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MOZAMBIQUE

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List of Abbreviations

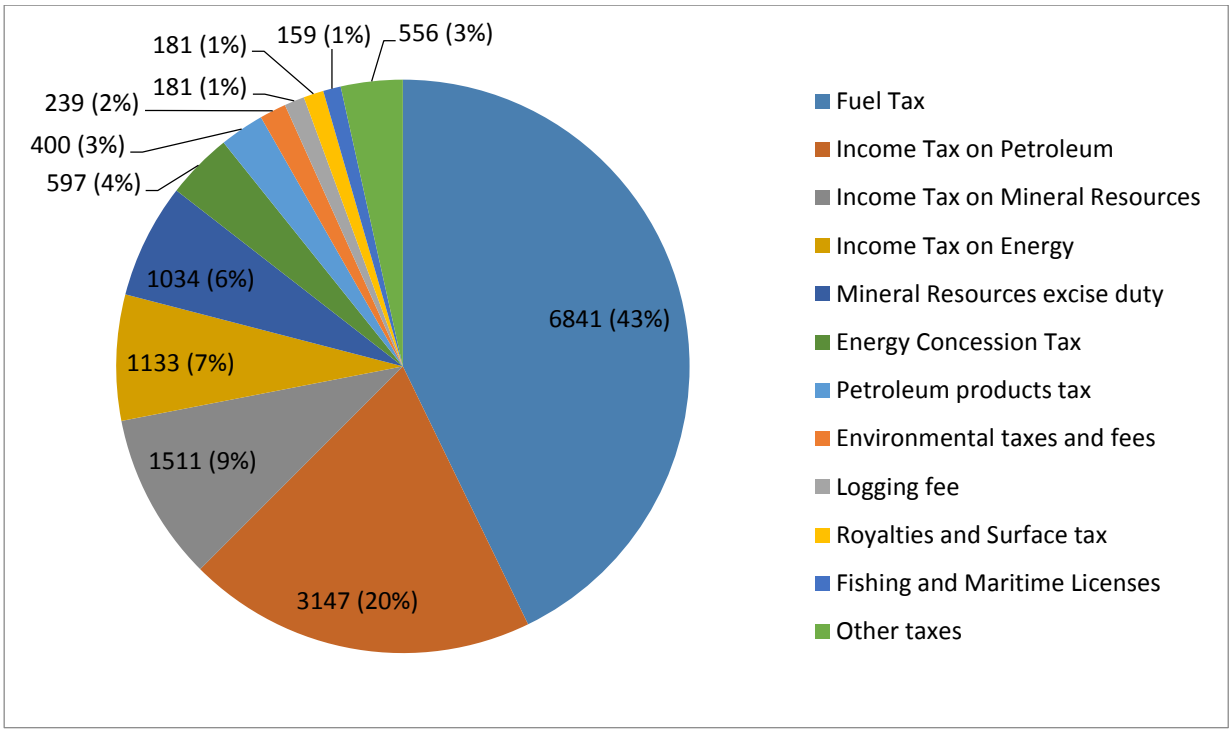
ADB	African Development Bank
AIAS	Administration of Water Supply and Sanitation Infrastructure
ANAC	National Agency for Conservation Areas
AQUA	National Agency for Environmental Quality Control
ARA	Regional Water Administrations
CDS	Centre for Sustainable Development
CIP	Centre for Public Integrity
CRA	Water Regulatory Council
CSOs	civil society organizations
EDM	Electricidade de Moçambique
ETS	Emissions Trading System
EU	European Union
FDI	Foreign Direct Investment
FIPAG	Water Supply Investment and Asset Fund
FSC	Forest Stewardship Council
FCPF	Forest Carbon Partnership Facility
FUNAB	Environmental Fund
FUNAE	Mozambique Energy Fund
GBS	General Budget Support
GDP	gross domestic product
GFR	Green Fiscal Reform
GHG	greenhouse gas
GWh	gigawatt hours
GOM	Government of Mozambique
IFC	International Finance Corporation
IMF	International Monetary Fund
IMPFA	Intermediate Institute for Physical Planning and Environment
IOTC	Indian Ocean Tuna Commission
IWRM	Integrated Water Resource Management
LNG	liquefied natural gas
LPG	liquefied petroleum gas
MICOA	Ministry for the Coordination of Environmental Action
MOPH	Ministry of Public Works and Housing
MW	megawatt
MWh	megawatt hours
MZN	Mozambican metical
PARPA	Action Plan for Reducing Absolute Poverty
PARP	Poverty Reduction Strategy
PV	photovoltaic
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SADC	Southern African Development Community
SWIOFC	South West Indian Ocean Fisheries Commission
UGBs	Watershed Management Units
US$	United States dollars
VAT	Value-added taxes

Executive Summary

Mozambique faces a range of environmental challenges and risks which could all be compounded by climate change and a growing population. These challenges and risks include: deforestation; declining fish stocks; land, water and air pollution; and loss and degradation in wetlands and rivers. At the United Nations (UN) Conference on Sustainable Development in 2012 in Rio de Janeiro (Brazil), Mozambique pledged that it would work towards the creation of a green economy, with the vision of becoming "an inclusive middle-income country by 2030, based on protection, restoration and rational use of natural capital and its ecosystem services to guarantee development that is sustainable, inclusive and efficient, within the planetary limits" (GOM, 2012b). Mozambique is still in the early stages of its green economy transformation, with a national roadmap and action plan released in 2012 and 2013, respectively.

At the operational level, governments can create the enabling conditions for a green economy transformation through investments, fiscal policies and regulations. The focus of this report is to identify policy options for Green Fiscal Reform (GFR) in Mozambique. These policy options include the use of taxation and pricing measures which raise revenues or lower expenditures, while furthering environmental goals by addressing environmental externalities and incentivizing green investment.
Mozambique already has a fairly well-developed system of taxes and fees that achieve environmental objectives and help foster shifts in behaviour and investment decisions. Together, these taxes and charges generated MZN 16 billion (US$ 470 million) of revenue in 2014, or 12.6 per cent of total tax revenue. Figure ES-1 provides an overview of the respective contributions of various GFR-relevant taxes and charges to tax revenues in 2014. As can be seen in this figure, fuel taxes are a major revenue generator, as are income taxes in the extractive sectors, environmental fees and taxes which include inter alia logging fees, royalties and surfaces taxes.

Figure ES-1: Overview of revenues from environment-relevant taxes and charges in 2014, MZN millions and percentage share of total



Source: GOM, 2014c; GOM, 2014f

In addition to these policies, a range of viable GFR policy options that the government could consider were identified through research on the government's environmental challenges and fiscal policy landscape, a national validation workshop, as well as a literature review and expert consultations on global best practices. These policy options could facilitate Mozambique's green economy transformation by shifting behaviour and investment decisions, while concurrently helping to create fiscal space that could be used to promote social and green economy investments.

Mozambique's environmental challenges and GFR policy options are summarized in Table ES-1. Some notable or cross-cutting policy options include:

- **Developing more fiscally advantageous terms with companies operating in the extractive sectors**. This would involve negotiating better royalty rates in contracts and concession agreements, reducing or eliminating the direct and indirect subsidies offered to foreign companies, and potentially charging for the carbon emissions and land, water and air pollution arising from coal, oil, natural gas, and mineral resource production. These actions would help ensure that extractive operations are of net economic benefit to the country since the value proposition they ultimately represent has often been unclear in the past due to the various tax exemptions that have been extended. Such policies could also help the government recoup some of the environmental costs associated with the sector's activities, and incentivize producers to invest in production techniques that minimize environmental impacts.

- **Increasing taxes on the most polluting fuels and less efficient vehicles**. Mozambique already has a robust system of fuel and vehicle taxes, however there remains scope to further increase tax rates on the most polluting fuels and less efficient vehicles relative to cleaner alternatives. This is important given the expected growth in the country's population and related increase in demand for transport services in the coming years. Such measures can help to incentivize investment in renewable energy technologies and shift behaviour and investment decisions in the transport sector to be more in line with green economy principles.

- **Ensure that charges for the use of natural resources or ecosystem services reflect their economic value and environmental externalities.** Charges for abstraction of water, wastewater discharge and treatment, fishing and forestry licences could be reviewed to reflect associated capital and operational costs and environmental externalities, such as declining fish stocks and water resources and damaged ecosystem services. By valuing these resources and ecosystem services in a way that reflects these costs, present unsustainable rates of extraction could be curbed and resources managed more effectively for the long term.

- **Improve monitoring and enforcement efforts and move to control corruption**. There is inadequate capacity for monitoring and enforcement in the mineral resource, water, fisheries and forestry sectors. In many cases improving enforcement of existing regulations and charges is more important than adopting new measures. Better enforcement would help to ensure conformity with licence terms and enhance knowledge of activities in different sectors and environmental impacts. The associated costs of such efforts would be offset by increased revenue from penalties and from the formalization of informal parts of the sectors. At the same time, urgent measures should be taken to fight and control corruption in the exploitation of natural resources around the country (particularly timber and minerals).

Table ES-1: Environmental challenges and GFR policy options in Mozambique

Sector	Environmental challenges	GFR policy options
Energy	• Land, water and air pollution from oil and gas extraction • Clearing of virgin forests, degradation of soils • Variable rainfall as the result of climate change, raising the risks of lower hydroelectricity generation	• Put a price on the carbon emissions and pollution associated with the production of coal, oil and natural gas. This could initially be based on the carbon content of fuels before moving to a more broad-based carbon tax • Remove price support for small-scale diesel generators
Mineral Resources	• Chemical pollution, erosion and siltation, particularly from artisanal mines • Ongoing environmental pollution from unrestored abandoned sites	• Develop better contract and licence terms with foreign companies • Reduce or eliminate the numerous tax rebates for megaprojects • Consider raising the surfaces tax to compensate for the loss of arable land • Have companies make a cash deposit before receiving operating licences • Improve monitoring and enforcement
Transport	• GHG emissions • Air pollution	• Increase taxes on the most polluting fuels • Increase taxes on larger vehicles and less efficient engines • Full phase-out of fuel subsidies • Phase-out of older vehicles • Consider congestion charges (long-term option)
Water	• Loss and degradation of wetlands and rivers • Increases in the frequency of extreme events such as floods, droughts and cyclones due to climate change	• Introduce charges on certain industrial companies that do not currently pay for water • Collect fees for effluent discharge • Improve monitoring and enforcement
Fisheries	• Overfishing • Marine habitat degradation • Pollution and natural disasters • Challenges exacerbated by impacts of climate change	• Review fishing licence fees, including fees for foreign vessels compared to domestic vessels • Improve monitoring and enforcement • Consider raising penalties for infringements
Forestry	• Mangrove, coastal forest and woodland deforestation • Uncontrolled fires • Clearing of virgin forests	• Combat corruption • Increase monitoring and enforcement capacity in the forestry sector. • Consider raising penalties for infringements • Charge the agriculture and extractive sectors for clearing of land • Scale up forestry licence costs

Overall, Mozambique has a robust system of environmental taxes and levies and a well-articulated green economy strategy. Leveraging some further GFR policy options and improving monitoring and evaluation frameworks, could contribute towards the realization of Mozambique's green economy goals as well as strengthening the government's fiscal position.

1. Introduction

The global environmental, climate, fiscal and financial crises of recent decades have made clear how current production and consumption modes are inadequate to ensure the well-being of a growing population in the face of tightening environmental and natural resources constraints. In this context, the transformation towards a green economy is a necessary condition to reverse the trends of environmental degradation and widespread poverty, and achieve sustainable development outcomes.

At the visionary level, UNEP (2011) considers the green economy as "an economy that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities." At the operational level, governments can create the enabling conditions for a green economy transformation through investments, fiscal policies and regulations that aim to: (a) reduce carbon emissions and pollution; (b) enhance energy and resource efficiency; and (c) prevent the loss of biodiversity and ecosystem services (UNEP, 2011).

The UNEP Green Economy Report affirms that "transitioning to a green economy has sound economic and social justifications and there is a strong case emerging for a redoubling of efforts by both governments, as well as the private sector to engage in such an economic transformation." In the short term (2015-2020), investments in green economy initiatives are expected to deliver similar annual growth in GDP per capita (roughly 2 per cent), as compared to investments in an economic model that favours more conventional use of resources and fossil fuels. However, from 2030 onwards, UNEP estimates that funnelling 2 per cent of global GDP per annum in a green economy, rather than following a business-as-usual scenario in resource allocation, could mean a higher annual GDP per capita growth of approximately 30 per cent by 2050. For the private sector, UNEP estimates that by 2050 investors will receive a higher yield on their green economy investment by a ratio of at least three to one. These findings make a strong economic case in favour of embracing a green economy (UNEP et al., 2011). Furthermore, green economy policies and investments can make a valuable contribution to enhanced economic diversification, inclusive growth and poverty reduction in developing countries (UNEP et al., 2011). A green economy could also help countries in achieving the Sustainable Development Goals (SDGs), by favouring investments in sustainable and climate-resilient infrastructures.

Among the various policy interventions that can support the green economy transformation, fiscal policies are perhaps the most powerful instruments that can be used to promote green economic activity. Indeed, fiscal policy plays a critical role in a green economy. (UNEP, 2012). In general, fiscal policies are focused on the most fundamental functions of government, namely: (a) how / where revenue is raised from taxpayers and where it is not (taxation policies); and (b) how revenue is spent to support businesses and households (spending and subsidy policies). As UNEP (2012) notes: "The means by which tax revenues are generated has a fundamental effect on the structure of incentives facing businesses and households, in both consumption and investment decisions. Secondly, how government spends these revenues not only on recurrent costs, but also investments in public infrastructure or supporting technology development, plays a critical role in shaping the path of economic development." Green Fiscal Reform (GFR) involves taxation and pricing measures which can raise revenues while furthering environmental goals. In particular, GFR has a dual function: (a) to create fiscal space, namely budgetary room that allows a government to mobilize additional resources to finance a green economy without any prejudice to the sustainability of its financial position (Heller, 2005); and (b) to drive consumer behaviour and investment by affecting prices. In the context of a green economy transformation, a fiscal space assessment identifies the possibility to alter government revenues and expenditures through GFR, and the ability to redirect expenditure or alter revenues so as to enable the implementation of measures related to the green economy (Roy & Heuty, 2009; World Bank, 2005).

This report analyses the environmental challenges and current fiscal policies in Mozambique with the aim of identifying possible GFR options that could address environmental challenges while increasing fiscal efficiency and human well-being. The report begins with some relevant country background, including an overview of economic, social and environmental trends, and the status of green economy initiatives in the country. Section 3 gives an overview of the current fiscal status, providing detail on

government expenditures and revenues. Section 4 describes the current policy context for supporting the green economy transformation in Mozambique, and builds on the previous analysis to offer policy options that could be implemented in key sectors. Finally, section 5 provides a conclusion of the key outcomes of this study.

2. Country background

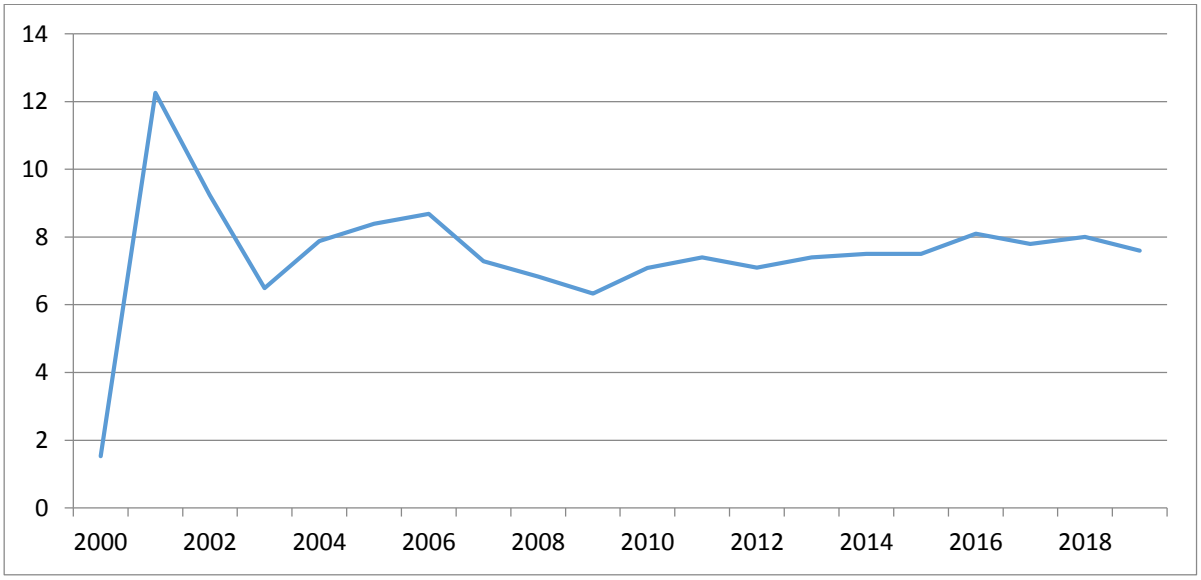
2.1 Socioeconomic context

As of 2014, the population of Mozambique was about 25 million, with an estimated growth rate of 2.6 per cent per year (GOM, 2014a). Mozambique's population is largely rural, with only 31 per cent of the population living in an urban area (World Bank, 2014). Moreover, the urban population is found primarily in the south of the country, whereas the population living in the north is more spatially dispersed (Dominguez-Torres & Briceno-Garmendia, 2011).

Beginning in 1964, Mozambique experienced a violent civil conflict that lasted nearly 30 years. The prolonged conflict resulted in massive social, political and economic disruption that continues to affect the country to this day. Following the end of the civil war in 1992 the has maintained an annual GDP growth rate of almost 8 per cent and is expected to sustain this level into the future as a result of substantial increases in foreign direct investment (FDI) (GOM, 2012a). Figure 1 shows historical and predicted GDP growth rates for Mozambique to 2015.

Economic growth has largely been driven by the services, light industry and agricultural sectors (Dominguez-Torres & Briceno-Garmendia, 2011). In addition, increasing infrastructure investment has resulted in some well-developed infrastructure, including an east-west transportation network, power grid and water and sanitation networks (Dominguez-Torres & Briceno-Garmendia, 2011). However, economic growth has not had a significant impact on the quality of life of Mozambicans. Mozambique continues to be classified as a least developed country, adult life expectancy is only 49.5 years and the country is ranked 185th on the Human Development Index (Bertelsmann Stiftung, 2014).

Figure 1: GDP growth rate (%)



**Years 2014 to 2019 are projections*
Source: International Monetary Fund, 2015c

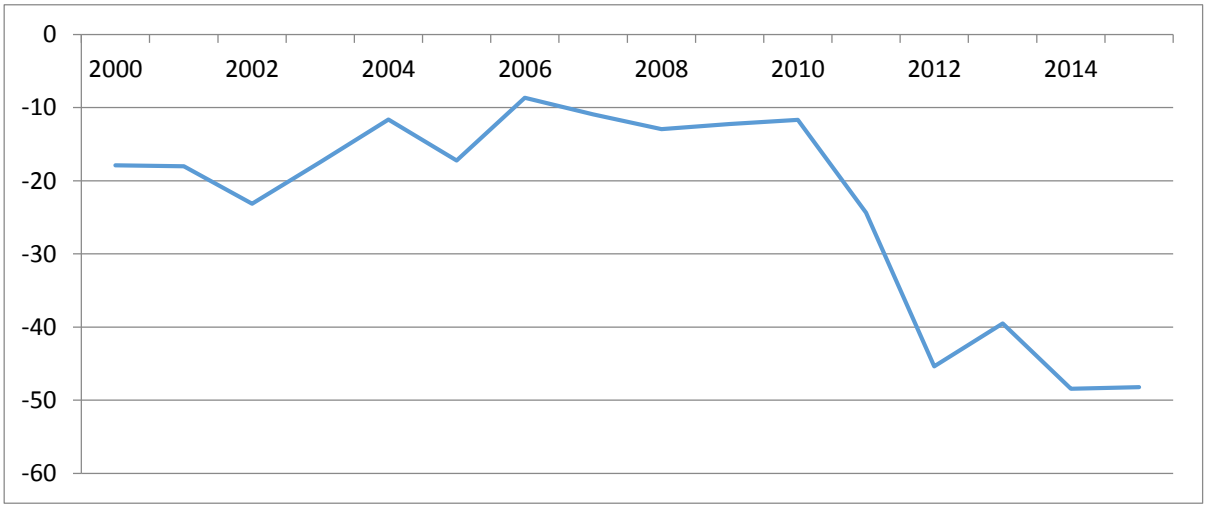
Mozambique faces a number of challenges in terms of utilizing the profits from economic growth to facilitate socioeconomic development. The country is highly dependent on natural resources and has struggled to diversify its economy – natural resource exports represent more than 66 per cent of total

exports, followed by raw agricultural products (Almeida-Santos, Monge Roffarello & Filipe, 2014). The country's exports mostly consist of aluminium, coke, natural gas, bulk electricity and tobacco products (World Integrated Trade Solution, 2015). Moreover, the Mozambican economy has not benefitted from optimal utilization of its abundant natural capital. In the natural resources sector, development is concentrated in a select few megaprojects, specifically in coal, gas and aluminium (Almeida-Santos, Monge Roffarello & Filipe, 2014).

Between 2012 and 2014, FDI inflows have averaged approximately MZN 170 million (US$ 5 million) with coal and natural gas sub-sectors as the main investment targets, and South Africa (18 per cent), United Arab Emirates (17 per cent) and the United States (11 per cent) as the main investment partners[1] (IEA, 2014). Substantially higher FDI inflows resulting from investment in megaprojects have had little impact on government revenues or on employment levels. This can be attributed to weak human capital, the high cost of credit, deficient infrastructure and burdensome regulations (Almeida-Santos, Monge Roffarello & Filipe, 2014), which have all limited the potential for capital inflows to facilitate economic development and diversification. These FDI flows are projected to climb from approximately MZN 170 million (US$ 5 million) in 2015 to MZN 270 million (US$ 8 million) in 2019 (IMF, 2015a).

Despite some positive factors, Mozambique's economic growth has experienced drawbacks. As can be seen in Figure 2, the country's current account balance has been negative since 2000 as the expansion of economic activity, particularly those areas of activity related to megaprojects, has resulted in a demand for higher imports. Furthermore, the current account balance has significantly worsened since 2010, and is expected to reach -48 per cent of GDP in 2015 and -57 per cent of GDP by 2019 (IEA, 2014). Nevertheless, projections for the country's overall economy remain favourable, particularly as discoveries of large natural gas deposits in recent years have the potential to propel Mozambique's economic growth and development even further (Gqada, 2013), but only if accompanied by increasing revenues and profit sharing. If this is not achieved, economic growth will not have potential positive impacts on Mozambique's economy and population. The IMF predicts that the economy will grow from MZN 595 billion (US$ 17.6 billion) in 2015 to MZN 1,002 billion (US$ 30 billion) in 2019 (IEA, 2014).

Figure 2: Current account balance (% of GDP)



**Years 2014 and 2015 are projections*
Source: International Monetary Fund 2015c

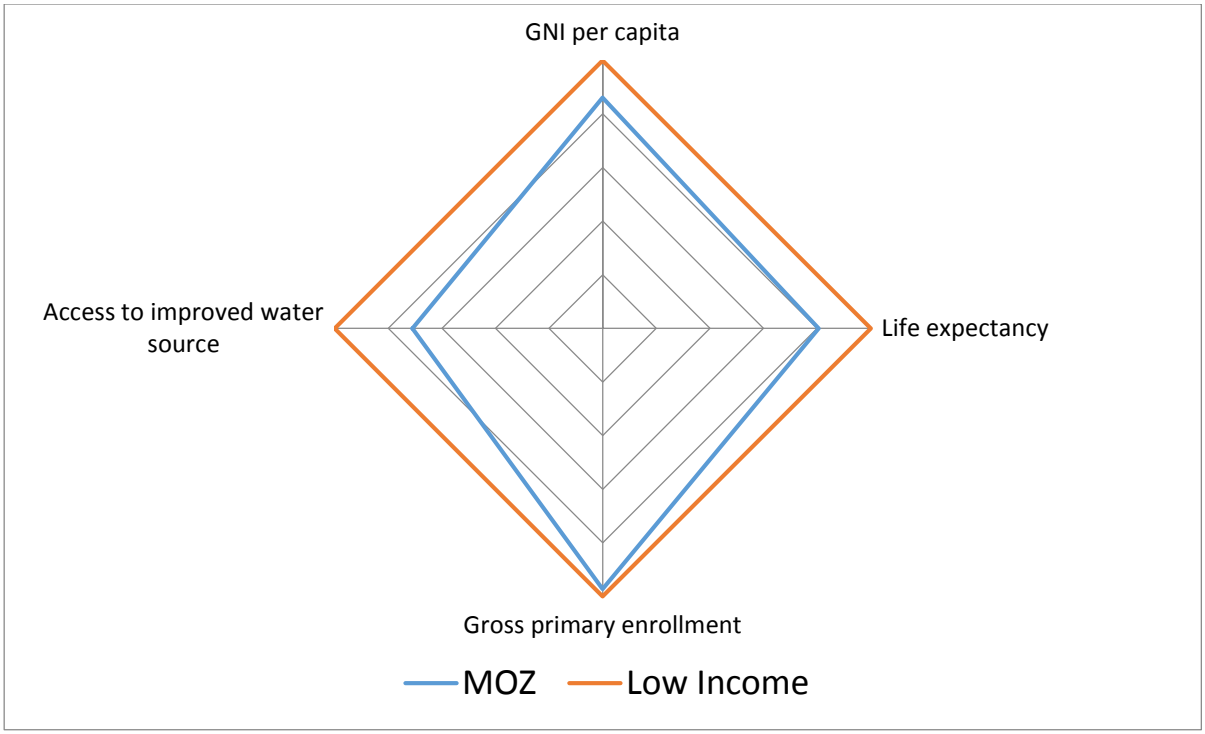
Employment and job creation are major issues in Mozambique. Strong economic growth and the high volume of FDI inflows have led to only limited job creation in the country (Almeida-Santos, Monge Roffarello & Filipe, 2014). Unemployment has remained at 7.5 per cent since 2010 but the official unemployment rate only tells part of the story as Mozambique has a large informal employment sector

[1] Provided percentages are from 2012.

and the formal economy accounts for only 32 per cent of total employment (Bertelsmann Stiftung, 2014). With high population growth rates, an increasing number of people, particularly the youth, are turning to the informal sector to find temporary, marginal jobs (Bertelsmann Stiftung, 2014). Such employment is unlikely to contribute to raising living standards in Mozambique. Labour market difficulties in the country are exacerbated by a high population growth rate of 2.6 per cent and a high labour force growth rate of 2.3 per cent (World Bank, 2014). Employment levels have not improved in line with the positive rate of economic growth, leading the government to designate employment as one of the government's top policy challenges.

Mozambique also faces high rates of poverty (Almeida-Santos, Monge Roffarello & Filipe, 2014), suggesting that the benefits from substantial economic growth have not been distributed equally. Beginning in 1987, a number of poverty reduction reforms were implemented to encourage economic growth with the hope that such growth would simultaneously reduce poverty in the country (World Bank, 2011). Figure 3 below illustrates that Mozambique ranks marginally better than other low-income countries on some human development indicators. However, despite some initial progress after 1987, poverty reduction has essentially stagnated since 2005 (GOM, 2012a), and recent data shows that more than half (55 per cent) of the country's population lives on less than 1 USD/day (World Bank, 2014).

Figure 3: Comparison of human development indicators



Source: World Bank, 2014

2.2 Green economy initiatives

In recent years, the Government of Mozambique has taken a number of steps to establish a solid policy and regulatory foundation for sustainable development and the green economy transformation. At the UN Conference on Sustainable Development held in Rio de Janeiro (Brazil) in 2012, Mozambique committed to working towards a green economy, with the vision to become "an inclusive middle-income country by 2030, based on protection, restoration and rational use of natural capital and its ecosystem services to guarantee development that is sustainable, inclusive and efficient, within the planetary limits." (GOM, 2012b). It has taken on a leadership role in Africa on the issue, and is one of the first countries on the continent to explicitly state that it wishes to pursue such policy goals (GOM, 2012a). At the national level, an institutional infrastructure exists to support the government's green economy

and sustainable development ambitions (GOM, 2012b).[2] Some key policies have also been developed and adopted over recent years to promote sustainable development, namely the Environmental Strategy for Sustainable Development in Mozambique (2007), the National Development Strategy (2015-2035), and the National Strategy for Climate Change Adaptation and Mitigation (2012) (GOM, 2012a; GOM, 2012b). The National Strategy for Climate Change Adaptation and Mitigation explicitly identifies the pursuit of "low carbon development and a green economy" as one of its goals (GOM, 2012a).

Mozambique's heavy dependence on natural resources has spurred the advancement of a substantial body of legislation aimed at promoting the rational and sustainable use of natural resources. A major pillar of the National Development Strategy (2015-2035) is "the fundamental role of sustainable management of natural resources for economic development to benefit present and future generations" (GOM, 2012a). However, the government's approach to sustainable natural resource use goes beyond high-level strategic direction setting. The various policies and regulations focused on sustainable natural resource use point to a broad understanding of the factors that contribute to sustainable natural resource use and sustainable development.[3] Examples of this include the government's Gender Strategy and its Science, Technology and Innovation Strategy (GOM, 2012a). However, while the government has most certainly engaged in policy formulation and adoption, little information is available on how these policies have been implemented and enforced to date.

Mozambique is still in the early stages of transforming its economy to a green economy, with a national Roadmap and Action Plan released only in 2012 and 2013, respectively. Nevertheless, concrete first steps have recently been taken. The Green Economy Action Plan envisioned 2012-2014 as the key transition years to lay the foundations for incorporating green economy principles into national planning and development processes (GOM, 2012a). It is expected that the outcomes of the Green Economy Action Plan will feed into the upcoming five-year national planning document for 2015-2019 (GOM, 2012a). Concrete goals laid out for 2012-2014 are outlined below, and a more extensive schedule of activities is provided in Annex 3.

- Mapping, valuation and planning of natural capital;
- Technical and institutional capacity building to implement the green economy approach, including integrating it to the planning processes;
- Identification of sector policies that could contribute to the green economy and implementation priorities (GOM, 2012a)

Five key institutions (in addition to those mentioned in footnote 4) will be crucial during the country's green economy transformation, namely: the Ministry for Planning and Development; the Ministry of Finance; the Ministry for Coordination of Environmental Action; the Ministry of Foreign Affairs and Cooperation; and the National Council for Sustainable Development (GOM, 2012a). Interdepartmental cooperation and coordination will be needed to integrate green economy principles in an effective, cross-sectoral manner. However, the potential for transformational change may be constrained if the transformation to a green economy is seen solely through the lens of natural resource management. The government seems to have realized this possibility and has proposed a Multi-Sectoral Platform for a Green Economy; one objective of this multi-sectoral platform is to build indicators to define the monetary and non-monetary values of the principal ecosystem services (i.e. to go beyond what is traditionally measured and accounted) (GOM, 2012b), and which utilizes interdepartmental cooperation between the five key institutions mentioned above. However, changes in monitoring and enforcement approaches are urgently needed to optimize the chances of success. One criteria for success is that these changes should be designed to ensure that the green economy agenda is implemented in a timely fashion, involves tangible changes to the economy and tries to ensure the well-being of Mozambicans.

[2] These institutions include: the Ministry for the Coordination of Environmental Action (MICOA); the three Centers for Sustainable Development (CDS) for coastal areas, urban areas and natural resources; the Environmental Fund (FUNAB); the Centre for Research on the Marine and Coastal Environment; the National Agency for Conservation Areas (ANAC); the Intermediate Institute for Physical Planning and Environment (IMPFA); and the National Agency for Environmental Quality Control (AQUA).

[3] See Annex 2 for a comprehensive list of relevant policies and strategies.

3. Fiscal policy overview

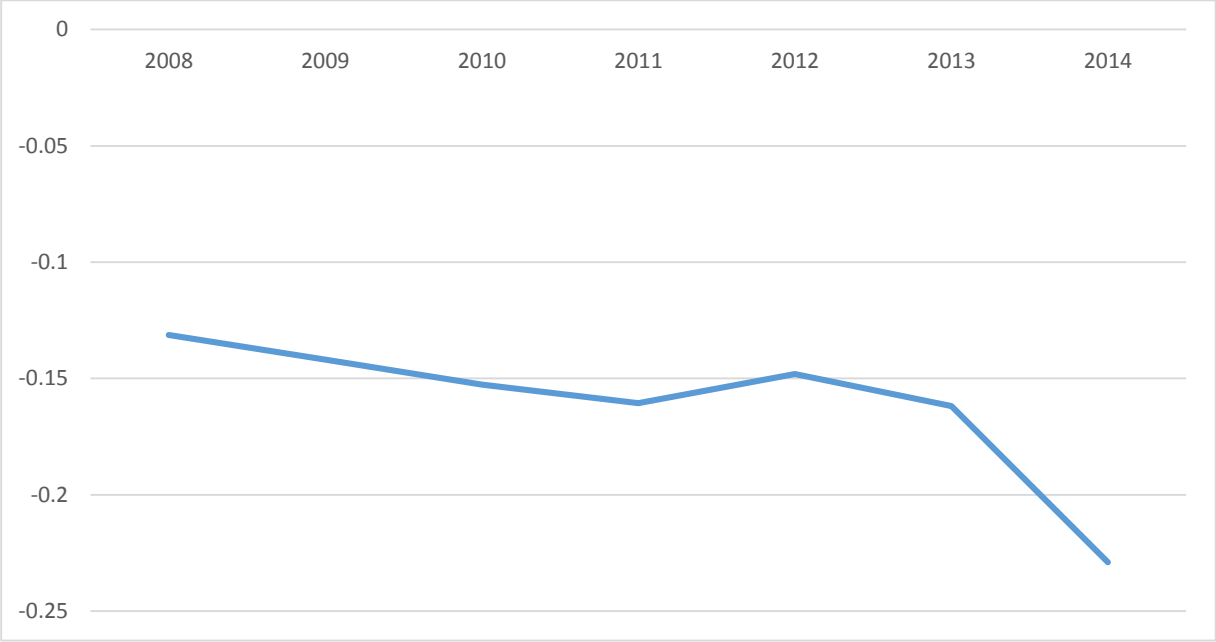
This section gives an overview of the current fiscal status in Mozambique, including an analysis of recent trends in public revenue and expenditure management. Firstly, the overall fiscal status of Mozambique is briefly analysed, including an analysis of the country's deficit, debt and inflation trends. This is followed by an analysis of recent revenue trends and taxation policies adopted in the country. Finally, public expenditure is analysed, including current environment-related expenditure.

The objective of this section is to facilitate the identification of potential opportunities for green fiscal policy reforms that could enable a green economy transformation in Mozambique. In particular, specific attention is paid to environmentally related taxes, as well as existing capital investments and fiscal incentives/disincentives that could influence the development of green sectors.

3.1 Fiscal status

Mozambique has carried a persistent deficit of between 10 and 25 per cent of GDP for over a decade (World Bank, 2014). In an attempt to encourage economic growth and implement the Poverty Reduction Strategy (PARP), the government has in recent years adopted an expansionary fiscal stance, which it has tried to offset by expanding its revenue base through enhancing tax collection (Bertelsmann Stiftung, 2014). However, its expansionary stance, poverty reduction policies and infrastructure investment have significantly added to the deficit in recent years, which came in at 23 per cent of GDP in 2014, as seen in Figure 4.

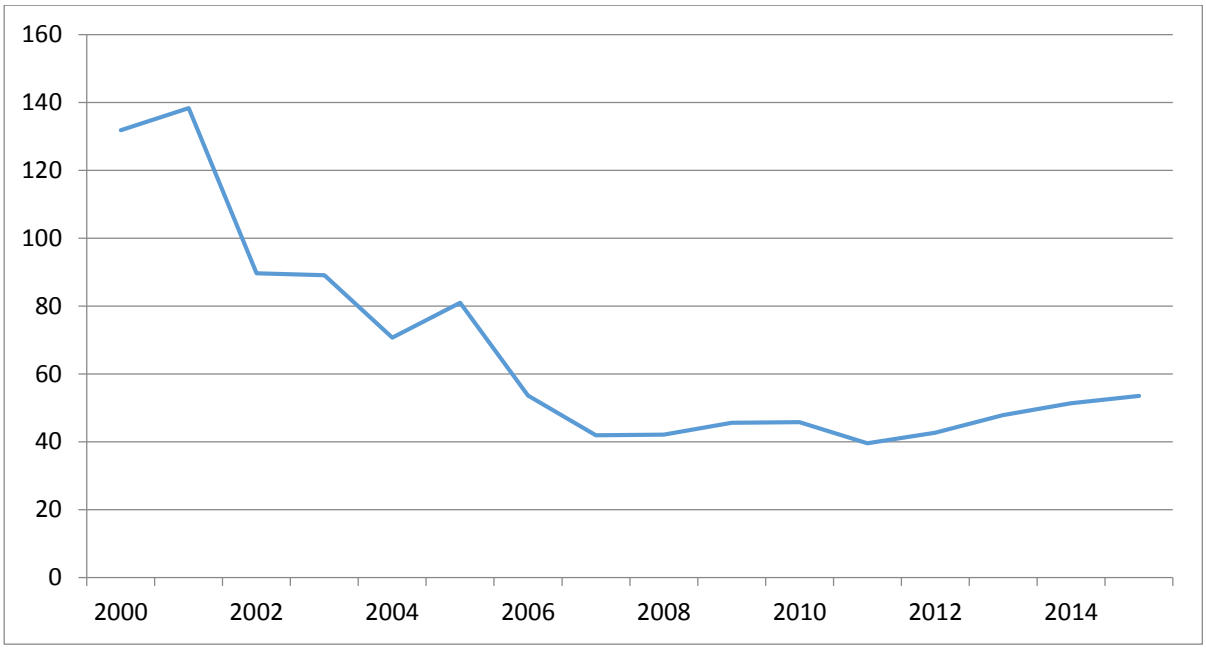
Figure 4: Fiscal balance (% of GDP)



**Years 2008-2013 are drawn from the national accounts and 2014 from projections found in Mozambique's 2014 national budget*
Source: GOM, 2014c; GOM, 2014f

In order to facilitate this increased fiscal spending, Mozambique has had to increase government borrowing, and while the rise of Mozambique's budget deficit is a source of concern, debt as a percentage of GDP has remained relatively stable over the past decade as can be seen in Figure 5.

Figure 5: General government gross debt (% of GDP)



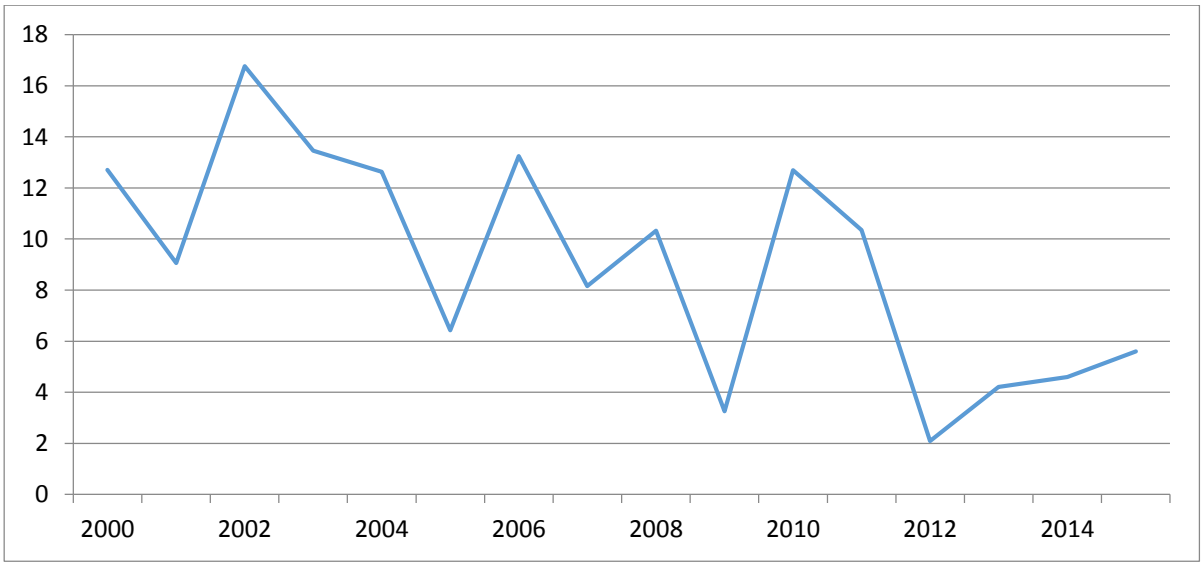
**Years 2014 to 2019 are projections*
Source: International Monetary Fund, World Economic Outlook Database, Accessed January 5, 2015; IMF, 2015a

Although the government is attempting to introduce important structural reforms, significant governance challenges remain on the fiscal front (Bertelsmann Stiftung, 2014; IMF, 2015b). Mozambique's civil society is still in a relatively early stage of development. The government has had limited capacity for oversight of budget planning and execution. Third-party monitoring of government activity is also limited. , and (Bertelsmann Stiftung, 2014). The government does not maintain a complete and up-to-date inventory of public enterprises and publicly-owned corporations, and the net asset value of these entities remains unknown (IMF, 2015b).

Corruption is also an ongoing concern (Transparency International, 2012). The government has sought to improve the country's governance largely through decentralization. However, implementation of policies aimed at decentralization have resulted in administrative diffusion rather than true decentralization, as state-level representatives have moved to operate and assist at subnational levels. The result has been a parallel functioning of state and municipal representatives at subnational levels rather than increased delegation of power to subnational authorities (Bertelsmann Stiftung, 2014).

Mozambique has been exceptionally successful at controlling its inflation rate for the period from 1992 to 2014. In 1992, at the end of the civil war, the inflation rate stood at 45.5 per cent, and has lowered significantly since then. As Figure 6 demonstrates, inflation rates fell to between 2 and 14 per cent as of 2003. However, there has also been a fair amount of volatility during this period, indicating price instability. While the country recorded its lowest inflation rate to date of 2.1 per cent in 2012, rates have since crept up and rose to 4.6 per cent in 2014.

Figure 6: Inflation rates

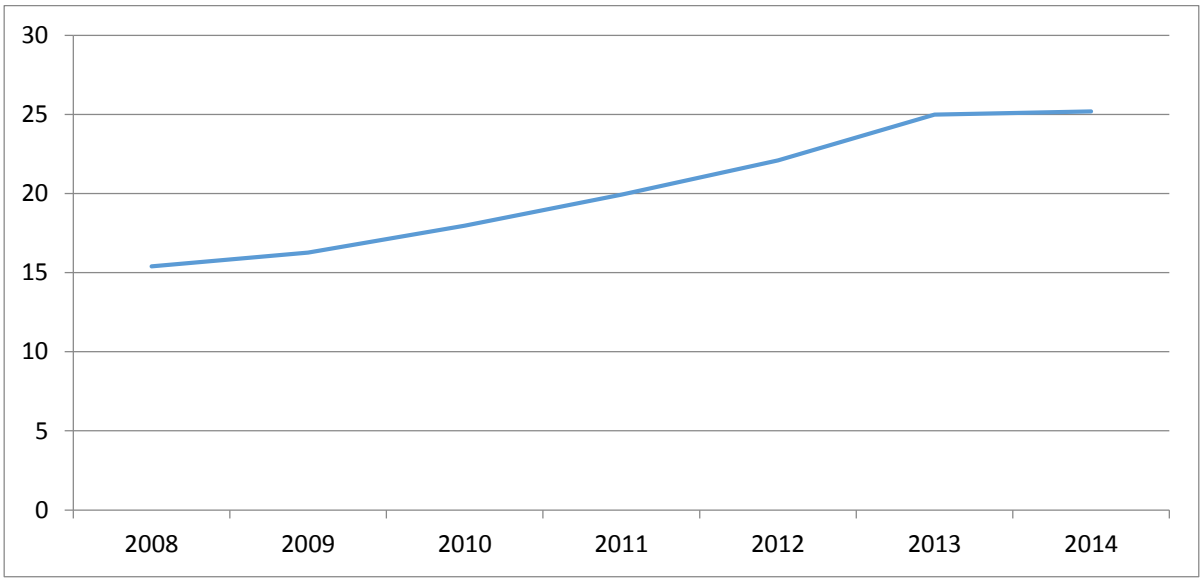


**Years 2014 and 2015 are projections*
Source: International Monetary Fund 2015c

3.2 Revenue

Government revenue in Mozambique is a mix of domestic revenue, donor grants and external loans. In 2014, domestic revenue accounted for about 64.8 per cent of total government revenues, with donor grants and external loans accounting for 12.2 and 23 per cent, respectively (GOM, 2014f). As seen in Figure 7, Mozambique's tax revenues have been increasing incrementally over the past decade, coming in at 25 per cent of GDP in 2014 (GOM, 2014c; GOM, 2014f).

Figure 7: Tax Revenue (% of GDP)



**Years 2008-2013 are drawn from the national accounts and 2014 from projections found in Mozambique's 2014 national budget*
Source: GOM, 2014c; GOM, 2014f

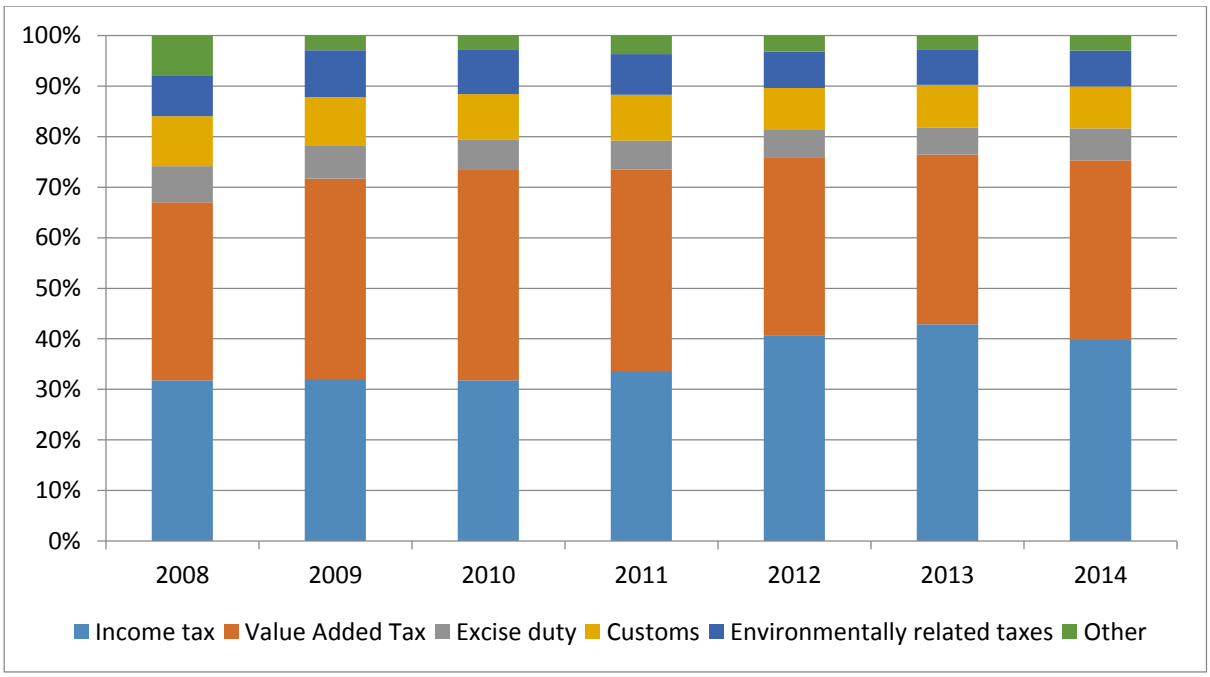
The government aims to increase, and importantly expand, its tax revenue base in the coming years by, among others, taxing capital gains of enterprises that exploit natural resources (GOM, 2014f; Almeida-Santos, Monge Roffarello & Filipe, 2014). This is imperative given government expansionist policies aimed at growing the economy and improving social welfare. In order to mitigate the growth in the country's fiscal deficit associated with these policies, the government plans to expand its tax base to include 600,000 new taxpayers, to improve the efficiency of tax administration and to incentivize

production and productivity growth in the private sector (GOM, 2014h). The country's Medium-Term Fiscal Framework predicts that the government will increase revenue collection by 0.5 per cent of GDP per year between 2014 and 2016 (Almeida-Santos, Monge Roffarello & Filipe, 2014). In addition, the government intends to revise its taxation policies for megaprojects. Currently, tax income from production taxes on natural resource projects and production, dividend and concession taxes on energy projects contribute an average of 5 per cent to government revenues, but could potentially be increased to 30 per cent if tax reforms relating to enhanced efficiency in revenue collection and renegotiation of megaproject contracts are undertaken (Bertelsmann Stiftung, 2014).

There is an urgent need for tax reform, as financial transfers from international donors are increasingly being tied to reforms to expand the fiscal base and facilitate more inclusive growth (Bertelsmann Stiftung, 2014). Since 1999, Mozambique has received General Budget Support (GBS) from a group of donors, including the European Union and the World Bank. Funds are conditional on the government prioritizing poverty reduction in line with the Action Plan for Reducing Absolute Poverty (PARPA) (Batley, Bjornestad & Cumbi, 2006). There are also demands related to governance, accountability, transparency and efficiency, with some donors having already suspended direct budgetary support as a result of unmet expectations (Bertelsmann Stiftung, 2014; AllAfrica, 2014; Mail&Guardian, 2014). Given the country's reliance on these financial transfers,[4] these accountability demands present a significant fiscal risk to the country, but can also be used as a crucial trigger for implementing required reforms.

As can be seen in Figure 8, income taxes and value-added taxes (VAT) form the lion's share of government tax revenue. It is worth noting that environmental taxes constitute a sizable share of tax revenue in Mozambique. For a breakdown of environmental taxes see Figure 9 and for a more detailed discussion see section 3.

Figure 8: Tax revenue by main revenue source

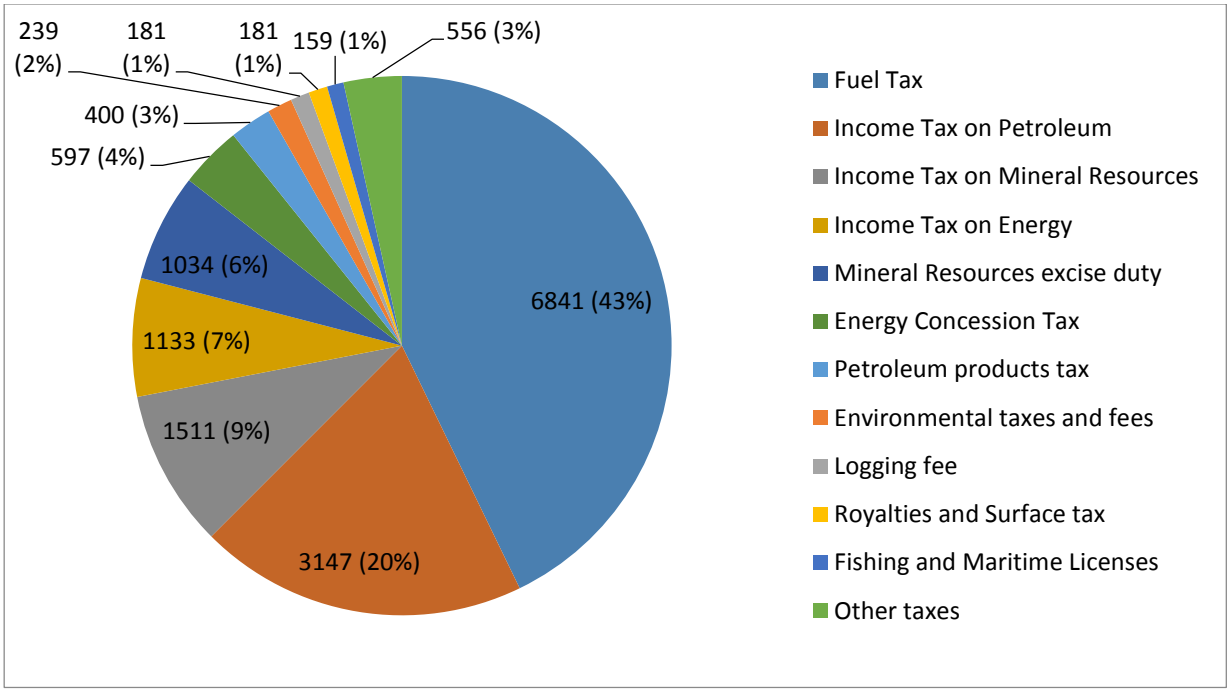


**Years 2008-2013 are drawn from the national accounts and 2014 from projections found in Mozambique's 2014 national budget*
Source: GOM, 2014c; GOM, 2014f

Figure 9 provides a breakdown of the country's environmental taxes. These taxes are discussed in detail in the respective sectoral subsections below.

[4] Direct budget support from donors amounted to 10.3 per cent of GDP in 2013 (IMF, 2015b).

Figure 9: Overview of revenues from environment-relevant taxes and charges in 2014 in MZN millions and % share of total



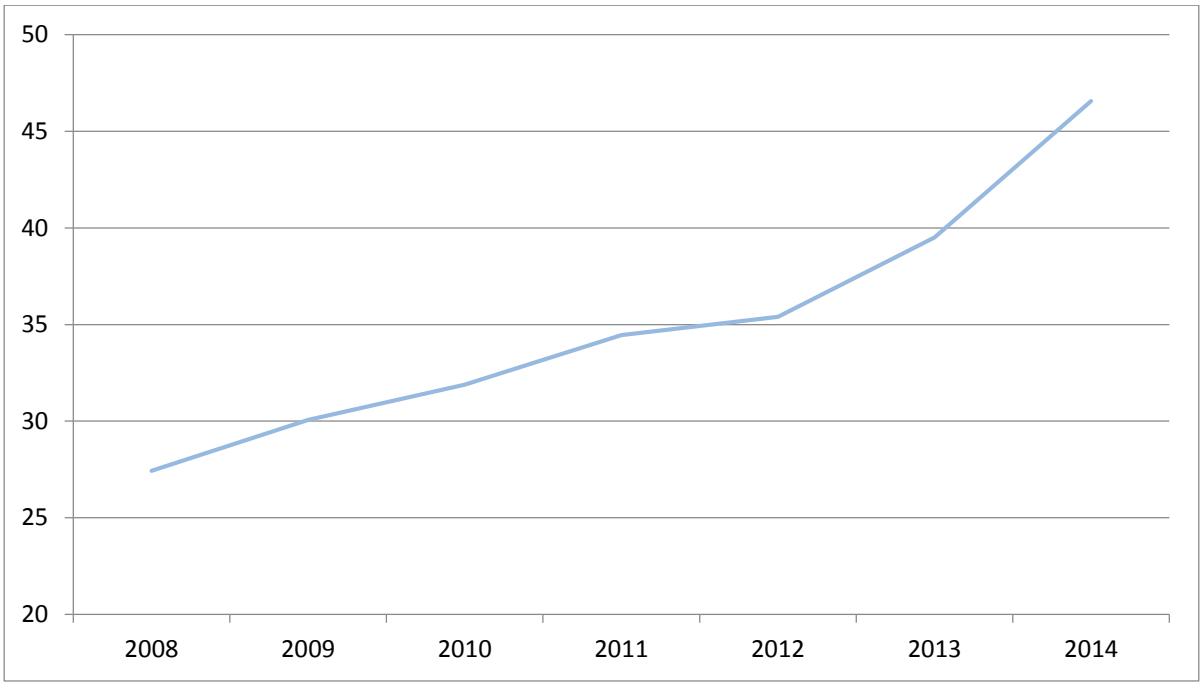
Source: GOM, 2014c; GOM, 2014f

3.3 Expenditure

Like revenue, public expenditure has increased significantly in the past decade, with total expenditure growing from 22.9 per cent in 2005 to 47 per cent of GDP in 2014 (Almeida-Santos, Monge Roffarello & Filipe, 2014), as can be seen in Figure 10. This has been driven in part by the government's aforementioned expansionary fiscal stance. In 2014, current expenditure was 22.7 per cent of GDP, while capital expenditure was 23.9 per cent of GDP (GOM, 2014f), with an increase in expenditure seen across both current and capital spending. While unrestrained spending and growing deficits can be detrimental to economic growth, the country's expansion of capital expenditure should drive transformational reforms that will encourage development, and debt as a share of GDP should stay relatively stable.

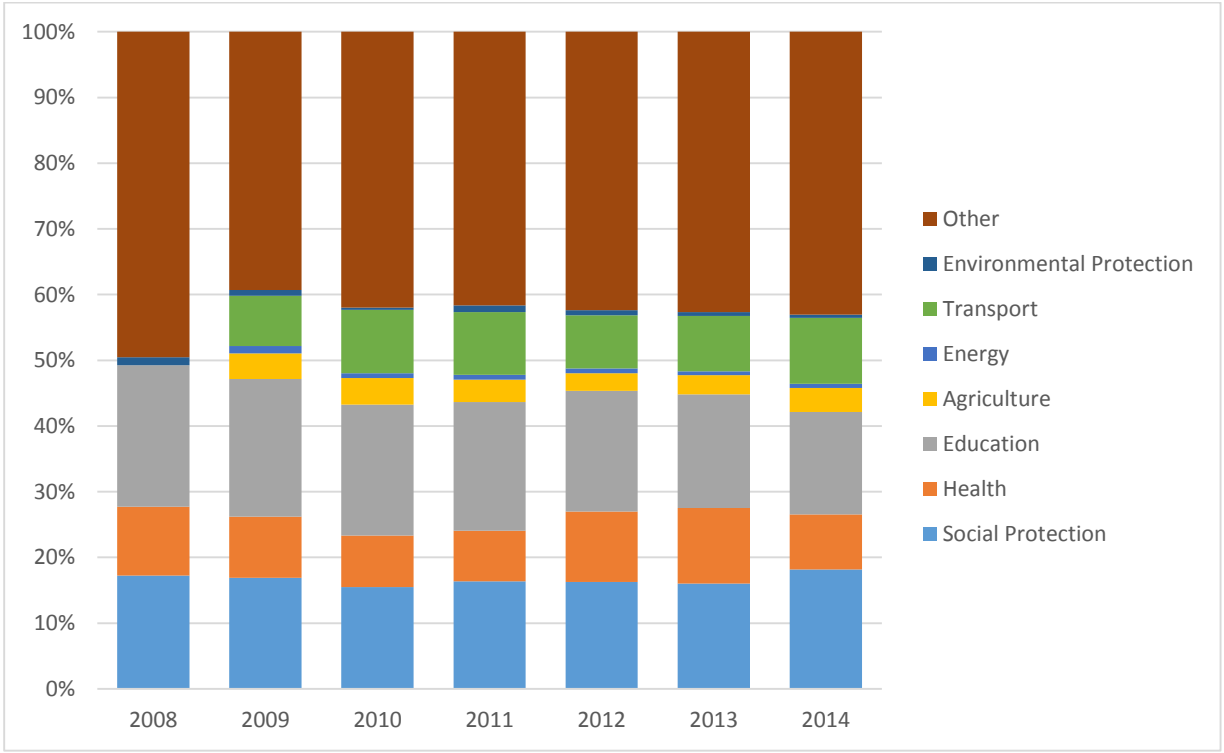
However, increased public expenditure has not benefitted all sectors of the Mozambican economy. As mentioned in section 2, the quantity and quality of services provided by Mozambique's social support system needs urgent improvement. As a share of total expenditure, spending on social protection, health and education has been falling since 2008, as can be seen in Figure 11. In addition, there is evidence that past aggregate increases in expenditure on social support systems were undermined by delays in the disbursement of funds and by ineffective management (Almeida-Santos, Monge Roffarello & Filipe, 2014). Partially because of this, Mozambique was ranked 128th in the Global Competitiveness Report with regards to the "diversion of public funds", and will face considerable challenges in its efforts to improve its social safety net if corrective measures are not taken (Almeida-Santos, Monge Roffarello & Filipe, 2014).

Figure 10: Public expenditure (% of GDP)



**The data for 2008-2013 are drawn from the national accounts, and 2014 from projections found in Mozambique's 2014 national budget*
Source: GOM, 2014c; GOM, 2014f

Figure 11: Expenditures by main spending area (% of total)

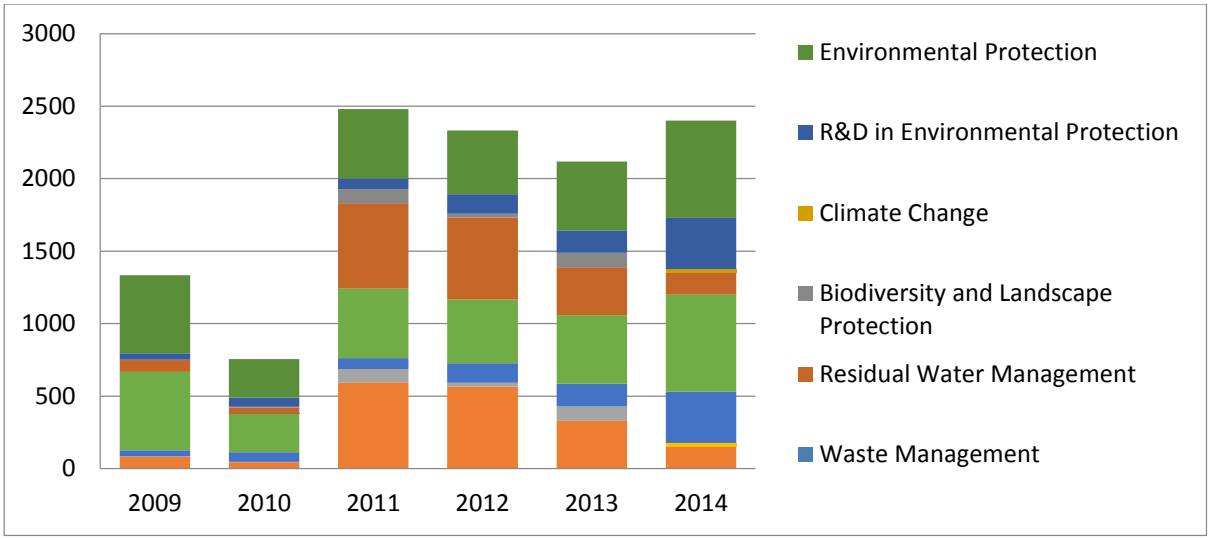


**Data for 2008-2013 are drawn from the national accounts and 2014 from projections found in Mozambique's 2014 national budget*
***'Other' includes government spending on general public services, commerce, industry, communication, housing and collective development, recreation, culture and religion*
Source: GOM, 2014c; GOM, 2014f

Figure 12 provides an overview of the functional distribution of historical environment-related expenditure in the country. While substantial sums are being allocated toward environmental protection, governance challenges are limiting the effectiveness of these measures. These challenges include

institutions that lack adequate human capacity and financial resources (UKDFID, 2011), poor organization and coordination of key institutions, and dispersed mandates for various aspects of environmental protection among several ministries with lines of responsibilities that are often blurred, making "the concentration of human and financial resources and equipment for the protection of the environment (difficult)" (USAID, 2013).

Figure 12: Functional distribution of environment-related expenditure, MZN millions



**Data for 2008-2013 are drawn from the national accounts, and 2014 from projections found in Mozambique's 2014 national budget*
Source: GOM, 2014c; GOM, 2014f

Table 1 below illustrates that there are also a range of environment-relevant programme expenditures, although their targeting and the degree of overlap with the expenditures seen in Figure 12 is not clear from budget documents. Table 2 provides an overview of expenditure associated with various environment-relevant sectoral funds, for which more details were available in the literature. These funds are discussed in their respective subsections below.

Table 1: Environment-relevant programme expenditure, 2014, MZN thousands

Description	Investment Expenditure			Total Expenditure
	Internal	Foreign	Total	
Road system infrastructure construction	8342.27	5983.90	14326.16	14326.16
Agriculture, silviculture, fishing and hunting	1986.19	234.58	220.76	3244.42
Road system operation	1223.27	35.94	1259.21	1382.79
Rural water supply	314.70	1003.57	1318.27	1318.27
Electricity	779.13	264.63	1043.76	1193.77
Fishing	280.14	488.91	769.05	1017.84
Urban water supply	408.71	603.79	1012.50	1012.63
Agriculture, silviculture, livestock and fishing R&D	404.19	25.94	430.14	776.29
Water supply	405.71	231.38	637.09	668.77
Transport	285.82	74.43	360.25	562.71
Environmental protection	72.07	213.60	285.67	509.35
Air transport infrastructure construction	470.92	18.29	489.21	495.98
Irrigation	303.82	-	303.82	310.09
Rural extension	51.09	141.09	192.18	196.45
Environmental protection R&D	80.32	32.68	112.99	161.93
Residual water management	148.52	1.62	150.13	150.13
Water transport system operation	32.27	-	32.27	145.89
Plague control	120.30	-	120.30	120.30
Air transport operation	4.96	-	4.96	71.36
Water transport infrastructure	31.01	-	31.01	70.88
Climate change	1.55	8.02	9.57	20.37
Land reform	7.49	-	7.49	10.41

Source: GOM, 2014c

Table 2: Environment-relevant fund expenditure, 2014, MZN thousands

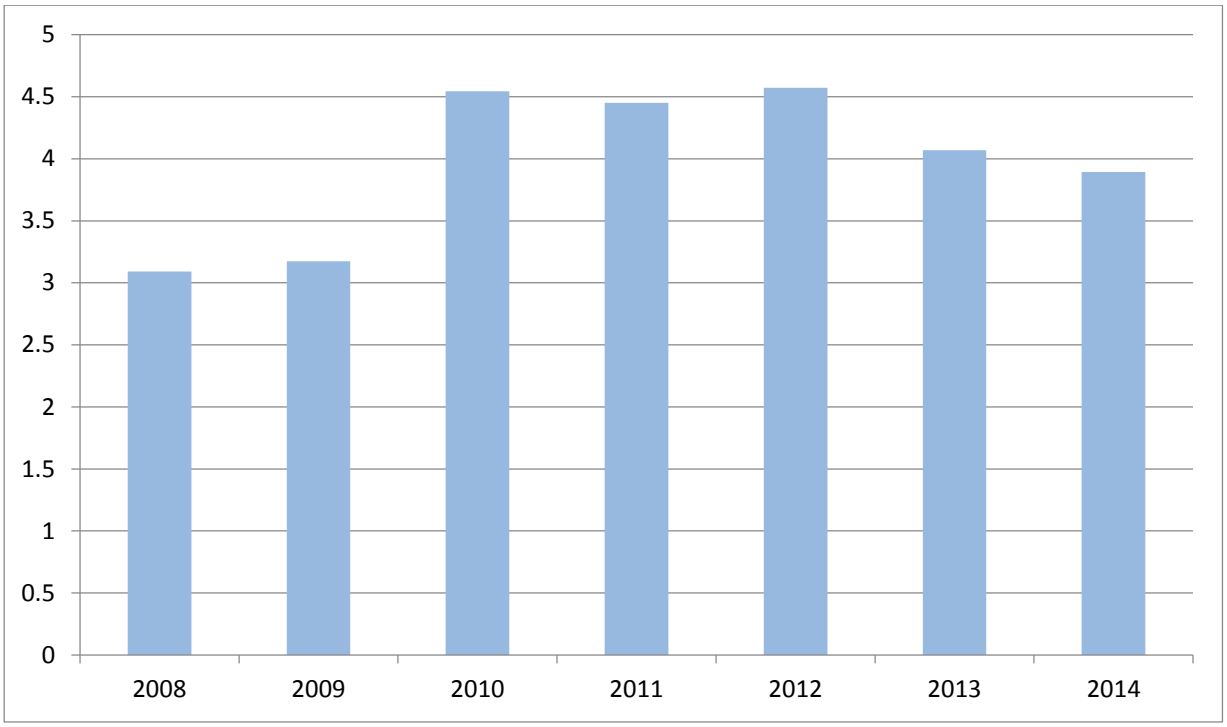
Priority Sector/Institution	Investment Expenditure			Total Expenditure
	Internal	Foreign	Total	
Roads Fund	10617.46	6152.12	16769.58	16769.58
Water Supply Investment and Assets Fund	427.65	603.83	1031.48	1031.48
National Energy Fund	553.23	272.30	825.53	871.60
Fishing Foment Fund	24.60	95.21	119.81	151.52
National Institute of Aquaculture Development	82.02	85.67	167.69	198.35

Source: GOM, 2014c

As can be seen in Figure 13, direct subsidies and transfers[5] have fluctuated between 3 and 5 per cent of GDP in recent years. Detailed information on the targets or recipients of these subsidies was not available in all cases, but section 3 discusses the cases where information was available, particularly in relation to subsidies for the cost of fuel.

Figure 13: Subsidies and transfers (% of GDP)

[5] Based on information in the country's national accounts and public budgets, the government considers subsidies to include grants to maintain/reduce prices (fuel and wheat) which are also aimed at curbing the deficit of public enterprises. The government considers transfers to include various types of social support transfers to citizens (GOM, 2014c; GOM, 2014f)



**Data for 2008-2013 are drawn from the national accounts, and 2014 from projections found in Mozambique's 2014 national budget*
Source: GOM, 2014c; GOM, 2014f

4. Green Fiscal Reform in Mozambique

This section addresses Green Fiscal Reform (GFR) in Mozambique, focusing on the energy, mineral resources, transport, water, fisheries, and forestry sectors in particular. These sectors were chosen due to their known significance in GFR policy-making (OECD, 2005; World Bank, 2005) and due to their economic and social importance in Mozambique. Sections 4.1 to 4.6 provide an overview of each specific sector, highlight its main environmental challenges, present an inventory of existing GFR policies in the sector, and finally, discuss some relevant GFR policy options for the sector. As will be shown below, a considerable amount of GFR-relevant policies and measures are already in place in Mozambique; however, the government has a range of other available GFR policy options which can further support its green economy transformation.

4.1 Energy

While primary energy resources are abundant in Mozambique, only 38 per cent of Mozambicans have access to electricity (GOM, 2012a). Table 3 provides an overview of Mozambique's electricity tariff structure. Cahora Bassa Hydroelectric (HCB) is the main source of electricity generation in the country, and total generation capacity stands at 2,600 MW (GOM, 2012a). Electricity exports to South Africa and Zimbabwe, mostly derived from hydro, are substantial, amounting to nearly 9.5 million MWh in 2012 (GOM, 2012a). Most of the electricity exports go to South Africa due to long-standing export agreements associated with a number of Mozambique's electricity generation projects in the south. Hydropower production potential in Mozambique is quite significant at 12,500 MW per year, twice as much its relatively water-rich neighbour, Zambia (OECD, 2013), and three of Mozambique's ten megaprojects in the electricity sector are for hydro development, as seen in Table 4. However, despite hydro's importance for electricity, most Mozambicans rely on biomass for their energy needs and this is expected to remain the case for some time, as seen in Figure 14. For those without grid access, diesel is the primary source of electricity, and the government provides a subsidy to lower the price for owners of small-scale diesel generators.

Table 3: Electricity tariff structure

Recorded Consumption (kWh)	Sale Price			
	Social Tariff (MZN/kWh)	Household Tariff (MZN/kWh)	Farming Tariff (MZN/kW)	General Tariff (MZN/kW)
From 0 to 100	1.07			
From 0 to 200		2.34	2.36	2.61
From 201 to 500		3.11	3.36	3.74
Above 500		3.27	3.68	4.09

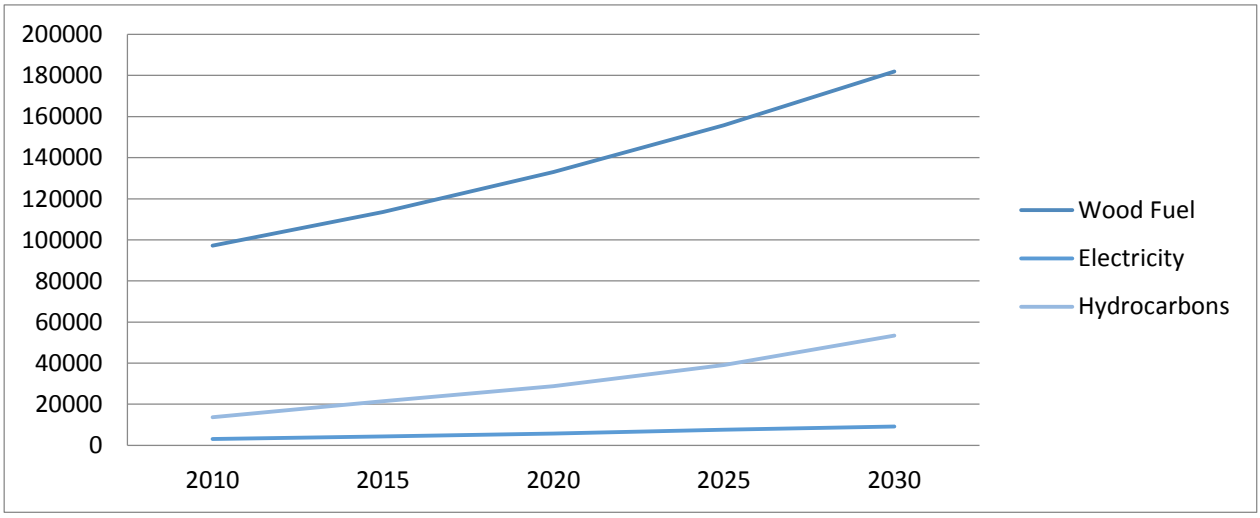
Source: Electricidade de Mocambique, 2014

Table 4: Megaprojects in the electricity sector

Project	Type of Plant	Investment (MZN million)	Location	Capacity	Type of Contract	Operational in
Central Térmica a Gás Natural de Ressano Garcia	Gas	6.45	Ressano Garcia (Boane District)	175 MW	PPP (EDM-Sasol)	2015
Linha de Transporte de Energia Tete - Maputo	Transmission line	61.04	Tete - Maputo	3000 MW (phase 1)	PPP	2017
Central Hidroeléctrica de Mpanda Nkuwa	Hydro	135.64	Zambezi river	1500 MW	PPP (SOC Hidro MNK)	2017
Central Hidroeléctrica de Lúrio	Hydro	15.50	Lúrio	180 MW	PPP	-
Linha de Transmissão Caia – Nacala	Transmission line	13.24	Caia - Nacala	400, 220 and 110 kV	Public	-
Central Hidroeléctrica Cahora Bassa Norte (CBN)	Hydro	22.68	Tete	1245 MW	HCB/CEZA	-
Refinaria de Produtos Petrolíferos	Oil	161.48	Nampula	300,000 bl/day	-	-
Central Térmica de Gás Maputo	Gas	5.55	Maputo	70 - 110 MW	JICA (EDM)	-
Central Térmica de Carvão de Moatize	Coal	29.07	Moatize	330 MW	PPP (VALE)	-
Central Térmica à Carvão de Benga	Coal	41.99	Benga	450 MW	Rio Tinto	-

** A dash indicates that a projected operational date was not available in the literature*
Source: GOM, 2014e

Figure 14: National energy consumption (GWh) in Mozambique



Source: UNEP RISOE, 2013

Mozambique's coal reserves are among the largest in the world (GOM, 2012a). The Moatize coal basin in Tete province represents the world's largest untapped coal reserve with an estimated 6 billion tons, and proven coal reserves in the country could produce more than 8,000 MW, enough base load power for 30 years (Electricidade de Mocambique, n.d.). Since 2009, Australia, Brazil, Italy, South Africa, the United States and more recently China have been provided several billions of United States dollars in FDI to develop the country's coal and natural gas resources (GOM, 2012a). In 2013, the extractive sector was the fastest growing sector, at 22 per cent annual growth, largely propelled by coal exports (Almeida-Santos, Monge Roffarello & Filipe, 2014). Two large-scale coal projects currently being developed by the mining companies Vale and Rio Tinto are operational, and a number of additional projects are planned or at an early stage of construction. These projects have the potential to bring coal exports to 5 million tons in the coming two years and up to 20 million tons within two decades (Dominguez-Torres & Briceno-Garmendia, 2011).

The development of the Moatize coal basin's reserves could be a significant source of economic growth for the country, as coking coal could contribute to export revenue, and thermal coal to generating energy domestically and improving energy security (GOM, 2012a). However, the potential for associated pollution and increased greenhouse gas (GHG) emissions stemming from development of the country's coal reserves have also been noted by the government (GOM, 2012a).

Mozambique also has substantial natural gas reserves, estimated by the government at 277 trillions of cubic feet (GOM, 2014g). The country's Temane gas fields have been under exploration since 2004. Additional gas reserves estimated at 150 trillion cubic feet were discovered in the Royuma Basin, making it one of the world's largest known gas reserves (Almeida-Santos, Monge Roffarello & Filipe, 2014). The country's onshore gas reserves are substantial and already under development by the South African company Sofala, production is expected to begin in the Basin in 2018/19 (Electricidade De Mocambique, n.d.; Gqada, 2013). The government has been considering whether to develop natural gas resources purely for export or to set aside a portion for domestic use and export the rest (Gqada, 2013). The government and an international consortium are currently in negotiations to build a US$ 40 billion liquefied natural gas (LNG plant); however, these negotiations are not expected to be finalized before 2020 (Almeida-Santos, Monge Roffarello & Filipe, 2014). Before the full domestic and export potential of natural gas production can be achieved, the relevant infrastructure for development of these offshore reserves will need to be put in place. Moreover, the global growth in gas production capacity makes the timeline and the ultimate economic viability of developing natural gas in Mozambique uncertain over the medium term (Almeida-Santos, Monge Roffarello & Filipe, 2014).

In terms of energy projects for domestic consumption, there is an opportunity in the north to develop medium-to-large gas generation projects that could serve the region (traditionally underserved in terms of electricity provision), as well as the country as a whole (Almeida-Santos, Monge Roffarello & Filipe, 2014). However, as outlined below the grid infrastructure would need to be greatly expanded to ensure effective provision of electricity in the region. Mozambique's gas reserves could also help facilitate the development of domestic industries with greater value-added, such as iron, steel, power and a diversity of downstream hydrocarbon related products, as well as create domestic small-scale manufacturing and employment opportunities for retail natural gas sales to domestic and small business use (Almeida-Santos, Monge Roffarello & Filipe, 2014). As a cleaner burning fuel, domestic development of natural gas could contribute to Mozambique's transformation to a green economy (GOM, 2012a).

Inadequate grid infrastructure in a large country like Mozambique is a challenge for the energy sector as electricity generation sources tend to be a distance away from load sources. The government is convinced that adequate and massive power infrastructure is fundamental to sustaining economic growth in Mozambique (Electricidade De Mocambique, n.d.). As of 2013, it was unclear whether the government had any plans to connect the largest public utility company in the country, Hydroelectrica de Cahora Bassa to the national grid, thereby ensuring that there are transmission lines between its power plants and Maputo. The absence of current transmission lines means that the company first needs to export the bulk of its power generation to South Africa, which then sells it back to Mozambique. In

addition, the agreement under which this arrangement is managed was reached in 1969 and has never been revised (OECD, 2013). In rural areas, the instability of the grid is a major source of concern, and acts as a constraining factor for industrial development (GOM, 2012a; GOM, 2012b). Grid inefficiency is another important constraint which if addressed could open up significant additional export opportunities for the country (Dominguez-Torres & Briceno-Garmendia, 2011). The financing needed to catalyse the country's electricity generation potential and improve its grid infrastructure is substantial. Realizing a national access rate of 20 per cent would require an additional investment of US$ 771 million per year, roughly 85 per cent of the total amount of funding needed for the country's other three important investment sectors (transport, water and sanitation) (OECD, 2013).

Environmental challenges

According to information provided in the country's most recent national communication to the UN Framework Convention for Climate Change (UNFCCC) in 2006, the energy sector contributes a little over 10 per cent of Mozambique's national GHG emissions. This share could grow substantially as the country's significant coal and natural gas resources are developed (GOM, 2012a; Olund Wingqvist, 2011). However, the more immediate environmental concern presented by the energy sector is not its GHG emissions but rather the current and potential pollution of land, water and air at and in the vicinity of coal and gas extraction sites, and the potential impacts on human and ecosystem health (Olund Wingqvist, 2011). These activities take the form of "clearing of virgin forests, degradation of agricultural soils, and other unwanted aspects",[6] of energy resource development (GOM, 2012a). Mitigating the energy sector's impact on the country's natural environment will be one of the most fundamental challenges that the government faces in developing its substantial energy resources. However, environmental management and protection in Mozambique has sometimes been compromised as implementation and enforcement have tended to be weak despite the introduction of strong environmental legislation (Walmsley and Patel, 2011; UKDFID, 2011; USAID, 2013; EIA, 2013). More broadly, the government will need to wean the country off its reliance on the exploitation of natural resources for much of its economic growth.

The energy sector is also expected to be impacted by seasonal changes from climate change, particularly with respect to its hydroelectric resources (Olund Wingqvist, 2011).[7] Recent forecasts indicate that climate change will increase the frequency, intensity and magnitude of natural disasters, which could, in the absence of investments in resilience measures, result in damages in "agriculture, infrastructure and energy production" and lead to losses of US$ 450 million by 2040 (GOM, 2014d). Climate change and related changes in weather patterns pose a particular concern for Mozambique as it is already prone to natural disasters. The country is hit by one tropical cyclone per year and a severe drought or flood once every 3 to 4 years on average (Olund Wingqvist, 2011; GOM, 2014d).

Current GFR policies

Mozambique has a number of GFR-relevant policies in place in the energy sector, including a petroleum products tax, charged on the market price of petroleum products produced in the country. The tax is set at 10 per cent for crude oil and 6 per cent for natural gas, with a 50 per cent discount when products are destined to be used in the development of local industries (GOM, 2014c). In 2014, this tax raised MZN 401 million (US$ 12.2 million). Mozambique also has a tax on fuel which is charged on all fuel products produced or imported and sold in Mozambique. The rates of taxation are summarized in Table 5.

Table 5: Taxes on generation fuels in Mozambique[8]

[6] See section 4.6 for a detailed discussion of forestry-related environmental challenges.
[7] See section 4.4 for a detailed discussion of environmental challenges related to water resources.
[8] See section 4.1 for taxes on transport fuels.

Fuel	Tax
LPG	470.70 MZN/kilogram
Diesel	3024.70 MZN/litre
Fuel oil	544.20 MZN/litre

Source: GOM, 2014c

By raising the prices of petroleum products, these types of taxes provide an economic incentive for the more efficient production or use of fossil fuels and encourage a switch to low-carbon alternatives. Tax rates should be indexed to economic growth rates or inflation to ensure that the level of the economic incentive is not reduced over time. Indexation is quite a common feature of GFR policies in several European countries for example Denmark has indexed excise duties to inflation since 2008 (Eurostat, 2014).

On the producer side, the energy concession tax (charged on the recipients of government energy concessions) generated revenue of MZN 597 million (US$ 18 million) up until September 2014 (total revenue was MZN 803 million (US$ 24 million) in 2013 (GOM, 2014c; GOM, 2014f). Moreover, in 2014, taxes on the income of the energy and petroleum sectors, which are set at 32 per cent of profits, amounted to MZN 1,133 million (US$ 34.5 million) and MZN 3,147 million (US$ 96 million), respectively. These producer-side taxes are an important GFR policy, since they allow the government to capture some of the rents associated with the exploitation of the country's natural resources.

Revenues from t various energy sector taxes accounted for 4.2 per cent of the government's 2014 tax revenue and are summarized in Table 6.[9]

Table 6: GFR-relevant taxes and charges in the energy sector, 2014, MZN millions[10]

Description	Revenue	Contribution to environmental tax revenues (in %)
Income taxes from petroleum sector	3147.02	19.7
Income taxes from energy sector	1133.21	7.1
Energy concession tax (up until Sept. 2014)	597.32	3.7
Petroleum products tax	400.52	2.5
Total	**5278.08**	**33**

Source: GOM, 2014c; GOM, 2014f

In recent years, direct subsidies to energy producers have been limited, and mostly centred on support for hydropower projects. According to national budgets, the petroleum sector last received direct subsidies in 2009, amounting to MZN 15.3 million (US$ 0.5 million) (GOM, 2014f). However, while the incidence of direct subsidies has been limited in recent years, the energy sector benefits from a range of indirect subsidies. Indeed, one study has found that while the government has increasingly scaled back on its use of tax exemptions since 2002, "there have been allegations that natural resource contracts continue to give project-specific exemptions above and beyond the legislative framework." However, as in many other resource-rich countries, contracts in Mozambique are "currently not publicly available and make such claims difficult to verify"[11] (Columbia University School of International and Public

[9] This figure does not include the aforementioned fuel taxes because disaggregated figures for tax revenue from generation fuels versus transport fuels was not available. Fuel taxes are therefore accounted for in the transport subsection below. However, some of the fuel tax revenues would certainly be considered as energy-sector GFR revenues.

[10] The petroleum sector is counted separately from the energy sector in Mozambique's national accounts and in government budgets. The latter are distinguished by their focus on megaprojects in the energy sector.

[11] However, there is hope this situation will improve as the country engages in the Extractive Industries Transparency Initiative (discussed in the Mineral Resources section below) and implements transparency provisions in its 2014 hydrocarbons law, as discussed in Table 7.

Affairs, 2013). Therefore, while indirect subsidies are not readily identifiable or quantifiable, they should be the focus of further research in order to determine the net level of rent that the government receives from the sector, as well as the cost-effectiveness of fiscal support in light of the country's broader development and green economy transformation goals.

Mozambique's Parliament passed a new hydrocarbon law in 2014 which has important implications for the energy sector's fiscal regime going forward. The law includes provisions for a tax on 'super profits' in the sector, planned increases in surface taxes, and efforts to consolidate and clarify the sector's tax treatment. It also contains provisions for increased transparency in the hydrocarbon subsector. The pros and cons of this new law, based on analysis from the IMF and the Centre for Public Integrity (CIP), are provided in Table 7.

Table 7: Mozambique's 2014 hydrocarbon law – Overview of pros and cons

Pros	Cons
Requirements for publication of the main elements of all exploration and production contracts. Local content obligations support increased participation by the domestic economy in the growth, value-added-chain and respective jobs. These potentials have not been fully exploited yet.	The law earmarks a 25 per cent share of production to domestic markets, and mandates that some goods and services should be provided exclusively by Mozambican companies. This obligation can lead to inefficiencies if there is an implicit subsidy in the price used for the domestic market.
Strengthening reporting obligations from companies in extractive industries, in line with recommendations issued by the Extractive Industries Transparency Initiative (EITI).	Domestic suppliers may be too small or might not meet international quality standards on these huge projects. Their unification may however increase such chances and also lead to efficiency gains in the economic structure.
Clear consultation rules between the government, the companies and local communities in extractive areas. Financing may be possible due to other GFR elements.	Encourages the government and the private sector to expand their participation in projects, but it is not clear how the government will finance its share.
Requirements for public tenders to award contracts rather than direct negotiation between government officials and specific companies.	Introduces a new institutional set-up, which may generate coordination challenges with overlapping mandates and limited institutional capacity.
Consolidates extractive industry taxation rules into a single document, which helps provide a more consistent tax treatment and simplifies tax administration over time.	Lower royalty rates for the domestic market (which might generate tax leakage and complicate tax administration), mineral valuation rules, assessment of royalties on production (rather than sales), and the non-deductibility of royalties for the assessment of the corporate income tax.
Companies are required to present annual financial accounts certified by an independent auditor.	Although it improves contracting transparency, some changes fall short of international transparency standards, where all contracts are made public after their approval by the Administrative Court of Mozambique.
It maintains traditional charges and includes a tax on "super profits" that will allow the government to capture a higher share of revenues, responding to concerns that megaprojects benefited from relatively generous fiscal provisions in the past.	There is no explicit reference to EITI requirements on reconciling payments made by companies to the government, or to the new requirements on volume and sale prices data publication.
A comparison with pre-existing fiscal regulation shows that the government maintained or even reduced royalty tax rates. Nonetheless, surface taxes were intensified and their value are increasing over time.	In contrast to many other resource-rich developing countries, there is no specific legal framework for mining sector revenues.

Sources: IMF, 2015a; CPI, 2014

On the capital expenditure side, Mozambique has a National Energy Fund as outlined in Section 3.3, the goals of which are the development, production and use of different forms of low cost power; and the promotion of the conservation, rationalisation and sustainable management of power resources (National Energy Fund, 2014). Some of the projects being implemented through the National Energy Fund include:

- Construction of three photovoltaic stations in Niassa;
- Construction of Quissanga fuel station;
- Rotanda mini-hydro power plant;

- Electrification project for Maríngue and Gorongosa districts; and
- Photovoltaic systems of Tinonganine and Djabula, phase II.

Notably, three of the fund's activities explicitly call for development of renewable energy, albeit at times in conjunction with petroleum-based energy:

- To acquire, finance or supply financial guarantees for the purchase of equipment and machinery destined for the production and distribution of power, with particular attention to the use of new and renewable power sources.
- Publish and finance the preparation of studies and investigative papers on technologies for the production, distribution and conservation of power products or renewable power.
- To promote the development and planting of forests for biomass production.

However, the two activities explicitly focused on the development of energy in rural areas focus exclusively on petroleum products. These activities warrant closer analysis to determine if financial support being provided through the fund is working against the development of renewable energy for rural populations:

- To promote the installation or to install distribution networks of petroleum products in rural areas.
- To supply financial assistance for the sourcing of transport for petroleum products for the supply of rural areas.

GFR policy options

GFR measures can help limit the local impacts of the extraction of energy resources in Mozambique, and ensure that the energy mix achieves a balance between renewable and non-renewable sources. Such an outcome would align with the country's own green economy planning, which seeks to:

- Increase access to safe and sustainable energy services for the population;
- Promote renewable energy sources and low-carbon technologies; and
- Promote efficient energy use (GOM, 2012a).

The supply side of the energy sector offers significant potential for increased revenues, but realizing these revenues can be quite complex and/or difficult in practice. Capturing rents from development of the country's coal and natural gas resources can be accomplished through a range of measures, the most promising of which (from a GFR perspective) would be to place a price on carbon emissions and pollution associated with the production of coal and natural gas in the country. A typical solution for carbon pricing is a carbon tax system, which is relatively easy to implement given that measuring factual CO2-emissions is not required (as is often misperceived). The tax basis of CO2-emissions is calculated by taking the fossil fuel consumption and applying standard (or country-specific, once regularly monitored) measurements of the carbon contents of a specific energy unit to the quantities of fossil fuels, which are well known on the basis of invoices. This offers a reasonable and practically implementable approach for any developing country. Furthermore, it can act as an intermediary measure, as in the Mauritian experience where a carbon levy on fuels was originally instituted and later expanded into a more broad-based carbon tax (UNEP, 2014).

In addition, through platforms such as the EITI,[12] the government could identify the types of technologies that companies are using for energy production, and levy charges on the level of estimated GHG emissions and chemical pollution per unit of output associated with these technologies. Implementing such a system would be complex, but would help ensure that environmental externalities in the form of GHG emissions and chemical pollution associated with the production of these resources are reflected in agreements made with energy development companies. These types of taxes would also allow the government to fiscally recoup the cost of the environmental damage in-country as a result of production, regardless of whether the resources were intended for export or domestic use. Furthermore, because the tax would be based on carbon content, it would also encourage greater use of natural gas in domestic electricity generation – a cleaner burning fuel than coal. The use of natural gas would also be

[12] See the section on mineral resources sector below for more information.

more compatible with the intended increase in the use of renewable energies as it can complement fluctuating renewable energy sources due to its high flexibility in power generation.

The political economy of pricing GHG emissions and pollution from production can be difficult, especially in a country where resource development is so reliant on FDI, but it is still one of the most powerful GFR policy options available to the government. Pricing GHG emissions could be instrumental in ensuring that Mozambique's energy system and the development of its gas and coal resources could evolve in line with green economy principles. Such a policy could be complemented with a more general effort to secure more favourable terms with foreign investors and developers (discussed in the mineral resources sector section below). The financial proceeds of these policies could possibly be invested in a sovereign wealth fund or similar mechanism that would allow the government to use the wealth generated from exploitation of the country's natural resources for the long-term benefit of its people (see Box 1 for more information about sovereign wealth funds). If such a system were pursued, a clear, robust monitoring and evaluation system would need to be established to ensure proper stewardship of public funds.

As diesel generators are indirectly subsidized through a tax exemption, an additional GFR policy option the government could consider is the removal of subsidies on small-scale diesel generators, particularly as there is no similar exemption on the purchase of solar PV technology or other small- scale renewable energy technologies. Withdrawing this subsidy would send a clear price signal to consumers on the true relative costs of diesel to renewable generation when they are weighing electricity generation investment options. Allowing renewables to compete on a more level playing field in this way would not only help facilitate the shift to renewables in rural electrification (a policy goal which the government is already pursuing [GOM, 2012a]), but would help reduce government expenditure and thereby expand fiscal space. It would also contribute to displacing the use of biomass and help reduce deforestation in rural areas. Such a policy would of course need to be balanced with the need to provide low-cost electricity to those without grid access. Regardless of how taxes or subsidies are applied, the current state of affairs in which diesel generation is favoured over renewables should be reconsidered.

Box 1: Sovereign wealth funds and strategic use of resource-derived capital

Sovereign wealth funds (SWFs) are pools of assets that are owned and managed either directly or indirectly by governments. They are used as investment vehicles to achieve national objectives and are particularly useful as buffers against prolonged low oil prices, as well as a means to gradually reduce dependence on fossil fuel revenues. SWFs are typically supported by foreign exchange reserves, general taxes and revenues from fossil fuels. They remain nominally independent from the general budget, and are classified as either savings funds or stabilization funds. Savings funds aim to transfer wealth from current to future generations by saving existing revenues or making long-term investments for future use. Stabilization funds insulate the economy from commodity price volatility and external shocks. SWFs generally focus on investments in stocks, bonds, real estate, private equity and hedge funds. Governments also tend to have a high degree of flexibility with investment options due to the rarity of explicit expenditure requirements.

While wealth creation is the primary objective of SWFs, there is considerable potential for such funds to produce not only financial gains but also social and environmental benefits through strategic investment. This triple bottom line remains largely underutilized but is not unprecedented. Ghana, for example, has begun to allocate 30 per cent of its oil revenues to two SWFs, the Ghana Heritage Fund and the Ghana Stabilization Fund, with the intention of using its current oil wealth to support environmental, social, and developmental projects, thereby extending the benefits of revenues from natural resources to future generations. Chile's SWFs are also socially focused: according to the Ministry of Finance, they "contribute to macroeconomic stability and provide public goods with a view to bestowing better opportunities and improving social protection for Chileans." The Pension Relief Fund provides financing related to fiscal pension obligations aimed at assisting the poor, and the Economic and Social Reserve Fund provides funding to cover fiscal deficits and pay back public debt. With its initial contribution coming almost entirely from the Copper Stabilization Fund, the Economic and Social Reserve Fund continues to reduce dependency on global business cycles and revenue volatility derived from fluctuations in copper prices. Contributions to these funds come from fiscal surpluses, which are highly dependent on the price of copper and economic growth.

For an overview of best practices in establishing Sovereign Wealth Funds, including a case study on the Norwegian experience, see The Four Benchmarks of Sovereign Wealth Funds by Andrew Ang. accessible at:

https://www0.gsb.columbia.edu/faculty/aang/papers/The%20Four%20Benchmarks%20of%20Sovereign%20Wealth%20Funds.pdf.

1. Baunsgaard, T., et al. (2012). *Fiscal Frameworks for Resource Rich Developing Countries*. IMF.
2. Blundell-Wignall, A., et al. (2008). *Sovereign Wealth and Pension Fund Issues*. OECD.
3. Ministry of Finance, Chile. (2015). *Sovereign Wealth Funds – About the Funds*. Gobierno de Chile.

4.2 Mineral resources

In addition to significant hydrocarbon reserves, Mozambique is also well endowed with mineral resources, and produces a range of commodities, as seen in Table 8. Aluminum represents one third of its exports and there are significant deposits of gold, uranium, precious and semi-precious stones, limestone, iron ore, phosphates, tantalite, bauxite and heavy mineral sands, such as titanium ilmenite, rutile and zircon (Dominguez-Torres & Briceno-Garmendia, 2011; GOM, 2012a). Significant expansion of mineral resource extraction is expected in the years to come (GOM, 2012a).

Artisanal and small-scale mining is an important source of employment and livelihood for several communities. Gold and gems in particular are dominated by artisanal operations, and in central Mozambique alone employs 20,000 people (GOM, 2012a). However, much of this employment remains informal, and only 30 per cent of the workforce belong to trade unions. Notably, the sector is not integrated into any environmental, health or safety programmes (GOM, 2012a).

Table 8: Mineral resource production 2010-2013

Description	Unit	2010	2011	2012	2013
Worked Bentonite (Granada facetável)	kg	3 571	24 654	170 980	1 353
Bauxite	ton	8 556	10 352	8 633	6 190
Gold	kg	106	103	178	91
Worked Bentonite (Bentonite Tratada)	ton	459	493	846	93
Unworked Bentonite	ton	6 994	-	24 000	73
Beryl	ton	57	58	532	103
Aquamarines	kg	140	0	-	-
Tourmalines	kg	2 403	50	486 468	128 352
Quartz	kg	707 411	838 684	51 750	110 721

Source: GOM, 2013c

The government recognizes both the opportunities and the challenges presented by the growth of the mineral production sector, and is likewise aware of the risk of the 'resource curse' phenomenon, such as exchange rate appreciation, civil unrest, rent-seeking and under-investment in productive sectors (GOM, 2012a). Other challenges include under-investment of resource rents in human capital development and the related problem of focusing on primary resource exports with limited value added (GOM, 2012a; Almeida-Santos, Monge Roffarello & Filipe, 2014; Crook & Chikkatur, 2012).

Transparency and corruption are a source of concern in the mineral resource sector. In 2012, Mozambique achieved compliance with the EITI, which advocates for countries to introduce better transparency standards for payments generated from natural resources (GOM, 2012a). The EITI's fifth report on Mozambique, the first to be published since the country received its EITI compliant status in 2012, concludes that government agencies have improved the streamlining of data collection and compilation to ensure that extractive industries duly abide by the country's taxation measures and regulations. The report also notes that coordination among government agencies and bodies in charge of monitoring cooperation and compliance from extractive industries has also improved (intellica, 2014). Mozambique's new hydrocarbon law, discussed in Table 7, should help to drive greater transparency in the sector.

Environmental challenges

The mineral resource sector presents significant environmental challenges for the country. The fact that a significant amount of the sector is artisanal and informal, and thereby not subject to oversight or regulation, is a particular challenge. The use of mercury for gold-panning carries grave health risks to artisanal miners and local communities (especially pregnant women and children), and these activities can be a major cause of erosion and siltation (Olund Wingqvist, 2011). Site remediation is another challenge. When a mine becomes uneconomical, it is often shut down with little to no clean-up of the site, which can cause ongoing environmental issues in the area for decades. This is a problem in both the informal and the formal sector. Although environmental bonds purchased by licensed companies at the onset of operations are intended to cover the costs of any potential future environmental liabilities, they are rarely sufficient to cover the costs of clean-up. Other sources of concern in the sector include the effectiveness of environmental protection (as discussed in the energy section above), the lack of sufficient training of monitors, funding and equipment; and violations of licence terms or local environment-related laws which are likely to go unnoticed (and unpenalized) during operations (Crook & Chikkatur, 2012).

Current GFR policies

In terms of GFR-related policies, the corporate income of the mineral resources sector is taxed at 32 per cent of profits. The revenue from these taxes amounted to MZN 1,511 million (US$ 46 million) in 2014. Similar to income taxes in the energy sector, taxation in the mining sector is an important GFR policy because it allows the government to recover rents from the exploitation of its resources.

There is also a royalties and surfaces tax in place, which in 2014 generated MZN 181 million (US$ 5.5 million). Royalty rates are set at 10 per cent for diamonds; 6 per cent for precious metals, rocks and semi-precious stones; 3 per cent for basic metals; and 1.5 per cent for para sand and stones. The surfaces tax is a tax based on land area and is applied as follows (GOM, 2014f):

- Exploration licences:
  - First and second years: 17.5 MZN/hectare
  - Thereafter: 43.75 MZN/hectare
- Mining concessions:
  - Mineral water: 85 MZN/hectare
  - Other mineral resources:
    - First to fifth years: 30 MZN/hectare
    - Thereafter: 60 MZN/hectare
- Mining certificate:
  - First to fifth years: 17.5 MZN/hectare
  - Thereafter: 25 MZN/hectare

In addition, a mineral resources excise duty is in place and generated revenue of MZN 1034 million (US$ 31.4 million)[13] in 2014. Also, there are various, mostly small, mineral resource fees and levies, which together generated MZN 5.2 million (US$ 159,000) in 2014 (GOM, 2014c; GOM, 2014f). Altogether, these various taxes and fees amounted to 2.2 per cent of the government's 2014 tax revenue. In comparison, the Central African Republic, also a mineral-rich country, collected 11 per cent of the entirety of its tax revenues from the mining industry in 2010 (Fair Links, 2012).

The informal nature of the mineral resources sector is an important challenge, and steps are being taken to formalize the sector. This formalization process can be considered as an indirect GFR policy because of its revenue-raising potential (legitimate operations would pay taxes) and environmental benefits (legitimate operations would become subject to sectoral environmental regulations). The government has endorsed the voluntary standards of the International Finance Corporation (IFC) for the extractive industry.[14] The adoption of voluntary standards, together with corporate social responsibility (CSR) initiatives undertaken by mining companies, could facilitate the formalization of the sector and bring about greater implementation of safeguards, as well as measures to ensure their ongoing enforcement.

No direct subsidies for the sector were listed in the government's budget documents but as in the energy sector, the mineral resources sector benefits from indirect subsidies (Columbia University School of International and Public Affairs, 2013; Gqada, 2013). Even if these indirect subsidies are not readily quantifiable, they warrant further investigation in order to establish the net revenue that the government receives from the sector, as well as to determine the ultimate cost-effectiveness of indirect government support.

GFR policy options

As Mozambique's mineral resources sector continues to develop, it will be important to put in place environmental protection mechanisms that help ensure that mineral resource projects offer a net benefit

[13] Information on the targeting and level of this excise duty was not available in budget documents.

[14] Part of the World Bank Group, the IFC has implemented since 1 January 2012 the *IFC Performance Standards on Environmental and Social Sustainability*, which consist of eight standards that aim to ensure any kind of economic enterprise conducted under the IFC's guidance is accomplished in a way that will neither hurt nor harm the environment or communities where it is implemented. In doing so, the standards ensure projects which adopt them will be completed in cooperation with the community where introduced, good governance will be observed from inception to completion, the environment will be cared for in a sustainable manner, potentially affected communities will be compensated accordingly, indigenous people will have their voice heard, and that forced labour will be prevented, among other objectives. *IFC Performance Standards* accessible at:

http://www.ifc.org/wps/wcm/connect/c8f524004a73daeca09afdf998895a12/IFC_Performance_Standards.pdf?MOD=AJPERES

to the country. While there are a multitude of GFR policy options that could raise revenue while protecting the environment, the informal nature of the sector and the economic power of foreign companies operating in it make implementation challenging. The most fundamental GFR policy option available to the government is to develop better contract and licence terms with foreign companies that wish to operate in the sector. Ensuring that projects offer positive local economic impacts in terms of employment, human capital development and infrastructure development is paramount, and this is recognized in the country's green economy planning literature (GOM, 2012a) and its 2014 hydrocarbon law. However, the most important measure will be the scaling back and possible removal of the numerous tax rebates that megaprojects have tended to receive, which are known to be significant even if not readily quantifiable (Columbia University School of International and Public Affairs, 2013; Gqada, 2013). Such measures are put in place to attract investment, but the government and other observers have recognized that these large tax breaks and import exemptions have led to projects that are generally unfavourable to the country in terms of environmental impact and revenue generation, and that the government's contract negotiation capacity needs to be strengthened (Gqada, 2013; GOM, 2012a; Crook & Chikkatur, 2012).

Demanding better terms from foreign companies will help ensure that revenues from this growing sector can adequately offset the environmental damage associated with mining activities. In addition, a related and likely more difficult challenge is to secure better terms for existing contracts while ensuring that future investors seeking a stable investment climate are not deterred (Bertelsmann Stiftung, 2014).[15] While the importance of securing more favourable terms from foreign companies, especially as they relate to taxation, royalties and environmental bonds is clear, determining the most effective ways of accomplishing this is significantly less clear, and warrants further and more detailed analysis. An overview of best practices is provided in Box 2.

Box 2: Best practices for mining negotiations and contract design

The International Bar Association's Model Mine Development Agreement (MMDA) is a valuable tool for promoting sustainable development in mining operations and could be a useful resource for government officials and negotiators. The MMDA represents a paradigm shift towards interest-based negotiations that produce win-win-win scenarios for investors, governments and communities. In order for this to be achieved, however, governments must adequately prepare for the negotiations as they will be operating at information and resource deficits compared to investors. Governments as a whole must take responsibility for the negotiating process, rather than delegate responsibility to an individual ministry. Governments should not rush the negotiation process but keep to a pace that allows them to become properly informed. They must also adopt the stance of a resource owner rather than a beggar, begin to value the quality rather than quantity of investments, and screen investors prior to entering negotiations. Governments should also adopt long-term strategies when a contract negotiation is a starting point rather than an end point. Model contracts, thorough preparation and high levels of transparency are effective tools to move beyond short-term political interests.

The pre-negotiation phase should be dominated by gathering, organizing and identifying how to use information. First and foremost, a government needs to understand the full value of the resource and should never fully trust information provided by the investor; it is in the investor's best interest to undervalue the resource. Comprehensive valuation includes the basic market value of the resource, fiscal benefits to the government, dividends from share ownership or other equity arrangements, local purchasing of goods and services by the mining company, employment opportunities and human resource skills development, and lastly benefits from downstream processing or other value-addition requirements.

Negotiations should strive to maximize not only the economic but also social and environmental benefits by engaging local communities and developing ongoing processes among the mining company, community and government. Effective community consultations will identify clear lines of responsibility and accountability; these should take place well before negotiations commence, the company's history and the project's impacts should be fully disclosed, and a community engagement plan that meets minimum requirements of domestic and international standards should be formulated. It is imperative that this process is inclusive and that all voices

[15] Zambia's experience (and difficulties) in trying to institute reforms to the tax regime of its mining sector is highly instructive, and is explored in detail in "Caught in a Trap: Zambia's Mineral Tax Reforms" by David Moley, accessible at: http://www.ictd.ac/en/publications/caught-trap-zambia%E2%80%99s-mineral-tax-reforms

are heard; it may likewise be advantageous to hold separate consultation sessions for women in the community to ensure that participants speak freely and openly. Achieving and maintaining a social licence to operate is important for both investors and governments and should not be taken for granted.

In regard to land tenure and resettlement, the investor should be responsible for all payments and compensation for relocation, but the government should assist the mining company in understanding the local property rights regime, especially in the case of community or tribal ownership. Where appropriate, the investor should also assist the government in providing better health, education and energy services to the local community. The mining company's environmental management plan should effectively prevent unnecessary environmental degradation and mitigate damage that is essential to the operation. Additionally, in the case of rural areas, the plan must take into account the high degree of dependence among local communities on the environment for their livelihood. A thorough understanding of the economic and social relationships with ecosystem services is essential. Special attention must be paid to quality and quantity issues relating to water resources affected by mining operations, and collaborative efforts must be made to establish a clear protocol for water allocation priorities during periods of water stress. Climate risk assessments should also be conducted to improve the operation's resilience to climate change-related impacts. Minimization of the operation's carbon footprint is paramount, so investors must comply with existing laws, refer to best industry practices, and invest in further research on emissions reductions.

Mining investments occur within three legal contexts: domestic law, contracts between investors and host governments, and international investment treaties. If inconsistencies arise, domestic law should take precedence over the contract, and the contract should be interpreted in accordance with the law of the state in which the mine will operate. Should stabilization provisions be requested to reduce political uncertainty, it may be beneficial to exclude non-fiscal regulatory measures relating to issues, such as environmental protection and human health.

A strong, experienced negotiation team is crucial for an optimal outcome. The focus should be on translating existing policies into action rather than creating new ones, and negotiations should occur in a business-like setting. Effective negotiating demands a diverse range of expertise, governments should therefore seek external support to fill knowledge gaps. However, if an external consult is utilized, the government must retain complete control over decision-making and must remain aware of the potential biases of outside sources. A successful negotiation also depends on the investor believing the government is prepared to walk away and seek alternative sources of investment, and long-term success hinges on the inclusion of an effective community development agreement as part of this process. Before beginning negotiations, the host country must understand its own goals and positions as well as the specific needs of the investor. An agreement on how and what to negotiate must be reached, and all parties must remain within the negotiating scope and capacity. Governments should be wary of power plays in which the president of the mining company attempts to negotiate directly with the country's president or ranking minister. Above all else, it is important to remember that if an agreement is not reached, the resource is not lost and remains available for future development. If and when a contract is negotiated, it should be made publicly available to promote transparency and accountability.

1. International Bar Association. (2011). *Model Mine Development Agreement 1.0*.
2. Mann, H. (2015). *IISD Handbook on Mining Contract Negotiations for Developing Countries – Volume 1: Preparing for Success, International Institute for Sustainable Development*.

In addition to negotiating better terms for mining contracts, stakeholders at a national green economy validation workshop held in April 2015 in Motala, Mozambique recommended that a new law be issued to oblige mining companies to make a cash deposit before granting mines an operating licence. The proceeds of this deposit would be used for environmental remediation after the mine reaches the end of its productive life. Stakeholders reported that introducing a policy of cash deposits would need enabling legislation, and that this represents the main barrier to implementation of this type of policy. There should be obligations for any investor to deposit sufficient money in a fund, which is then only paid back after the site has been restored fully after the end of operations. A similar system has been applied in Viet Nam and/or Thailand and has been found to be quite effective. This deposit could complement or be used as a substitute for the environmental bonds discussed above, which are often insufficient to meet clean-up costs. Furthermore, the impacts of mining concessions on the availability of arable land could be explored and considered during each phase of the project, from research to licensing to operations. An increase to the country's surfaces tax could also potentially be used as a mechanism to

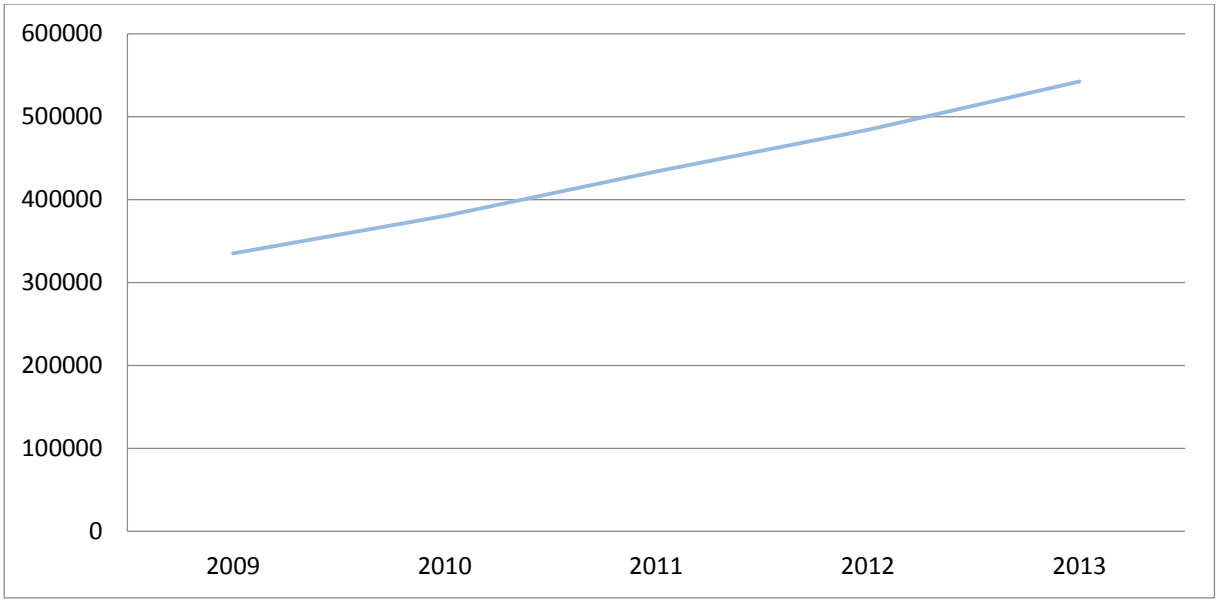
provide compensation for loss of arable land and to incentivize a minimal geographic footprint from mining operations.

An additional and important GFR policy option in the mineral resources sector is to increase monitoring and enforcement of both of formal and informal activity in the sector. As confirmed by stakeholders in the national validation workshop, it is not possible to verify if mining companies are complying with environmental indicators contained in environmental impact assessment legislation due to inadequate monitoring. On the informal side, identifying informal mining sites could facilitate their formalization, allowing greater tax and royalty revenue to be collected, and helping to ensure that projects adhere to environmental legislation and licence requirements. These measures could also make it possible to generate revenue from fines for off-licence activity and environmental violations. If well executed, the proper training, funding and equipping of monitors would likely pay for itself, and would simultaneously help ensure that existing environmental protection legislation is properly enforced. In addition to actions on monitoring and enforcement, urgent measures need to be taken to fight and control corruption, as losses due to the high volumes of unpaid taxes are substantial (Transparency International, 2014).

4.3 Transport

The transport sector has seen remarkable growth in the last decade. As seen in Figure 9, the number of vehicles in Mozambique is growing by over 10 per cent per year. Transportation infrastructure runs primarily from west to east, connecting mining and agricultural clusters in Mozambique and neighbouring countries with port facilities on the coast. However, for transport infrastructure to facilitate even further development, rural areas need to be better connected to markets in urban centres. Moreover, while road infrastructure is expanding fast, Mozambique still has one of the lowest road densities per person of any African country (Olund Wingqvist, 2011; GOM, 2012a). Funding the extension of the road network will be a significant challenge for Mozambique, since the government spends 80 to 88 per cent less on maintenance than what is needed given the size and condition of its road network (Dominguez-Torres & Briceno-Garmendia, 2011). Innovative solutions are therefore needed to meet the country's transport needs.

Figure 9: Number of vehicles in Mozambique



Source: GOM, 2013c

Because of its geographical position along the Indian Ocean and its natural harbours, Mozambique possesses a comparative advantage over its neighbours with respect to physical access to international markets (GOM, 2012a). The government intends to develop transport infrastructure that maximizes this

comparative advantage, and at the same time recognizes its responsibility for facilitating market access for its landlocked neighbours to encourage regional economic integration (GOM, 2012a).

Environmental challenges

According to figures prepared for the country's last national communication to the UNFCCC in 2006, the transport sector, including road, air, sea and pipelines, accounted for about 8 per cent of national emissions (GOM, 2012a). The greatest environmental challenge associated with the sector, however, is air pollution, particularly in urban areas, which is expected to continue to grow. There is significant scope to green transport infrastructure through low-carbon interventions and the development of public transport options.

Current GFR policies

With respect to GFR-relevant policies, the government has put in place a system of fuel taxes, as outlined in Table 10. As was discussed in Section 4.1, such taxes provide economic incentives to consumers to adopt more sustainable practices. In 2014, Mozambique's fuel taxes raised MZN 6,841 million (US$ 208 million), making them the most significant environmental tax in the country by far from a revenue generation perspective.

Table 10: Transport fuel taxes in Mozambique[16]

Fuel	Tax
Leaded gasoline	5482.30 MZN /litre
Unleaded gasoline	3289.40 MZN / litre
Diesel	3024.70 MZN / litre
Aviation gasoline	3311.10 MZN / litre
Jet fuel	713 MZN /litre

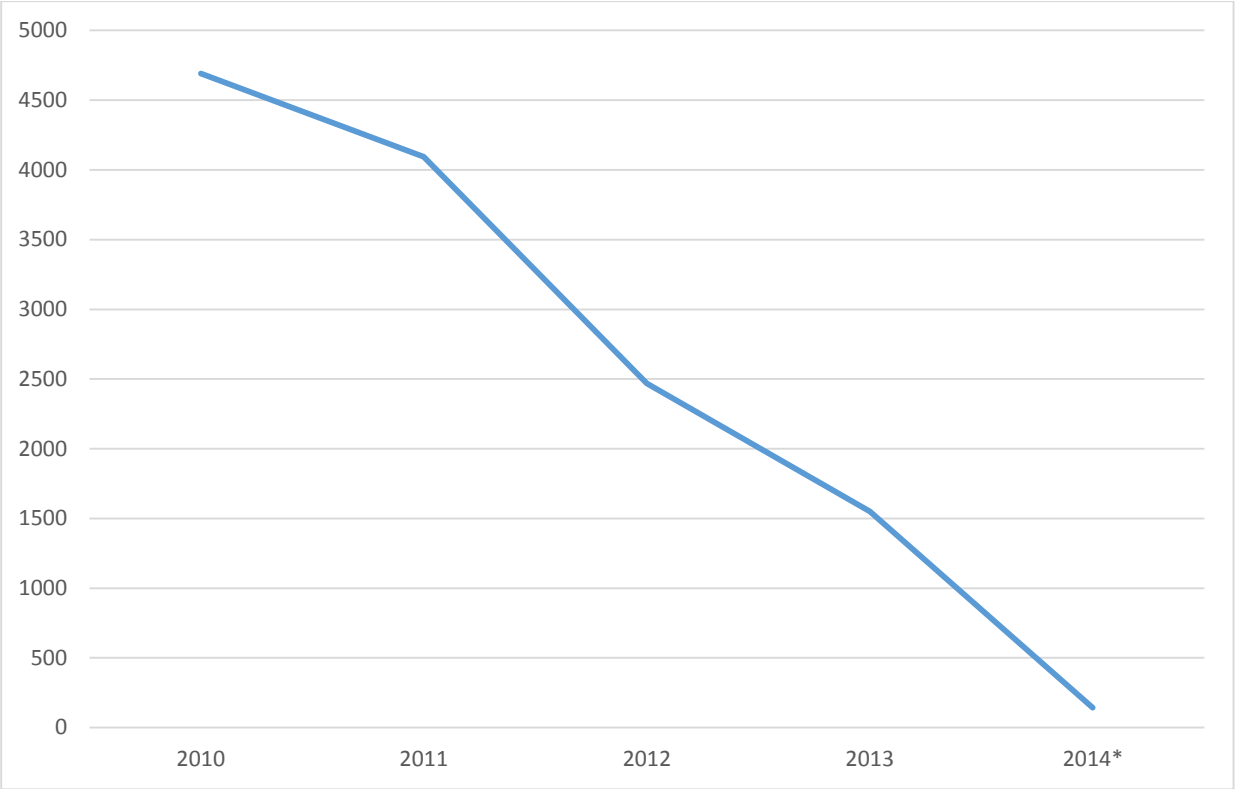
Source: GOM, 2014c

Mozambique has also had a fuel subsidy in place since 2010. The subsidy was introduced when civil unrest and riots broke out in reaction to the high cost of urban transportation and food (Olund Wingqvist, 2011). As seen in Figure 15, the fuel subsidy has proved to be quite costly.[17] It has incrementally been decreased over a number of years due to both declining fuel prices and as part of a gradual phase-out, but has yet to be eliminated entirely. The current low global oil price provides a window of opportunity to finalise the phase-out of this subsidy. Subsidizing the cost of fuels in this way offsets transport fuel taxes that are already in place, and thus limits the effectiveness of the GFR policy.

Figure 15: Fuel subsidy, MZN millions

[16] See section 4.1 for taxes on generation fuels such as LPG and fuel oil.

[17] In 2010, the government also instituted an urban transport subsidy for bus fares, but expenditure levels associated with this subsidy were not available in budget documents (GOM, 2014f).



**2014 data represents outlay only up until September 2014*
Source: GOM, 2014f

The government provides subsidies for Mozambique's road network and public transportation. Subsidies to the road fund were MZN 6,452 million (190 million USD) in 2014.Maputo and Beira public transportation together received MZN 238 million (7 million USD) in 2013 (GOM, 2014c).[18] As can be seen in Table 11, these costs are covered by a vehicles tax, a toll tax and a road tax, which in 2014 contributed MZN 8.3 million (245 thousand USD), MZN 68.6 million (2 million USD) and MZN 2 million (59 thousand USD), respectively (GOM, 2014f). The level of toll and road taxes varies depending on the type of bridge or road, and the vehicles tax varies according to vehicle type, engine size and age. With the inclusion of fuel tax revenues, these transport sector taxes represented 5 per cent of the country's total 2014 tax revenue and 43 per cent of environmental tax revenue.

Table 11: Revenue contribution of various transport sector taxes, millions MZN

Description	Revenue	Contribution to environmental tax revenues (in %)
Fuel taxes	6 841.7	42.8
Toll rates	68.6	0.4
Vehicle excise duty	8.3	0.1
Road taxes	2.0	0.01
Total	**6 920.53**	**43.3**

Source: GOM, 2014c; GOM, 2014f

GFR policy options

An important GFR policy option for the transport sector is to increase fuel taxes on more-polluting fuels. While Mozambique is in the top third of African countries in terms of the prices charged for fuels, the scope exists to increase prices on dirtier fuels, e.g. diesel, as prices for diesel are lower in Mozambique

[18] 2014 figures for public transport subsidies were not available.

(US$ 1.23 USD per litre) than in many of its neighbouring countries, such as the United Republic of Tanzania (US$ 1.27); Madagascar (US$1.27); Namibia (US$ 1.31); Zimbabwe (US$ 1.40); Zambia (US$ 1.48); Rwanda (US$ 1.73); and Malawi (US$ 1.90) (German Federal Enterprise for International Cooperation, 2014). Such measures would not only raise revenue, but would increase the rationale for behavioural changes and modal shifts towards cleaner fuels and low-carbon transport options. In addition, the government could consider increasing taxes and fees on larger vehicles and on less efficient engines (i.e. increase the gap in the present rates of taxation). Mauritius, for example, has eight different levels of vehicle registration fees for light-duty passenger vehicles, with a more than ten-fold difference in prices between those with the smallest and the largest engines (Mauritius, 2013). Ideally, fees would be based on vehicles' emissions intensity or fuel efficiency in order to more directly target the intended environmental externality, but such systems are relatively more complex to administer compared to fees based on engine size.

To anticipate growth in transport demand and vehicle ownership, one policy option is to phase out older vehicles from circulation, as they tend to use combustion technologies or engines that pollute more than more recent vehicles, and could cause road accidents due to malfunctioning. In Delhi (India) diesel cars over ten years old and gas-fuelled cars over 15-years old are banned from the streets to curb air pollution.[19] Similarly, in China small vehicles more than ten years old and medium or large size vehicles more than 15-years old must be removed from circulation (Government of China, 2012). In addition, China also offers subsidies when vehicles are scrapped one year or more before their mandated maximum age (Government of China, 2014). Rather than a phase-out, higher fees could be imposed on older vehicles when registering cars or when renewing vehicle licences. This measure could be implemented gradually, starting with taxis or commercial vehicles first, for instance, while a low-carbon public transport system is built up as an alternative to vehicle use.

Congestion charges in urban centres are another policy option and have been considered by the government in its green economy planning literature due to their potential to reduce air pollution (GOM, 2012a). However, congestion charges may be politically difficult to implement if fuel subsidies are being phased out at the same time. Congestion charges may be more appropriate over the longer term, i.e. once the fuel subsidy has been fully phased out and the public transport network is more fully developed and when real transport alternatives exist.

To ensure that air pollution does not significantly worsen, as has been the trend in growing urban centres in other countries, it is important that the government promote green modes of transport as the country continues to urbanize and grow. Promising transport options include the use of non-fossil modes of transportation, fuel switching, public transport, and more efficient fossil engines. One of the GFR policy options that could help generate improved environmental outcomes and shift behaviour and investment decisions is to ensure the full phase-out of fuel subsidies that is already underway, and to not reintroduce such subsidies in the future (e.g. when global oil prices start to increase). Undoing the government's policy of artificially lowering the price of fuels would encourage consumers to use these fuels more sparingly, as well as to purchase more efficient vehicles, and use alternative modes of transport, thereby helping to reduce GHG emissions and air pollution. The subsidy removal would also correct the contradictory state of affairs in which fuel is both taxed and subsidized by the government.

4.4 Water

Compared to countries in similar climatic zones, Mozambique is relatively well-endowed with water resources. The country has 104 main river basins, the most significant are the Zambezi and Royuma Rivers, which have a total catchment area of over 100,000 km^2. In all, Mozambique's renewable water resources are estimated at 12,000 m^3 per year, compared to a sub-Saharan average of 7,000m^3 (Dominguez-Torres & Briceno-Garmendia, 2011). Despite this relative abundance, many Mozambicans

[19] As reported widely in the India media. See, for instance, The Times of India, 7 April 2015, http://timesofindia.indiatimes.com/home/environment/pollution/National-Green-Tribunal-bans-diesel-vehicles-older-than-10-years-in-Delhi/articleshow/46838974.cms

have limited access to water services. Furthermore over half of the water the country receives is from watersheds that it shares with neighbouring countries, thus regional cooperation with Southern African Development Community (SADC) countries is vital to ensuring that water resource use is sustainable (GOM, 2012a).

Mozambique's geographically uneven distribution of rainfall and runoff, low water storage capacity, dependence on flow from upstream countries, and vulnerability to extreme weather events present important, interlinked challenges for water resource management, and underscores the vital importance of Integrated Water Resource Management (IWRM) at national and regional levels. To this end, the Ministry of Public Works and Housing (MOPH), which is responsible for water policies, has created a number of institutions, including five Regional Water Administrations (ARA); a number of Watershed Management Units (UGBs); a Water Regulatory Council (CRA), which regulates the water sector and protects consumers; and an Administration of Water Supply and Sanitation Infrastructure (AIAS), which oversees public infrastructure for water and sanitation services (GOM, 2012a). Notably, a dedicated Water Supply Investment and Asset Fund (FIPAG) was also established. In 2014, FIPAG had an operating budget of MZN 32.6 million (US$ 1 million). Of its total investment funds (MZN 1.8 billion in 2014, or US$ 53 million), 23 per cent was capitalized domestically, with the balance from external sources, such as the African Development Bank and the World Bank (GOM, 2014c).

However, despite these institutional developments, the water sector continues to face some significant challenges. In 2012, domestic water demand was expected to be 35 to 45 per cent higher than in 2003, while large industry demand was expected to be 60 to 70 per cent higher than in 2003 (Dominguez-Torres & Briceno-Garmendia, 2011). These demands are likely to grow with expected increases in population. Furthermore, as agriculture production is the dominant user of water, accounting for more than 95 per cent of total use, demand is also expected to increase significantly as planned irrigation projects come online (GOM, 2012a). The alteration of water flow patterns from planned hydropower production will compound demand-related challenges.

In addition to water resource management issues, Mozambique faces other challenges in its water network. In particular, service coverage is regionally uneven (as seen in Table 12), leading to water shortages during the dry season in rural areas; a large proportion of water points do not operate; and 40 per cent of water in the network is lost to leakage (GOM, 2012a).

Table 12: Water service coverage and availability in Mozambique

Province	Percentage	Availability (hours/day)
Xai-Xai	100	24
Chókwé	100	24
Inhambane	100	24
Maxixe	100	24
Beira/Dondo	90	24
Tete/Moatize	89	22
AO Manica	84	24
Pemba	73	18
Maputo/Matola	63	17
Quelimane	61	22
Nampula	50	12
Nacala	41	15
Lichinga	27	20
Angoche	25	23

Source: GOM, 2013b

Environmental challenges

Mozambique's wetlands and rivers are facing degradation and altered seasonal timing flows due to:

- Water abstraction and forest degradation in upstream watersheds;
- Inadequate land use planning and agreements; and
- Low capacity to monitor and enforce laws and regulations (USAID, 2013).

Compounding these challenges, climate change poses a major threat to Mozambique's water resources due to the associated increases in the frequency of extreme events, such as floods, droughts and cyclones (USAID, 2013). The specific and ultimate impacts of climate change on Mozambique's water resources are not yet clear, but climate models project a significant increase in inter-annual rainfall variability in the country, suggesting a likely increase in droughts (USAID, 2013).

The need for investment in improved water storage infrastructure is clear. This could both mitigate damage from floods during the rainy season and meet supply needs during the dry season, which could contribute to both poverty reduction and economic growth in the country. Given Mozambique's already significant challenges with water management (Bertelsmann Stiftung, 2014; GOM, 2012a) and the challenges of heavy upstream use, poor management, and climate change, improving storage, conserving water and using water more efficiently will become increasingly important as the country tries to meet its future water needs.

Current GFR policies

Collecting fees for the provision and use of water is considered an important part of GFR policy-making because it signals to users that they are consuming a scarce resource and that they should limit their use to an economically efficient level. Mozambique recovers the costs of its public water utilities through a system of user fees. As seen in Table 13 (GOM, 2014c; GOM, 2014f; Water Regulatory Council, 2012), there is a fixed fee which is independent of consumption, as well as a fee that varies with consumption volume and consumer type. This type of volumetric pricing is an important GFR policy feature because it taxes heavy use more than moderate use, creating price incentives to limit consumption of water that goes beyond basic needs.

Table 13: Water tariff structure, millions MZN

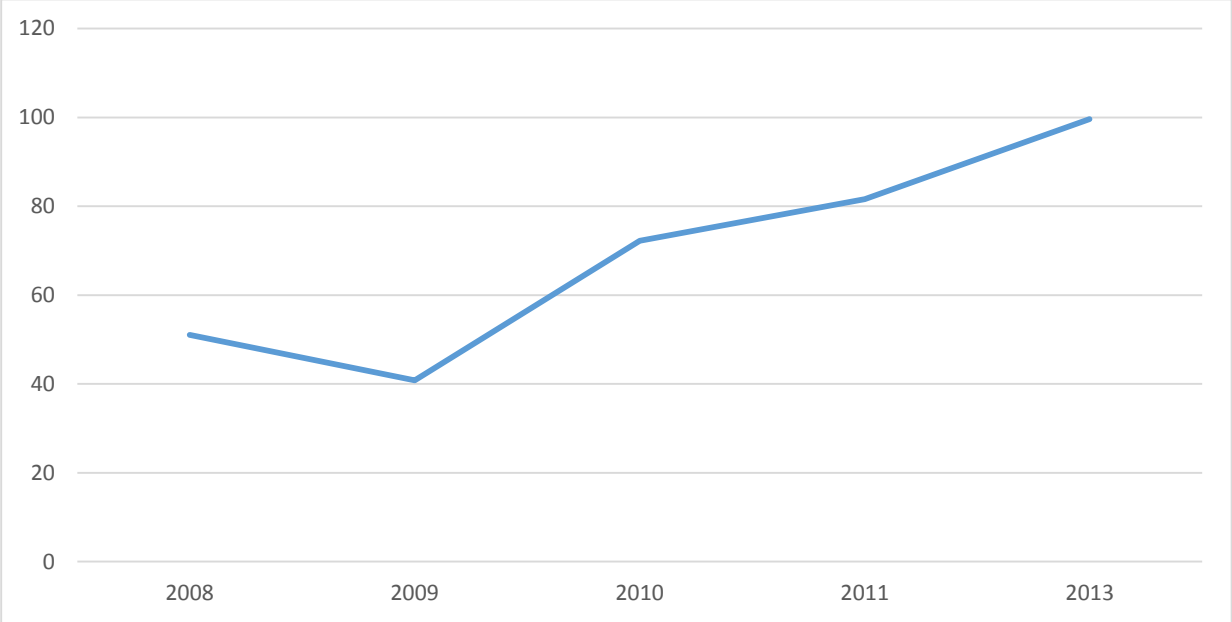
Systems	Fountains	Domestic				Municipalities	General (Commerce, Public, Industry)		
		Fixed Rate	Level 1	Level 2	Level 3		Level 1		Level 2
			Up to 5m³	5 to 10m³	Over 10 m³		Commerce - Up to 25m³/month	Industry - up to 50m³/month	50m³/month
	MT/m³	MT/month	MT/m³	MT/m³	MT/m³	MT/m³	MT/month	MT/month	MT/m³
Maputo, Matola e Boane	10.00	60.00	73.00	19.00	28.30	14.60	712.50	1.425.00	28.50
Chókwé Cidade e Distrito	10.00	55.00	50.00	14.00	22.00	10.00	575.00	1.150.00	23.00
Xai - Xai	10.00	55.00	50.00	14.50	22.00	10.00	575.00	1.150.00	23.00
Inhambane	10.00	55.00	55.00	16.50	22.00	11.00	575.00	1.150.00	23.00
Maxixe	10.00	55.00	70.00	18.00	23.50	14.00	600.00	1.200.00	24.00
Beira, Dondo e Mafambisse	10.00	55.00	70.00	19.00	23.50	14.00	575.00	1.150.00	23.00
Chimoio	10.00	55.00	50.00	15.50	18.50	10.00	573.50	1.075.00	21.50
Manica	10.00	55.00	50.00	15.50	18.50	10.00	537.50	1.075.00	21.50
Gondola	10.00	55.00	50.00	15.50	18.50	10.00	537.50	1.075.00	21.50
Tete	10.00	55.00	50.00	15.50	18.50	10.00	537.50	1.075.00	21.50
Moatize	10.00	55.00	50.00	15.50	18.50	10.00	537.50	1.075.00	21.50
Quelimane, Nicoadala	10.00	55.00	70.00	19.00	22.20	14.00	575.00	1.150.00	23.00
Nampula	10.00	55.00	70.00	19.00	22.50	14.00	575.00	1.150.00	23.00
Nacala	10.00	55.00	50.00	15.50	18.50	10.00	537.50	1.075.00	21.50
Angoche	10.00	55.00	50.00	15.50	18.50	10.00	537.50	1.075.00	21.50
Pemba,Murrébué,Metuge	10.00	55.00	70.00	19.00	23.50	14.00	612.50	1.225.00	24.50
Lichinga	10.00	55.00	50.00	15.50	18.50	10.00	537.50	1.075.00	21.50
Cuamba	10.00	55.00	50.00	15.50	18.50	10.00	537.50	1.075.00	21.50

Source: Water Regulatory Council, 2012

Other taxes and fees are also in place in the sector, including a tax on raw water sales, which is a variable tax set at 40 MZN/m³ for water destined for agriculture and 70 MZN/m³ for water destined for other uses (GOM, 2012f). There are also fixed taxes on water licences and concessions granted by the government and fixed taxes on income that licensees generate from the sale or leasing of their concessions. There is also an effluent discharge tax, but little information was available on effluent levels nor on who is targeted by this tax.

These various taxes and charges for the use of raw water represent important GFR policies because they charge users for the use of natural resources, an important GFR principle. However, it was not possible to find associated revenue for all these various taxes in the 2014 budget (GOM, 2014f), and it is not clear whether these charges are being accounted for elsewhere or whether no associated revenue was generated or collected. In 2013, the tax on raw water sales generated MZN 100 million (US$ 3 million) in revenue, but other water sector charges appeared with zero revenue. The revenue (if any) that some of the sector's taxes and charges are in fact generating is therefore not very clear. However, historical revenue streams from the water sector indicate at least a general upward trend between 2008 and 2013, as summarized in Figure 16.

Figure 16: Revenue from the water sector taxes and fees, MZN millions



**Figures were not available for 2012*
Source: GOM, 2014c

In terms of capital expenditure in the sector, the country has a Water Supply Investment and Assets Fund, the goals of which are to:

- Act, on behalf of the state, as the main interlocutor between the state and the private operator;
- Manage the public investment programme on the water supply system; and
- Delegate the exploitation and management of the public goods in the water sector to the private sector, and performing its monitoring and supervision;

Public goods in the sector are considered to be "public domain assets allocated to the water supply system" which would include water storage infrastructure (Water Supply Investment and Assets Fund, 2014). Given the acknowledged importance of the country's future storage capacity, evaluation of the value-for-money being realized in expenditures of the fund warrant closer examination. In addition, the Strategic Plan for Development of the Agricultural Sector notably includes an allocation of MZN 241 million (US$ 7 million) to a drought mitigation programme for budget year 2014, but the funds went unspent for reasons that are not clear from available documentation (GOM, 2014c).

On the subsidies side, Water Aid reports that there has been a gradual decline in subsidies to the water sector (Water Aid, 2010), and public expenditure related to the operational costs of the Water and Sanitation Infrastructure Administration, South Waters Regional Administration, and the Water Regulatory Council fell from MZN 40 million (1.2 million USD) in 2013 to a planned MZN 34.6 million (1 million USD) in 2014 (GOM, 2014c; GOM, 2014f). Overall, however, it is unclear whether recovery of these subsidies has been achieved through taxes and charges in the water sector and to what degree. This represents an important subject for subsequent research.[20]

GFR policy options

The government recognizes the need to convey the true cost of water to consumers via the price mechanism in order to signal its scarcity, and calls for "pricing, cost recovery and incentives to reduce 'unaccounted for water' and inefficiencies," and "the integration of considerations of environmental hydrological service flows (e-flows) in water pollution and consumption payments" (GOM, 2012a). Such pricing mechanisms can generate additional revenues which could be used to invest in important green economy infrastructure for the sector, such as improved water storage capacity.

Despite various taxes and charges currently applied on water use, certain types of water consumption go uncharged as some industrial actors in sectors, such as agriculture, energy and mineral resource production, do not pay for the water they abstract from waterways due to various exemptions and loopholes. Therefore, one GFR policy option which could help conserve water and ensure more efficient use would be to institute charges on industrial actors that presently do not pay any type of compensation for their water use. To begin with, such charges could be introduced at a low level often as a means to raise awareness and help to overcome potential resistance. These charges could be increased over time to reflect full environmental costs in the long term.

In addition, the production processes of industrial actors often involve discharge of effluent into waterways, and while there is an effluent discharge tax in place, the government's budget documents do not record any associated revenue with this tax (GOM, 2014c). Therefore, an additional important GFR policy option is to charge all industrial sectors for their effluent discharge in order to recoup the costs of the associated pollution and its impact on human health and ecosystem services, which can affect not only waterways but entire river basins. Monitoring and enforcement efforts to support these efforts would also be required. Waterworks companies bear some of the clean-up costs of the pollution and are often politically powerful, thus cooperation between these companies and government monitoring and enforcement officials can be useful.

4.5 Fisheries

Mozambique's coastal fisheries are of critical importance to the food security and income of the population. The sector accounts for about 2 per cent of GDP and 8 per cent of exports (GOM, 2012a; Olund Wingqvist, 2011). It employs 350,000 artisanal fishers, as well as some industrial and semi-industrial operators (GOM, 2012a). The most important commercial species include crustaceans (mostly shrimp) and tuna (GOM, 2012a). Tables 14 and 15 show catches and growth rates for industrial and semi-industrial as well as craft fishing, and give an idea of some of the stock dynamics at play in the country's fisheries.

[20] In addition, the question of whether water licences and concessions are in line with sustainable use, and whether charges are properly calibrated in order to reflect the combined opportunity cost of water and the environmental costs of its use is also unclear, and merits closer scrutiny.

Table 14: Annual growth rates and total catch for industrial and semi-industrial fishing

Description	2011		2012		2013	
	Annual growth (in %)	Tons	Annual growth (in %)	Tons	Annual growth (in %)	Tons
Crustaceans	-13	6 339	-24.4	4 790	3.6	4 963
Prawns	-18	4 620	-45.5	2 518	-3.7	2 425
Deep water prawns	2	1 288	47.4	1 899	-7	1 767
Crayfish	54	145	-10.3	130	-2.3	127
Lobster	108	204	-5.9	192	199	574
Crab	-61	82	-37.8	51	37.3	70
Deep sea fish	-26	1 252	402	6 285	-74.1	1 629
Tuna fish	-11	5 924	…	..	..	3 768
Fresh water fish (kapenta)	36	18 330	-25.2	13 707	21.4	16 645
Squiland/Octopus	16	103	11.7	115	248.7	401
Accompanying Fauna	25	1 113	54.8	1 723	11	1 912

Source: GOM, 2010b

Table 15: Annual growth rates and total catch for craft fishing

Description	2012		2013	
	Annual growth (in %)	Tons	Annual growth (in %)	Tons
Lobster	7	225	-28	162
Pelagic crab	6	1 350	4	1 399
Marine fish	16	115 269	-1	114 549
Fish from inland waters	-3	53 514	22	65 285
Prawns	81	3 360	-8	3 079
Acetes	-13	2 016	21	2 431
Coastal cephaloods	61	2 035	-18	1 672
Shark	13	489	53	747
Others	326	4 816	-4	4 631
Wildlife companion	-8	3 139	6	3 319

Source: GOM, 2010b

The government recognizes aquaculture as an important potential contributor to food security and job creation, but this sector has not been widely developed as yet. Mozambique has the potential for more than 250,000 ha of freshwater aquaculture and 30,000 hectares of marine aquaculture, but only 5 per cent of this capacity is currently utilized (GOM, 2012a). Table 16 summarizes current trends in aquaculture production.

Table 16: Aquaculture production

Description	2011		2012		2013	
	Annual growth (in %)	Tons	Annual growth (in %)	Tons	Annual growth (in %)	Tons
Prawn*	-24	506	-92.5	38	-73.7	10
Fish	60	284	99.3	566	25.6	711

**The strong negative decline in prawn aquaculture is attributable to the outbreak of White Spot Syndrome in the country's prawn aquaculture fishery*
Source: GOM, 2010b

Given the critical importance of fisheries to food security and livelihoods in Mozambique, the productivity of the sector is an important concern. Increased productivity will require both investments in infrastructure and processing facilities and measures to ensure sustainability (GOM, 2012a). The government has started acting to respond to these needs. Mozambique is party to regional and international protocols for marine monitoring, control and surveillance, such as the United Nations Convention on the Law of the Sea (UNCLOS), the SADC Fisheries Protocol, and is a member of the Indian Ocean Tuna Commission (IOTC) and the South West Indian Ocean Fisheries Commission (SWIOFC). At the national level, the government has developed a policy and strategy for monitoring, control and surveillance, and a national plan against illegal, unreported and unregulated fishing (GOM, 2010b). Moreover, as part of its Green Economy Action Plan, the government will explore a rights-based approach to fisheries management, including potentially giving ownership of the sustainable management of fishery resources to local communities (GOM, 2012a). It has also established a Marine Protected Area of the Primeiras and Segundas Islands, along the coast of Zambezia and Nampula (GOM, 2012a).

Environmental challenges

The sustainability of the country's fish stocks is the most pressing environmental concern in the sector. Mozambique's shallow waters are under heavy fishing pressure, and continued exploitation by the artisanal sector is rapidly leading to overfishing (GOM, 2012a). A recent study on the state of the various artisanal fisheries in two southern provinces of Gaza and Inhambane (Pereira et al., 2009) has shown a declining trend in the majority of fisheries, and this trend extends to most other fisheries (especially the shallow-water shrimp fishery) and provinces in the country (USAID, 2013). In addition to overfishing, Mozambique's marine fisheries are also threatened by habitat degradation, pollution and natural disasters. The frequency of natural disasters is expected to increase as a result of climate change (Olund Wingqvist, 2011).

Different fisheries are threatened in different ways. Coral reef and near-shore fisheries, which support about 6.6 million people in 48 coastal districts, are under threat from damaging fishing practices associated with heavy subsistence fishing (e.g. dynamite, poison, small-mesh nets, beach seining), from overfishing of keystone reef species. They are also threatened by the effects of coral bleaching, which is being caused by climate change impacts, such as warming ocean temperatures and in particular, ocean acidification (USAID, 2013). Offshore fisheries, on the other hand, are mainly threatened by the overharvesting of tuna and other commercially valuable species, and by illegal (as well as legal but unregulated) deep-sea fishing, mainly by foreign fleets (USAID, 2013). However, despite the different nature of the threats that each type of fishery activity faces, the lack of sufficient enforcement systems and capacity (boats, fuel, patrol staff) on the part of marine resource management agencies has been identified as a contributing cause to the challenges being experienced in both types of fisheries (USAID, 2013). Finally, inland fisheries also face challenges related to unsustainable fishing techniques but addressing this topic is beyond the scope of this current study, which is focused more on the country's major coastal fisheries.

Current GFR policies

In its green economy planning, the government recognizes that in order to foster a green fisheries sector, it will need to:

- recognize that the ocean has a limit in terms of the fish it can provide;
- recognize the need for restocking overfished or destroyed fish stocks;
- protect and preserve essential marine habitats; and
- reduce pollution and GHG emissions (GOM, 2012a).

With respect to GFR-relevant policies in place in the sector, the government collects funds from fishing and maritime activity licences, which in 2014 generated MZN 67 million (US$ 2 million) and MZN 36 million (US$ 1.1 million), respectively (GOM, 2014f). Fishing licence costs in the country are as follows (GOM, 2014f). [21]

- Surface water fishing:
  - Nationals – MZN 400,000 (US$ 12,000)
  - Foreigners - MZN 800,000 (US$ 24,000)
- Deepwater Fishing:
  - Nationals - MZN 500,000 (US$ 15,000)
  - Foreigners - MZN 1,000,000 (US$ 30,000)

Funds are also collected for a Fishing Development Fund, which amounted to MZN 56 million (1.7 million USD) in 2014 (GOM, 2014f), but the means by which this revenue is collected is not clear from the country's national budgets. Altogether, the revenue from fishing licences and the revenue collected for the Fishing Development Fund totalled MZN 159 million (US$ 4.7 million) in 2014, and amounted to 0.13 per cent of total 2014 government tax revenue, or 1 per cent of environmental tax revenue.

The government provides support to the aquaculture sector through the National Institute of Aquaculture Development and a Fishing Foment Fund, which aims to financially support actions intended to stimulate private investment to achieve policy goals in the fisheries sector (Fishing Foment Fund, 2014). The tasks undertaken include the following, and would warrant analysis in terms of their impact on green economy goals and objectives:

- Support artisanal fishing;
- Support industrial fishing of not yet exploited resources or in new fishing areas;
- Renovation and expansion of the semi-industrial fleet;
- Financially support the actions, programmes and projects of investigation, experimentation, inspection and expansion of fishing institutions that are independent of the Ministry of Fishing.

GFR policy options

There are a number of GFR policy options available for both protecting and improving the health of fisheries. One immediate GFR policy option is to review fishing licence fees to determine whether they should be raised to account for the environmental externality being experienced in the sector, namely, stock decline and possible collapse associated with overfishing. Also, given that offshore fishing of important commercial species is being driven by foreign rather than domestic fleets (USAID, 2013), there may also be a case for increasing the difference between licence fees for foreign versus domestic vessels in order to both raise revenues and protect offshore stocks. Box 3 provides an overview of best practices in fisheries management.

An important and related GFR policy measure available to the government is greater monitoring and enforcement, as well as potentially charging higher fines. The benefit of these measures is to ensure that activities in the sector align with environmental and fishing licence restrictions and sends an important signal that such limits will be taken seriously, while also creating revenue from penalties and charges. An increase in capacity for marine fisheries surveillance to support monitoring and enforcement efforts is identified as a key entry point for the sector in the government's green economy strategy (GOM, 2012a). Greater monitoring and enforcement would also facilitate the legitimization of the informal part of the sector since large portions of the domestic, community-level sector are currently untaxed,

[21] No details were available for the breakdown of maritime activity licences costs.

representing significant unrealized tax revenue. Monitoring and enforcement of existing regulations and taxes could generate greater tax and licence revenue from the sector, as well as facilitate better monitoring of its total catch and environmental impacts.

Box 3: Best practices for fisheries management and the "blue economy" transition

Marine capture fisheries contribute over US$ 270 billion to global GDP, provide livelihoods for 300 million people, and nourish the 3 billion people whose primary source of protein is fish. Recent research shows that a "blue economy" with enhanced fisheries governance and reformed management practices can create substantial economic growth while also increasing food production, replenishing fish stocks, and improving overall marine ecosystem health. Improved fisheries management includes not only measures to prevent overfishing, but also mechanisms to reduce fishing pressure when stocks become depleted. Best practices include robust evaluation of fish stocks, well-designed management schemes to limit unnecessary fish mortality, and stringent regulations to reduce overharvesting and illegal fishing. Bycatch regulations, limits on days at sea, gear restrictions and mandated reporting are all effective policy tools but will vary in appropriateness depending on the context. There are, however, substantial upfront costs; better management necessitates investment in continued scientific research, more effective monitoring systems, and schemes to encourage private sector participation. The upside is that these costs will be recovered in the form of poverty reduction, food production and improved biodiversity. The average benefit-cost ratio for investments in fisheries management reform is 10:1.

Scientists and economists from the University of California Santa Barbara, Environmental Defense Fund and the University of Washington have developed an upside bio-economic model that offers an alternative view to the generally bleak outlook on fisheries. They estimate that given adequate investment, sustainably managed fisheries could yield 23 per cent greater harvests per year, 315 per cent more profits annually, and 112 per cent more fish biomass in the long-term compared to a 'business as usual' scenario. More importantly, they contend that significant achievements can be made in the short-term; a typical fishery could potentially recover in just nine years, and 98 per cent of fisheries could reach biologically healthy levels by 2050. These economic improvements are contingent on institutional reform, e.g. incorporating cooperatives, territorial user rights, or individual transferrable quotas into management regimes. Rights-based approaches offer immediate economic gains that can be used to offset higher costs associated with more sustainable practices. Adopting effective catch shares is perceived as the best choice for improving management; although this entails the largest incremental increases in management cost, it also contributes to greater increases in economic rent. Alternatively, strong output controls are also potentially beneficial. Although they may entail lower management costs relative to catch shares, they are not believed to offer the same long-term profitability.

The need for better management extends to inland fisheries as well. In the Amazon River Basin in Brazil, efforts to protect fish stocks have included prohibiting certain types of fishing gear, limiting fishing seasons, restricting access to fisheries and decreasing the number of fishing licences allocated. Furthermore, fishing accords and their recognition by government agencies have contributed to the decentralization of fisheries management and the institutionalization of participatory approaches. In a similar attempt to improve community participation in Lake Victoria, Africa, co-management systems referred to as beach management units have been successfully utilized to include local stakeholders in the decision-making processes and enforcement of fisheries. Additionally, eutrophication and wastewater discharge issues have meant that improving Lake Victoria's water quality is no less important than reforming its fishing practices; managing pollution is a critical component of fisheries management. In Cambodia's Great Lake system, effective monitoring of total annual catch, biomass, mean weight, and population size (age) structure have been key instruments in the regulation of the Tonle Sap stationary trawl fishery, which contributes heavily to Cambodia's economy and food security. In addition to being the most thoroughly monitored inland fishery in South-East Asia, management interventions have been implemented in response to the threat of overfishing. These include auctioning a finite number of licences for exclusive exploitation, moratoriums during spawning periods, and technical limitations on fishing gear. Despite these success stories, the management of inland fisheries remains extremely difficult due to spatially dispersed fish stocks, large number of stakeholders, distance from urban centres, and lack of enforcement capacity.

1. California Environmental Associates, et al. (2015). *Ocean Prosperity Roadmap: Fisheries and Beyond – Synthesis Report*.
2. FAO. (2014). *Inland Fisheries Evolution and Management: Case Studies from Four Continents.*

However, it is also important to note that a significant portion of the informal part of the sector is subsistence or artisanal, policy-making should therefore aim to balance the needs of these marginal

populations with the green economy priorities for the sector. Indeed, these populations are often forced to over-exploit fisheries due to lack of alternative livelihoods, and thus support for alternative livelihoods or aid in transitioning to catch of less vulnerable species can help to limit over-fishing by artisanal operators and deter off-licence fishing. Expanding aquaculture, if done in an environmental balanced way, could also be a viable way of both reducing stress of key fishery species and providing alternative livelihoods.

4.6 Forestry

Half of Mozambique's terrain, approximately 40 million hectares, is forested. Forests are an important source of livelihoods in the country, producing timber and non-timber products, half of the country's forests are classified as production forests. Beyond this naturally forested land, approximately 7 million hectares of land are suitable for forest plantations, but only 67,000 hectares of this are currently operational. The country's forests are also an important component of its natural capital, providing essential ecosystem services, controlling watershed runoff and sedimentation and sequestering carbon in their biomass (GOM, 2012a). Mangrove forests are a particularly important ecosystem service provider. They build up coastlines as their extensive root systems slow water flow and trap sediment, and also protect coasts from winds, waves, tides and storm surges.

As in the fisheries sector, sustainable management of forest resources is essential. However, the government has insufficient capacity to monitor and enforce forestry regulations and licences, especially when the economic scale and geographical size of the forestry sector are taken into account. There are also fiscal management challenges, as logging fees are not proportional to the value of timber, and forests' non-timber products and ecosystem service values are not accounted for in the setting of fees (GOM, 2012a). Hence, the full value of forestry resources is rarely being realized, and off- or above-licence logging is extensively practiced.

Environmental challenges

Deforestation is the main environmental challenge in the sector, driven by illegal logging, unsustainable production of charcoal and land clearing for resource extraction and production of cash crops. Deforestation rates vary among provinces but are highest in Nampula, at 1.16 per cent per year (GOM, 2012a). Different forest types face different threats in the country. In Miombo woodlands and the country's coastal forests, logging (both permitted and illegal) of high-value species is the main driver of deforestation, while in Mopane woodlands and the country's savannas, the main drivers are primarily agriculture, mining and associated development (e.g. coal strip mining in Tete Province). The drivers of these threats are also distinct. Miombo woodlands and deforestation of coastal forests can be attributed to a weak capacity to monitor and enforce existing regulations, while the deforestation of Mopane woodlands and savannas is driven by inadequate land-use planning and agreements, unclear, insecure and/or overlapping land and resource tenure, and corruption (USAID, 2013).

Mangrove forests are also experiencing deforestation. Mangroves provide a multitude of uses to local communities, including poles for home and boat construction, fencing, firewood, fish traps and medicines. But unregulated mangrove cutting is prevalent throughout Mozambique and is causing coastal erosion and sea-level rise, creating significant socioeconomic and environmental problems (USAID, 2013). For example, in Ilha dos Búzios the mangrove belt was completely removed and 100 families had to be relocated due to sea-level rise. Similar cases have been observed in Maputo and Beira, where coastal erosion has seriously threatened infrastructure and the physical and ecological integrity of ecosystems. Mangrove deforestation has been attributed to inadequate coastal zone management, inappropriate planning and agreements and a low capacity to monitor and enforce laws and regulations (USAID, 2013).

Current GFR policies

The government recognizes the need to manage the nation's forests more sustainably. Progress in forest management practices has been achieved through the implementation of Reducing Emissions from Deforestation and Forest Degradation (REDD+) initiatives. One such initiative was put in place for

2009-2012 with Brazilian support, while a second initiative is currently underway to test the efficiency of REDD+ in Mozambique, the latter project is funded by the Norwegian Embassy. The Brazilian project, primarily based on knowledge-sharing and best practices of REDD+ management, was a necessary condition for Mozambique to receive a US$ 3.8 million grant in March 2012 from the Forest Carbon Partnership Facility (FCPF), which provides countries with a wide variety of tools, e.g. financial, technical, knowledge-based, performance evaluation, to implement REDD+ properly and ensure transparency (International Institute for Environment and Development, 2013).

Current efforts to certify logging companies by the Forest Stewardship Council (FSC) may also help to change practices in the formal parts of the sector. The FSC is an international best-practices certification that ensures that forest exploitation is conducted in a way that is conscious of its potential impacts on societies and the environment, with membership that includes environmental non-governmental organizations (NGOs), forestry businesses and local civil society organizations (CSOs) (Forest Stewardship Council, 2015).

In addition, the government is considering a transition from a 'single licence' approach to multipurpose concessions over a longer time horizon, coupled with improved law enforcement and land tenure for local communities and a landscape approach to forest management (GOM, 2012a). Improving the benefits for local communities is a key factor. At a national green economy workshop organized by the government in April 2015, stakeholders noted that communities receive very little funds, despite being entitled to 20 per cent of the income from commercial exploitation of their forest resources.

In terms of existing GFR policies, a significant amount of relevant taxes and fees are in place in the forestry sector and are summarized in Table 17. Notably, despite the significant amount of illegal logging identified above, the fines imposed on the logging industry are a relatively small revenue generator, delivering only MZN 55 million (US$ 1.6 million) in 2014, or less than 10 per cent of the tax and charge revenue from the sector.

Table 17: Forestry sector tax and fee revenue, MZN millions

Description	Revenue	Contribution to environmental tax revenues (in %)
Charcoal and timber excise duty	181.41	1.1
Tax on timber exports	140.00	0.9
Logging fee	125.24	0.8
Timber certificate	55.51	0.3
Timber selling fee	47.14	0.3
Logging industry fines	37.90	0.2
Reforestation tax	0.77	0.005
Total	**587.98**	**3.7**

Source: GOM, 2014c; GOM, 2014f

As Table 17 shows, these various charges and fees together generated MZN 588 million (US$ 17.9 million) in revenue, amounting to 0.46 per cent of 2014 government tax revenue, or 3.7 per cent of environmental tax revenue (GOM, 2014c; GOM, 2014f).

GFR policy options

As outlined in section 3.3.6, deforestation is the primary environmental challenge facing the forestry sector. As noted above, a large share of this deforestation is being driven by unregulated and/or illegal activity in the sector. A key policy option therefore is to increase monitoring and enforcement capacity to better ensure conformity with forestry regulation and licences, as well as raise revenue from penalties. Box 4 provides some examples of best practices in monitoring and enforcement. A review of penalty levels could also be considered, as they currently do not seem to be a deterrent to deforestation. If need

be, the penalties could be raised, as this could not only increase revenue, but also send an important signal that off-licence logging is taken seriously by the government, helping deter such activity.

In addition to monitoring and enforcement, strong policy and enforcement on corruption in the forest sector is urgently needed as corruption in the forestry sector is widespread and often involves key government officers (Transparency International, 2014). Government corruption related to illegal timber exploration in the country will continue to accelerate deforestation, increase risks of food insecurity, poverty and worsening climate change-related impacts if appropriate measures are not taken soon.

Box 4: Best practices for improving monitoring and enforcement of ecosystem services protection

In Ecuador, the Fundación Cordillera Tropical (FCT) has developed a payment for the protection of ecosystem services (PPES) programme targeted at water resources and wildlife in the Sangay National Park. The programme rewards landowners who protect areas of tropical montane forests and páramo grasslands from the expansion of agricultural and infrastructural development. The FCT has collaborated with the University of Wisconsin-Madison to develop long-term monitoring strategies for the PPES programme. They sought to engage the community in the monitoring process by training its members as parabiologists who actively engage in monitoring and serve as liaisons between their communities and national park officials. These community monitors use GPS technology to maintain high quality records of their surveillance patrols. It is hoped that they will eventually become leaders in national park management and biodiversity monitoring. Also, monetary incentives for conservation were coupled with community engagement efforts, such as workshops intended to educate landowners on the value of biodiversity and to transfer relevant technical skills. The combination of external technical knowledge with local expertise is critical to maintaining the monitoring and enforcement capacities of this programme.

There is now a growing trend of using geographic information systems (GIS), satellite imaging, and light detection and ranging (LIDAR) technologies to remotely monitor natural resources. In regard to the latter, aircraft using GPS-enabled rapid pulsing laser scanners can quickly and accurately create surface maps of expansive areas. This commercially available technology can be used to map topography, forest canopies and riparian vegetation. In a consultation on how to improve payments for ecosystem services connected to conservation agriculture in Kenya, the FAO recommends the use of remote imaging and GIS to monitor tillage, crop retention and soil structure; this data will then be periodically verified by ground truthing using a land degradation surveillance framework. Monitoring cropping patterns, management, development and yields by means of GIS technology will greatly reduce the management, reporting and verification costs, while also improving the effectiveness of enforcement and providing real time accountability between the buyers and sellers of ecosystem services.

1. FAO. (2013). *Adding Value to Smallholder Farmers Practicing Conservation Agriculture Through PES in Kenya*.
2. Renslow, M., et al. (2000). *Evaluation of Multi-Return LIDAR for Forestry Applications. United States Forest Service*.
3. Treves, A. & Schloegel, C. (2010). *Monitoring and Enforcing Payment for Ecosystem Services Programs: Lessons Learned*. USAID.

As stakeholders noted in the national validation workshop, communities are sometimes drivers of deforestation as lack of livelihood alternatives force them to abusively fell trees for their timber. Support for alternative livelihoods for local communities will therefore form an important part of the solution to Mozambique's deforestation problem. Another driver of deforestation is clearing of land for energy and mineral resource production and for agriculture. Land-use taxes and charges could therefore be charged for activities that involve the clearing of land, but sufficient monitoring and enforcement is needed to ensure this measure has an optimal impact. In particular, extractive industry development and its impact on forest cover has been identified as a major emerging driver of habitat loss in the country (USAID, 2013), and given the expected growth in extractive activities, this is an important concern. As shown in the mineral resources subsection above, the mining industry already pays a surface tax based on the scale of the land area disturbed, this tax could be reviewed to determine whether it is set at a level which provides a meaningful incentive for companies to minimize the geographic footprint of their operations, particularly as some production techniques can involve more land disruption than others.

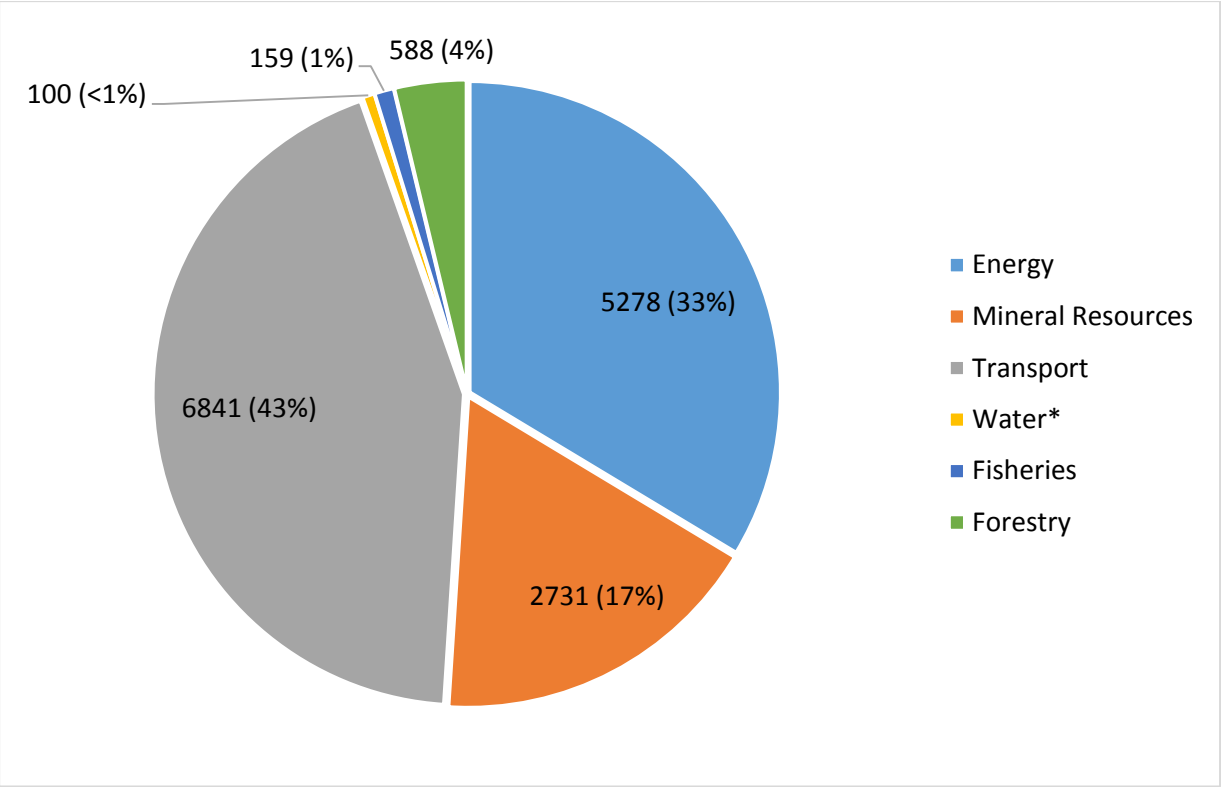
Finally, there is also the policy option of scaling up forestry licence costs in order to account for forests' valuable role in nutrient cycling, habitat provision and other important ecological services. However, such a policy would need to be accompanied by improved monitoring since it may encourage illegal logging. A payment for ecosystem service (PES) approach to forestry could draw on the Mexican experience, which pays landowners to refrain from felling trees, as well as the Costa Rica experience, where farmers are paid for not deforesting. In Madagascar, an internationally-designed PES scheme has had limited success due to the complexities of integrating it with the country's broader conservation strategy (Brimont & Karsenty, 2015). As stated above, the government's Multi-Sectoral Platform for a green economy endeavours to define the monetary and non-monetary values of the principal ecosystem services (GOM, 2012b), which could greatly support a PES scheme in the forestry, as well as in other sectors.

5. Conclusion

Mozambique faces a range of environmental challenges and risks which could all be compounded by climate change and a growing population. These challenges and risks include: deforestation; declining fish stocks; land, water and air pollution; and loss and degradation in wetlands and rivers. The government has articulated a green economy vision of becoming "an inclusive middle-income country by 2030, based on protection, restoration and rational use of natural capital and its ecosystem services to guarantee development that is sustainable, inclusive and efficient, within the planetary limits". To realize this vision, there are a number of important GFR policies that the government could pursue that could help transform key economic sectors into low-carbon, sustainable sectors, which could incentivize green investment and create a fiscal space for environmental, social and development priorities.

The government already recognises the value of GFR policies and the importance of using taxes to "change consumer preference and promote green investment and innovation", as well as the importance of adopting a legal and institutional framework to facilitate this" (GOM, 2012a). As illustrated above, Mozambique already has a fairly well-developed system of taxes and fees that achieve environmental objectives and help foster needed shifts in behaviour and investment decisions. Together, these taxes and charges generated MZN 16 billion (US$ 470 million) of revenue in 2014, or 12.6 per cent of total tax revenue. Fuel taxes are the most important revenue generator, accounting for 43 per cent of total environmental taxes and charges. Other important revenue sources include income taxes in the extractive sectors, logging fees and royalties and surfaces taxes. The contribution of sectoral taxes and charges toward total environmental tax revenue is summarized in Figure 17.

Figure 17: Sectoral contribution to total 2014 environmental tax revenue, MZN millions and percentage share of total



** Due to lack of available data for 2014, revenue from the water sector uses 2013 figures*
Source: GOM, 2014c

This report has analysed the country's environmental challenges, existing GFR policies and proposed a number of policy options that could help facilitate Mozambique's green economy transformation in different sectors as summarised below and in Table 19.

Energy

In the energy sector, pricing carbon emissions and land, water and air pollution associated with energy production could help the government to recoup some of the environmental costs associated with the energy sector's activities and incentivize producers to minimize their environmental impacts. In addition, removing price supports for small-scale diesel generators could help create a level playing field for solar PV generation which can provide a source of electricity for the majority of Mozambique's citizens that are currently off-grid consumers.

Mineral Resources

In the mineral resources sector, there is a need to develop better contract and licence terms with foreign companies and review, and possibly scale back or eliminate, the numerous tax rebates for megaprojects. Doing so would help offset the long-term environmental and clean-up costs that are often borne by the government and would also ensure that mining operations are of net economic benefit to the country. An additional important GFR policy is to increase monitoring and enforcement in the mining sector to ensure that environmental regulations are adhered to. Lastly, it is worth taking measures to formalize the significant informal and artisanal portion of the sector in order to regulate unsustainable resource use, curb pollution and generate revenues.

Transport

To limit urban air pollution and the transport sector's GHG emissions, taxes on more-polluting fuels and older, less efficient vehicles could be raised relative to cleaner alternatives. In addition, the phase-out of fuel subsidies could be completed. Congestion charges could also be considered over the longer term, once better public transport alternatives are available.

Water

In order to facilitate conservation and efficient use of water resources, the government could begin to institute charges for users in the energy, mineral resources and agriculture sectors which are currently not charged for their water abstraction. Also, mechanisms for collecting for the effluent discharge fee could be strengthened, as currently there does not seem to be clear enforcement of the fee nor information about the revenue it generates.

Fisheries

The fisheries sector faces major sustainability concerns due to overfishing and off-licence activity. To combat this trend, the government could review fishing licence fees to assess whether they are high enough to price in the environmental externality of declining stocks and overfishing. Improved monitoring and enforcement, as well as potentially raising fines, are other promising GFR measures that could help limit the scale of illegal fishing and act as a deterrent.

Forestry

Finally, to combat troubling deforestation trends, the government could increase efforts to address corruption, increase monitoring and enforcement capacity in the forestry sector, and consider raising penalties for illegal logging. In addition, charges could be applied on individuals or companies that clear forest land. This is especially important in extractive sectors, which represent a major emerging driver of habitat loss in the country. Mining companies are already subject to a surfaces tax, this tax could be reviewed to ensure it is high enough to incentivize operators in the extractive sector to minimize the geographical footprint of their activities. Finally, forest licence costs could be raised to account for forests' valuable role in ecosystem service provision.

Overall, Mozambique has a robust system of environmental taxes and levies, and a well-articulated green economy strategy.[22] By leveraging some of the GFR policy options available, the country would be well-positioned to realize its green economy goals by encouraging behaviour and investment to be more in line with green economy principles, while at the same time strengthening the government's fiscal position.

[22] The country's environmental challenges, existing GFR policies and GFR policy options are summarized in Table 18.

Table 18: Environmental challenges, existing GFR policies, and GFR policy options in Mozambique

Sector	Environmental challenges	Current GFR Policy	GFR Policy Options
Energy	• Land, water and air pollution from oil and gas extraction • Clearing of virgin forests, degradation of soils • Risks to hydroelectricity production from climate change	• Income tax on petroleum • Income tax on energy • Petroleum products tax • Fuel taxes • Concession energy tax	• A price on the carbon emissions and pollution associated with the production of coal, oil and natural gas; potentially starting based on the carbon content of fuels before moving to a more broad-based carbon tax • Removal of price support for small-scale diesel generators
Mineral Resources	• Chemical pollution, erosion, and siltation, particularly from artisanal mines • Ongoing environmental pollution from unremediated abandoned sites	• Income tax on mineral resources • Mineral resources excise duty • Royalties and surface tax • Mineral resources fees and levies	• Develop better contract and licence terms with foreign companies • Reduce or eliminate the numerous tax rebates for megaprojects • Consider raising the surfaces tax to compensate for loss of arable land • Have companies make a cash deposit before receiving operating licences • Improve monitoring and enforcement
Transport	• GHG emissions • Air pollution	• Vehicle excise duty • Toll rates • Road taxes	• Increase taxes on the most polluting fuels • Increase taxes on larger vehicles and less efficient engines • Full phase-out of fuel subsidies • Phase-out of older vehicles • Consider congestion charges (long-term option)
Water	• Loss and degradation in wetlands and rivers • Increases in the frequency of extreme events	• Water supply regularization fee • Tax on raw water sale • Water licences and concessions	• Institute charges on certain industrial companies that don't currently pay for water • Collect fees for effluent discharge and improve monitoring and enforcement
Fisheries	• Overfishing • Habitat degradation • Pollution and natural disasters • Climate change exacerbating these challenges	• Fishing licences • Maritime activity licences • Fishing development fund charges	• Review fishing licence fees, including fees for foreign vessels relative to domestic ones • Improve monitoring and enforcement, consider raising penalties
Forestry	• Mangrove, coastal forest, and woodland deforestation • Uncontrolled fires • Clearing of virgin forests	• Charcoal and timber excise duty • Tax on timber exports • Logging fee • Timber certificate and selling fee • Logging industry fines • Reforestation tax	• Combat corruption and increase monitoring and enforcement capacity in the forestry sector, and consider raising penalties • Charge the agriculture and extractive sectors for clearing of land • Scaling up forestry licence costs

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Annex 1: Environmental and environment-related indicators for Mozambique

*Higher plants **Sum of Mammals, Birds and Fishes ***Domestic production only

Environmental Indicators	Units	Value	Year	Reference
Forest area	1,000 km²	388	2011	GOM, 2013a
Total forest area (% of total)	%	49.4	2011	GOM, 2013a
Land Protected Area (% of total)	%	17.6	2012	GOM, 2013a
Marine Protected Area (% of territorial water)	%	0.2	2012	GOM, 2013a
Threatened plant species*	number of	58	2014	GOM, 2013a
Threatened animal species**	number of	93	2014	GOM, 2013a
Total fisheries production	tons	211564	2013	GOM, 2014b
Total carbon dioxide emissions	thousand metric tons	2.882	2010	GOM, 2013a
Per capita carbon dioxide emissions	Mt of CO2	2.6	2012	GOM, 2014b
Total methane emissions	thousand metric tons of CO2e	9.772	2010	GOM, 2013a
Methane emission from energy process	%	50.5	2010	GOM, 2013a
Methane emission from agriculture	%	21.2	2010	GOM, 2013a
Total nitrous oxide emissions	thousand metric tons of CO2e	2.217	2010	GOM, 2013a
Nitrous oxide emission from energy processes	%	16.0	2010	GOM, 2013a
Nitrous oxide emission from agriculture	%	51.7	2010	GOM, 2013a
Total of other greenhouse gas emissions	thousand metric tons of CO2e	338	2010	GOM, 2013a
Mean annual rainfall	mm	80.98	2013	GOM, 2014b
Annual fresh water abstraction	billions m³	0.9	2013	GOM, 2013a
Access to improved water source (% urban population)	%	80	2013	GOM, 2013a
Access to improved water source (% rural population)	%	35	2013	GOM, 2013a
Total electricity generated***	GWh	345.7	2013	GOM, 2014b
Electricity generated from hydropower (% from total)	%	99.9	2011	GOM, 2013a
Electricity generated from coal (% from total)	%	0.1	2011	GOM, 2013a
Access to electricity (% of total population)	%	20.2	2011	GOM, 2013a

Annex 2: Green Economy - Relevant Policies and Strategies

English	Portuguese
Fifth Report on the Implementation of Biodiversity Convention (2014)	Quinto Relatório Nacional da Implementação da Convenção da Biodiversidade (2014)
Action Plan to Prevention and Control of Uncontrolled Fires, 2008-2018	Plano de Acção para a Prevenção e Controlo às Queimadas Descontroladas, 2008-2018
Agrarian Extension Master Plan 2007-2016	Plano Director de Extensão Agrária 2007-2016
Conservation Areas in Mozambique (2011)	Áreas de Conservação em Moçambique (2011)
Energy Policy (1998)	Política Energética
Energy Strategy, 2000	Estratégia de Energia, 2000
Environmental Strategy for Mozambique's Sustainable Development	Estratégia Ambiental para o Desenvolvimento Sustentável de Moçambique
Fisheries Master Plan (2010-19)	Plano Director das Pescas 2010-19
Governance and Sharing of Southeast Fishering in the Indic Ocean in Mozambique (SWIOFish)	Governação e Crescimento Partilhado das Pescas no Sudoeste do Oceano Índico em Moçambique (SWIOFish)
Green Economy Action Plan 2013-2014	Plano de Acção para a Economia Verde (Período de Transição) 2013-2014
Integrated Plan of Investiments (Priority Infrastructures to 2014-2017)	Programa Integrado de Investimentos (Infra-Estruturas Prioritárias para 2014-2017)
Master Plan for Natural Gas, 2014	Plano Director do Gás Natural, 2014
National Action Program to Climate Change Adaption (NAPA) (2007)	Programa de Acção Nacional para a Adaptação às Mudanças Climáticas (NAPA) (2007)
National Environmental Policy, 1995	Política Nacional do Meio Ambiente, 1995
National Policy of Biofuels (2009)	Política Nacional de Biocombustíveis
National Program of Agricultural Development (ProAgri II)	Programa Nacional de Desenvolvimento Agrário (ProAgri) Fase II, 2007-2010
National Report to the United Nations Conference on Sustainable Development (RIO+20)	Relatório Nacional para a Conferência das Nações Unidas sobre Desenvolvimento Sustentável (RIO+20)
National Strategy of Adaptation and Mitigation of Climate Change (2013-2025)	Estratégia Nacional de Adaptação e Mitigação de Mudanças Climáticas (2013-2025)
Policy and Strategy of Development of Forest and Bravia Fauna	Política e Estratégia de Desenvolvimento de Florestas e Fauna Bravia
Poverty Reduction Action Plan (PARP) 2011-2014	Plano de Acção para Redução da Pobreza (PARP) 2011-2014.
Readiness Preparation Proposal (R-PP) for Mozambique (2013)	Proposta de Preparação para Prontidão (R-PP) para Moçambique (2013)
Reforestation Strategy, 2009	Estratégia para o Reflorestamento, 2009
Responding to the Climate Change in Mozambique - Phase II of the INGC Project (2011)	Respondendo às Mudanças Climáticas em Moçambique - FASE II
Strategy and Action Plan for Food and Nutritional Security (2008-2015)	Estratégia e Plano de Acção de Segurança Alimentar e Nutricional (2008-2015)
Strategy and Action Plan to the Conservation of the Biological Diversity in Mozambique	Estratégia e Plano de Acção para a Conservação da Diversidade Biológica de Moçambique
Strategy and Policy of Mineral Resources, 2009	Política e Estratégia dos Recursos Minerais, 2009
Strategy of Development of New and Renewable Energy (SDNRE) for the period 2011-2025	Estratégia de Desenvolvimento de Energias Novas e Renovaveis (EDENR) para o período de 2011-2025
Towards a Green Economy (2012)	Rumo a uma Economia Verde (2012).
Vulnerability to Climate Change Evaluation and Strategy of Adaptation, 2005	Avaliação da Vulnerabilidade as Mudanças Climáticas e Estratégias de Adaptação, 2005
Action Plan for the Prevention and Control of Soil Erosion, 2008-2018	Plano de Acção para a Prevenção e Controlo da Erosão de Solos, 2008-2018

Annex 3: Green Economy Action Plan for Mozambique

Activities for 2012
1. Preparation of the roadmap for a green economy for launch at Rio+20
2. Drafting of: (i) Integrated Implementation Matrix (for a green economy) (IIM); and (ii) Green Growth Plan (GGP)
3. Strengthening of national awareness and understanding of the imperative to act for a green economy
4. Creation of a multi-sector national decision making platform for a green economy
5. Inclusive multi-sector consultations (central/provincial/district) to define the green economy and sectors
6. Inclusion of a green economy in the National Planning and Budget System (SPO)
7. Coordinating and obtaining funds, partnerships and resources to support a green economy
8. Inclusion of a green economy in the National Development Strategy (END)
9. Establishment of a system and indicators for monitoring the transition to a green economy
Activities for 2013
1. Training of sectors for adoption and implementation of IIM and GGP
2. Form new cadres in the government specializing in the green economy (MICOA, MPD, MF and MINEC)
3. Establishment of integrated knowledge/information about natural capital
3a. Mapping, quantification and characterization of natural capital
3b. Quantification and characterization of the externalities in the national economy
3c. Quantification and characterization of the benefits of in the national economy
4. Integration of the green economy in the National Planning & Budgeting System
5. Coordinating and obtaining funds, partnerships and resources to support a green economy
6. Design of a sustainable public accounts system including natural capital and a green economy
7. Monitoring of progress in the transition to a green economy
8. Strengthening of national awareness and understanding of the imperative to act for a green economy
9. Adaptation and revision of environmental governance procedures (SEA & EIA)
10. Promotion of Accelerated Development Zones and research centres for a green economy
Activities for 2014
1. Inclusion of GE in the macro planning and budget documents:
1.a Government's Five-Year Plan (PQG)
1.b Plan of Action for Reduction of Poverty (PARP)
1.c Medium-Term Fiscal Scenario (CFMP)
2. Distribution/dissemination of maps/knowledge of natural capital and ecosystem services
3. Monitoring of progress of the transition to a green economy
4. Strengthening of national awareness and understanding of the imperative to act for a green economy
5. Promoting economic areas of accelerated development and research centres with a focus on green technologies
2015-2019 Five-Year Plan - Environmental Priority Actions
Ensure the sustainable and rational use of natural resources
Strengthen coordination mechanisms on sustainable development issues
Adapt the environmental legislation, approving and disseminating new instruments
Disseminate programmes of environmental education, promoting its integration into the teaching curricula
Promote tree planting, especially in degraded and sensible to erosion areas, and in schools
Perform programmes to build the capacitation in the communities towards the natural resources management and promote the "One community, one forest" initiative
Promote mechanisms of environmental management integrated to uncontrolled burnings, soil erosion detention and recovering arid areas, through the usage of climate change adaptation technologies
Promote the creation of landfills to the adequate management of solid waste and effluents

Adopt strategies that contribute to the creation of green spaces, gardens and parks in cities and villages
Define an urban plan of territorial planning to the creation of new cities
Implement the national strategy of biodiversity conservation
Promote the investigation of good environmental practices and the utilization of clean technologies for the sustainable management of natural resources
Promote the territorial ordering and planning in a national scale with emphasis on cities, villages and coastal zones
Approve the Coastal Zone Sustainable Development Policy and promote the implementation of the action plan for the protection of sensitive ecosystems
Proceed with the efforts leading to a systematic and strategic coordination between territorial planning and district planning throughout the country
2015-2030 (Government's Five-Year Plans)
Implementation of green economy from the macro planning and budget documents and periodic assessment of the progress made in implementing a green economy in accordance with the macro documents
2030
The Mozambican economy transformed into a green economy cantered on persons and on sustainable, efficient, equitable use of natural capital, a middle-income inclusive country, based on the right of development, within planetary limits.

Source: GOM, 2012c; GOM, 2010a