main objective of this principle is poverty reduction. This principle is in line with Malawi's Vision 20/20 and SDG 1.

d. Gender and social inclusion, and particular consideration of marginalized groups such as women The NAP will ensure that Malawi's Gender Policy (2015) principles—gender parity, women's empowerment and upholding women's rights—guide the process. The process will include the youth who are already engaged through various climate change youth networks

e. Participation NAP Process and ownership This is a critical guiding principle for the NAP. It will allow full involvement of stakeholders and beneficiaries in the NAP activities, thereby enabling information sharing and minimizing efforts' duplication. Soliciting the views of stakeholders at each step of the NAP will ensure their ownership, which will positively affect the outcomes. There are many actors in the climate change adaptation field that are already carrying out various activities. These will now be engaged with the NAP process guided by the framework, which will result in increased focus in terms of planning and funding for adaptation activities. This is important because adaptation activities have long been underfunded at both the central and district level. Stakeholder participation is necessary for buy-in, ownership, involvement in, and support of planned activities.

f. Incorporating traditional and indigenous While scientific methods of weather forecasting have evolved in the last 100 years or so, rural communities the world over have traditionally relied on Indigenous forecasting methods. In Malawi, communities have used local Indigenous methods to predict good or bad years by using cloud observations (appearance), wind directions, stars, and the behaviour of animals, insects and plants. Indigenous local knowledge of weather forecasting is useful in decision making at the village level. The NAP process will encourage integrating Indigenous knowledge with the scientific knowledge of weather forecasting. The process requires that communities be engaged to identify knowledge integrated with science, which could then be further disseminated for use by scientists, practitioners and policy- makers.

g. Financial accountability and integrity Resources allocated to climate change adaptation programs can greatly increase over time if there is confidence that these resources will be spent prudently, be quickly accessed, and produce the intended results. This calls for good fiduciary governance of the resources. The National Climate Change Investment Plan and the National Climate Change Fund have stipulated how they will manage fiduciary risks in dealing with the financial resources. Financial integrity in the NAP process will be further assured by adhering to government operating procedures on financial management and procurement as contained in Malawi's Financial Management Act. Besides, the NAP budget will be tabled by the Minister of Finance to the National Assembly during the annual government budget presentation for approval. All NAP workplans will be presented to the National Technical Committee on Climate Change and the National Steering Committee on Climate Change for endorsement and approval. This will ensure accountability and transparency.

h. A multidisciplinary and complementary NAP approach, building upon relevant existing plans and programmes Multidisciplinary and complementary approaches are essential in the NAP approach because adaptation is itself multidisciplinary and cross-cutting. The country has mainstreamed climate change issues in its development plans because it has implications for employment creation and economic growth. Its impact on various economic sectors such as agriculture, health and nutrition, tourism, and natural resources has been well established.

i. Simplicity and flexibility of procedures based on the country's circumstances Simplicity is important where actions are planned in multidisciplinary and multi-institutional/multi-agency contexts coupled with strong involvement of the public and private sector, communities and individuals. Flexibility is important, as adjustments can be made to improve different aspects of implemented programmes.

j. Alignment with the GCF country programme. This alignment is important to improve access to funds such as the Green Climate Fund. Such alignment would include coherency with the national climate change policy and related strategies and plans, coherence with existing policies, the executing entity's capacity to deliver, and stakeholder consultations and engagement.

Guidelines used

The main guidelines used included:

· The Technical Guidelines for the National Adaptation Plan Process, UNFCCC – this was used as the primary document for framing of the structure and content of the NAP. It also requires that the NAP process: follows a country-driven, fully transparent, approach; is based on and guided by the best available science and, as appropriate, traditional and indigenous knowledge; and facilitates country-owned, country-driven action and not be prescriptive, nor result in the duplication of efforts undertaken in-country.

- Malawi National Climate Change Policy-2017-2027
- Malawi Second National Communication-2011
- Malawi Vision 2020
- The Malawi Growth Development Strategy 2017-2022
- Malawi Intended Nationally Determined Contribution
- National Adaptation Plan of Actions-2006
- Malawi NAP Stocktaking Report 2016
- National Climate Change Investment Plan (2013-2018)
- National Environment and Climate Change Management 2012-2016
- National Strategy for Sustainable Development
- Malawi Strategy on Climate Change Learning

In addition, and following the experiences gathered from the implementation of the NAPA process, the Technical Guidelines recommend:

- using locally defined criteria for ranking vulnerabilities and prioritizing project activities, which will build confidence and buy-in across all stakeholders;
- using available data and assessments as a basis for more comprehensive assessments; and

- engaging national experts, as this will also enhance the experience and capacity of the country.

These were supported with emerging new data from the published literature. The assessment of these documents together included:

a. Process of identification/stocktaking of desirable and available information

- i. Climate and socio-economic data and information
- ii. Current assessments: Exploring possibilities for further assessments
- iii. Policies, strategies, plans
- iv. Existing initiatives on adaptation

b. Resource mobilization for the process.

A systems approach to adaptation

Systems are complex, and each system interacts to various degrees with other related systems. Sectoral interventions have not been as successful as desired because they do not take into account the interactions of system components, including the fact that the mandate to manage some components of the system may lie in a different sector, and hence come under a different institutional mandate whose primary goal is not necessarily in tandem with those of another sector, and more often than not, there is very little synergy between sectoral programmes.

Urban areas, for example, are complex since many social, physical and economic systems meet and interact, with many of these extending well beyond its spatial boundaries, e.g. water and power supply systems, while other linkages may be transboundary. It is important, therefore, that National Adaptation Plans capture these systems and their interlinkages, scale and stakeholder diversity, so that appropriate and synergistic adaptation measures can be devised and implemented. Thus, the NAP process uses a systems approach which facilitates the integration of climate change adaptation, in a coherent manner, into relevant new and existing policies, programmes and activities, in particular development planning processes and strategies, within all relevant sectors and at different levels, as appropriate.

The framework to guide the assessment of vulnerabilities and risks included: - i. Conceptual framework of vulnerability and risk at various levels: national, system level, local level, etc. - ii. Boundary conditions for the assessment using the period 1971-2000 for baseline climate but also extended further back into time where data is available. - iii. Focus on key systems/sectors - iv. Synergy with SDGs, Sendai Framework for DRR, and other relevant regional and national frameworks.

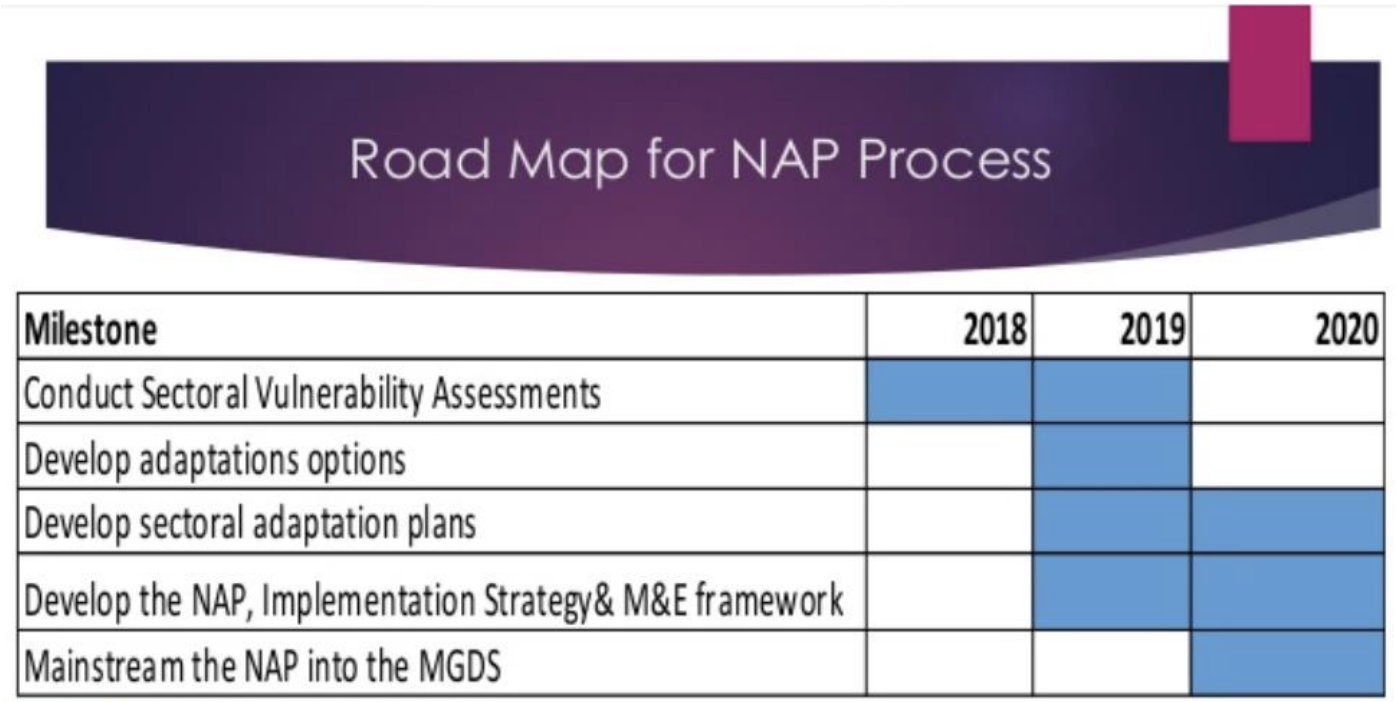
Other unique considerations

The emergence of the COVID-19 pandemic in early 2020 disrupted globally, established societal structures and ways of doing things, and has had devastating impacts on human health, stressed health systems and severely disrupted national economies. A UNDP 2020 study “Covid-19 Pandemic in Malawi Final Report June 2020” shows the high levels of vulnerabilities of individuals, households and the whole Malawian economy affecting negatively on almost all sectors of the economic growth in the country. The study projects that the negative impacts of COVID-19 on the economy are projected to persist for more than 10 years. The open NAP initiative in Malawi has been developed with Malawi being one of the 11 Africa-Asia-Pacific region beneficiaries of GCF funding of a mitigation-themed project named Climate Investor One. However, more funding of projects from other funding sources like LDCF, SCCF, GEF and Adaptation Fund among other sources has not been materialized perhaps due to lockdowns and poor internet access across the country affecting personnel availability to apply for funding as well as undertake the projects. It is however hoped that the situation will normalize and

that COVID-19 will be properly managed so as more funding will be availed to Malawi to continue developing this NAP and more funds can be used to develop the next NAP.

Road Map

This particular process was initiated in 2016 with a stakeholder engagement workshop (Figure XX). Milestones in the process are illustrated in Table XX below, with the goal of mainstreaming the NAP into the Malawi Growth and Development Strategy (MDGS III).



image

(Source)

National Context

National circumstances

Environment: Malawi's landscape has a varied topography and is dominated by the Great Rift Valley, which runs north to south and contains Lake Malawi and the Shire River Valley. To the west are the central plateaus, highlands (Nyika and Viphya in the north and Shire in the south) and isolated mountains (Mulanje and Zomba) (USAID, 2017a). In the mountainous sections of Malawi surrounding the Rift Valley, plateaus rise generally 800m to 1,200m above sea level, with some especially in the north rising as high as 3,000m. To the south of Lake Malawi lie the Shire Highlands, approximately 900m above sea level. The Shire River plays a very significant role in Malawi by providing water for generating hydropower (98% of Malawi's electricity), agriculture, fisheries, transport, tourism, urban and rural water supply along its length, impacting the livelihoods of over 5.5 million people in the southern region of Malawi (Masi, 2017). Freshwater for irrigation in Malawi's plantations such as Illovo Sugar at Nchalo is obtained from the Shire River; as well as other domestic and industrial uses (UNFCC, 2006). Malawi has multiple important waterbodies including Lake Malawi, (the third largest African Rift Valley Lake), Lakes Malombe, Lake Chilwa, and Lake Chiuta(USAID, 2015). Other rivers in Malawi providing water comprise of North and South Rukuru and Songwe in the Northern Region, Linthipe, Bua and Dwangwa in the Central Region, and Shire and Ruo in the Southern Region (Global Water Partnership, 2016).

In 2005, forest area coverage was at 24.3% while cultivated land covered 33.7%, shrubs and savanna woodlands covered 19.9% and the remaining 22.1% of Malawi was covered by water. In the upper Shire River catchment, there was an 18 % increase in agricultural land in the 1989 to 2002 period (Mtilatila et al. 2020). Forests and trees impacts livelihoods and the economy through the supply of biomass fuels, provision of habitats for wildlife and biodiversity, prevention of land degradation, protection of watersheds and acts as sources of soil fertility (Hughes et al. 2019). Malawi has the highest deforestation rate in sub-Saharan Africa with the government of Malawi estimating that the annual rate of deforestation in Malawi is 1.0–2.8%. Estimation shows that the ratio of forest area decreased from 51% to 33% from 1990 to 2010 (Mapulanga and Naito, 2019). Malawi has very low greenhouse gas (GHG) emissions of around 1.4 tons CO2 equivalents (CO2e) per capita in 2015 by global standards (Hughes et al. 2019). According to Malawi's Nationally Determined Contribution (NDC), the main sectors contributing to GHG emissions are as at 2015, forestry at 78% of the emissions, agriculture at 16% and energy at 4% (Irish Aid, 2018).

Soil degradation is a major challenge with soil losses averaged at 20 T/ha/year. This translate in a yield loss of 4% - 25% annually (Irish Aid 2019). In 2014, the average annual national soil loss rates were estimated at 29 tons per hectare, and soil erosion and nutrient depletion are reported to affect more than 60% of Malawi's land area. The main causes of this degradation are unsustainable farming practices, increasing demand for agricultural land and wood fuels associated with a growing population. Chemical land degradation, including soil pollution and salinization/ alkalization, has led to 15% loss in the arable land in Malawi in the last decade alone. The annual costs of land degradation between 2001 and 2009 have been estimated at USD 244 million per year-an amount equivalent to 6.8% of Malawi's country's GDP. Between 2008 and 2016, urban household demand for charcoal increased by 35% and was worth more than USD 66 million in 2016 and provided employment opportunities for over 235,000 people (Hughes et al. 2019).

Climate: The majority of the country experiences a cool tropical continental climate, characterized by two distinct seasons: a rainy season from November to April and a dry season from May to October. Annual rainfall ranges from 500 mm in low-lying areas such as the Shire Valley to above 3,000 mm in the northern highlands. Overall rainfall exhibits high inter-annual variability and is highly influenced by the El Niño Southern Oscillation (USAID, 2017a). The rains can start as early as October, especially in the south of the country and can end as late as May, especially in the north of the country (Malawi, 2015). The warm-wet season stretches from November to April, during which 95% of the annual precipitation takes place. Malawi experiences large heterogeneity in rainfall regime, and there are big differences between the North, Central and South regions. Annual average rainfall varies from 725mm to 2,500mm with Lilongwe having an average of 900mm, Blantyre 1,127mm, Mzuzu 1,289mm and Zomba 1,433mm (Masi, 2017). In the south of Malawi, the wet season normally lasts from November to February bringing around 150-300m per month, but rain continues into March and April in the north of the country as the ITCZ migrates northwards. Inter-annual variability in the wet-season rainfall in Malawi is also strongly influenced by Indian Ocean Sea Surface Temperatures, which can vary from one year to another due to variations in patterns of atmospheric and oceanic circulation. The most well documented cause of this variability is the El Nino Southern Oscillation (ENSO) (UNDP, n.d.).

Average daily temperatures vary with seasons and elevation, with the coldest temperatures (12–15°C) in July in the highlands and the hottest (25–26°C) in October in the Lower Shire Valley (USAID 2017a). Mean annual temperature has increased by 0.9°C between 1960 and 2006, an average rate of 0.21°C per decade (Irish Aid 2018). A cool, dry winter season runs from May to August with mean daytime temperatures varying between 17 and 27°C, and temperatures falling between 4 and 10°C at night. A hot, dry season lasts from September to October with daytime temperatures between 25 and 37°C. The wet season generally occurs between November and April and the dry season between May and October. Average temperatures range between 18° and 27°C, and the wet season can bring average monthly rainfall in the order of 150mm to 300mm (Masi, 2017; UNDP, n.d.). Between 1967 and 2003,

the country experienced six major droughts and incidences of flooding. 2011-12 droughts had severe effects on food security in many districts in Malawi, with approximately 2 million people affected, particularly in the southern districts. (Irish Aid, 2018). Floods in Malawi have been associated with heavy upstream rainfall resulting in too much water downstream that leads to the breaking-up of river banks. This is a common feature on the North Rukuru in Karonga, Likangala in Zomba, and the Ruo/Shire Rivers in Chikwawa/NsanjeMalawi has also experienced flush floods due to prolonged torrential rains, such as the Phalombe flush floods in 1991 that killed over 1,000 people, and wiped out villages, crops, livestock and property (UNFCC, 2006). Intensive flooding in 2015 left many lives and livelihoods destroyed (Irish Aid, 2018).

Political context: The Republic of Malawi is a sovereign State with rights and obligations under the Law of Nations (Malawi Constitution, Chapter one). There shall be a President of the Republic who shall be Head of State and Government and the Commander-in-Chief of the Defense Forces of Malawi (Article 78). The President shall be elected by a majority of the electorate through direct, universal and equal suffrage (Article 80(2)). The National Assembly of Malawi is the supreme legislative body of the nation. The National Assembly has 193 Members of Parliament (MPs) who are directly elected in single-member constituencies using the simple majority system and serve five-year terms. Malawi is a member of the United Nations, the Commonwealth of Nations, the Southern African Development Community (SADC) (Malawi 2017), the Common Market for Eastern and Southern Africa (COMESA), and the African Union (AU). Malawi was a one party state since attaining her independence until 1993 when it became a multi-party state (Masi, 2017).

Legislative context: The GoM prioritizes climate change, natural resources, and environmental management in its development strategy, the Malawi Growth and Development Strategy (MGDS II 2012–2016). The GoM has also invested in the Green Belt Initiative (GBI); an initiative which seeks to transform Malawi, through irrigation, from a predominantly consuming and importing country to a producing and exporting country (USAID, 2013). In 2016, Malawi made an ambitious 4.5 million hectares restoration pledge to the Bonn Challenge and the African Forest Landscape Restoration Initiative (AFR100) by 2030 estimated at a cost of approximately 279 billion MWK or approximately 62000 MWK per hectare (USAID,2017b). GoM in partnership with the World Bank and African Development Bank has formulated this Strategic Program for Climate Resilience (SPCR) under the Pilot Programme for Climate Resilience (PPCR) to act as a framework for addressing the challenges of climate change that impact on the national economy and community livelihoods. The SPCR will build on the available enabling frameworks and efforts in climate resilience-building programs as stipulated in the Malawi Growth and Development Strategy III, National Climate Change Management Policy (2016), National Agriculture Policy (2016), National Climate Change Investment Plan (2013), and Malawi's Nationally Determined Contribution under the UNFCCC (2015).

Malawi is a signatory to various international treaties, instruments and that cover climate change. These include the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. These treaties and instruments oblige the country to take various actions to address climate challenges including putting in place instruments such as climate change policies and legislation. Malawi is a member of the Least Developed Countries' (LDCs) Group, the LDC Expert Group (LEG), and currently has a seat on the board of the Adaptation Committee and the Green Climate Fund (GCF) Board (Masi, 2017). The Government has put in place a series of legislative sectoral frameworks and strategies to integrate environment and climate change management in socio-economic development activities. Key ones include: Vision 2020; the Malawi Growth and Development Strategies; National Environmental Policy (NEP) 2004; NAPA 2007; National Climate Change Investment Plan (2013); Malawi Energy Policy (2003); Food Security Policy (2006); Disaster Preparedness and Relief Act (DPRA) (1991); Environment Management Act (1996) and the Disaster Risk Management Policy 2015 (Irish Aid, 2018).

Social context: According to the World Population review, January 2018, Malawi has a land area of 118,484 square kilometers, with an estimated population of 18,921,352 million which ranks 61st in the world. Malawi still has a fairly low population density of 129 people per square kilometer (86th in the world). However, Malawi is growing rapidly with a 3.06% (Masi, 2017) annual growth rate. High incidences of poverty, violence, unemployment, malnutrition, HIV and AIDS, high illiteracy rates, abuse, poor health, and psychological disorders characterize the country's young population (MDGS II 2011-2016) (Irish Aid, 2018). About 85% of the people live in rural areas and derive their livelihoods from natural resources and agriculture (from small land holdings of between 1.0 and 5.0 ha per household of five people), with the remaining 15% residing in urban areas. About 48% of the population is below 15 years of age. The overall average life expectancy as of 2008 statistics was 37 years with fertility rates declining from 7.6 in 1984 to 2.8% in 2008 and later rising to 6.7 (Malawi Vision 2020). There has been migration from rural to urban areas (at the rate of 3.6% per year), and from densely populated to sparsely populated areas or districts over the decades from areas adversely affected by climatic hazards (especially floods and drought) to safer upland areas or other districts (Ministry of Environment and Climate Change Management Environmental Affairs Department, 2018) and in search of income earning opportunities (Malawi Vision 2020). 33150 cases and 981 deaths were recorded in Malawi's worst Cholera outbreak. Waterborne infectious diseases are a leading cause of child mortality and contribute to forms of growth retardation, including stunting and wasting with 48 to 53 percent of children under the age of five suffering from stunted growth (Republic of Malawi, 2012). Overall, records as to disaster damage provided by Department of Disaster Management Affairs, DoDMA and the Prevention Web (by The United Nations Office for Disaster Risk Reduction, UNISDR) give critical information related to human and economic losses resulting from the disasters that have occurred in Malawi within last three decades. More than 47 natural disasters were recorded in the last three decades and these disasters range from droughts, earthquakes, epidemics, floods and storms. In these natural disasters, a total of 2,775 people were killed with an average of 90 people killed per year. Most of these (60%) died due to epidemics (National Water Resources Masterplan- Part II masterplan). Malaria is the most common disease in the lake areas, followed by respiratory infections, diarrhea, anemia, and bilharzia/schistosomiasis. HIV/AIDS and other sexually transmitted infections (STIs) are also common. Research conducted by Madsen et al. between 1998 and 2007 found a high prevalence of schistosomiasis.

Vision, Goals and Objectives of the NAP

Vision for Adaptation for the Country

The vision is "a country that is resilient to adverse socio-economic impacts of climatic change".

Goals and Objectives of the NAP

The main goal and objectives of the Malawi NAP, in line with the country's National Climate Change Management Policy, are:

Goal - create an enabling policy and legal framework for a pragmatic, coordinated and harmonized approach to climate change management

Objectives

- Effectively manage the impacts of climate change through interventions that build and sustain the social and ecological resilience of all Malawians;

- Integrate climate change into planning, development, coordination and monitoring of key relevant sectors in a gender sensitive manner; and

- Integrate cross-cutting issues into climate change management through an appropriate institutional framework

Climate Change Adaptation Assessment

xxx

National Adaptation Priorities

xxxx xxxx

Implementation Strategy for the NAP

xxx

Alignment with the GCF Country Programme

xxx

Mobilization of other Sources of Finance

xxx

Monitoring and evaluation of adaptation actions and process

xxx

Reporting

xxx

Further development of the programme to support future NAPs

xxx

Annex I: NAP Outputs

xxx

Annex 2: Country Profile

xxxx

Annex 3: Data and information system to support the NAP

xxx

References