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Original Article

Is Sustainable Green Growth Possible in Uganda? The Role of Fiscal Policy

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Abstract: *Recent studies have suggested that climate change could have a significant impact on economic growth and development. As a result, maintaining Sustainable Green Growth is vital to supporting economic growth and development while conserving natural resources and the environment for people's quality of life in society. Fiscal policy can play a critical role in promoting SGG beyond earlier conventional responses to climate change. Specifically, the COVID-19-induced economic downturn and uncertainty could play a catalytic role in advancing fiscal measures to support more green interventions and investments. Further, the government can continue to support and facilitate research and development (R&D) in climate-smart technologies. Other measures include stepping up the enforcement of environmental taxes and fees to correct price signals and change consumer and business behaviour towards more sustainable patterns. Fiscal incentives for green financial mechanisms can also be implemented to help leverage private financing for green investment.*

Keywords: *Green Growth, Fiscal Policy, SGG, GGDS.*

I. INTRODUCTION

Climate change affects developing countries the most. These global changes interact with local environmental challenges such as land degradation, loss of natural resources, and air and water pollution. Growing populations and urbanisation rates highlight the importance of building livelihood resilience and maintaining vital ecosystem products and services in a sustainable manner. It is anticipated that a rise in water stress would affect between 75 and 250 million people in Africa by 2020, while rain-fed agriculture production may fall by up to 50% in some Sub-Saharan African regions. This jeopardises development goals such as food security and poverty reduction, and also degrades the continent's natural wealth. As a result, the African continent is reaching environmental limits, and responding to these realities is critical for ensuring that growth is sustainable and benefits Africa's present and future generations.

Ensuring Sustainable Green Growth (SGG) is critical to fostering economic growth and development while ensuring conservation of natural resources and environment for the quality of life of people in society. Recent studies have suggested that climate change could have a significant impact on economic growth and development.

Notably, SGC is not a replacement, but rather a path to sustainable development that provides a practical and flexible approach for achieving concrete, measurable progress across its economic and environmental pillars, while fully accounting for the social consequences of greening economic growth dynamics. The World Bank Group's Environment Strategy 2012-2022 lays out an ambitious goal for developing nations to pursue "green, clean, resilient" approaches as they pursue poverty reduction and development in an increasingly fragile environment (World Bank, 2012).

In two respects, developing nations are critical to attaining global green growth. To begin, poor nations, such as Uganda, are more sensitive to climate change, and they are more reliant on natural resource extraction for economic growth than industrialised ones. They also face serious economic, social, and environmental hazards from energy, food, and water scarcity as a result of climate change and extreme weather events.

Second, while most emerging nations contribute only tiny amounts to global greenhouse gas emissions, they are projected to increase their emissions if traditional economic development trends continue. To address the aforementioned growth and development challenges without jeopardising growth and poverty reduction goals, sustainable green growth has emerged as a sound approach to reframe the conventional growth model and re-evaluate many investment decisions in meeting energy, agriculture, water needs, and economic growth resource demands.

Green growth is described in Uganda as a system or development paradigm that strives to catalyse economic growth by making effective use of the country's natural, human, and physical capital in an inclusive manner along a low carbon emission, climate resilient development pathway. It is vital to recognise that the transition to green development involves a variety of choices for some investments, necessitating a clear understanding of where governmental effort and priority should be directed.

Uganda Vision 2040 aims to achieve economic development and socioeconomic transformation based on green economy concepts such as equality, environmental sustainability, resource efficiency, climate change adaptation and mitigation, and inclusivity. The nation has created a Green Growth Development Strategy (GGDS) that will sequence initiatives for the short, medium, and long term. The strategy aims to: boost Uganda's economic growth while creating new opportunities for decent work; support a low-emissions economic growth path that incorporates resource use efficiency, climate resilience, disaster risk reduction, and optimal use of natural capital; and pursue socially inclusive growth that improves food and nutritional security. Set up an enabling institutional, governance, and funding structure to implement an appropriate green growth development plan.

Uganda is presently creating a regulatory and institutional framework to support sustainable green growth in accordance with the Vision 2040. For example, the Ugandan government created the Uganda Green Growth Development Strategy (UGGDS) to put into practise the broad green growth concepts outlined in the Sustainable Development Goals Agenda 2030 and the African Union's Agenda 2063. The strategy's overall aim is to transform Uganda through the industrialization of particular commodity value chains, which will later lead to the creation of more decent and green jobs. Despite the progress made toward greening the economy, little is known about the progress made and the subsequent plans toward greening Uganda's economy.

In terms of funding for Uganda's Green Growth Development Strategy. The Ugandan government, the private sector, and development partners are all potential sources of funding. The Global Green Growth Institute (GGGI) has agreed to work with the government to create a national green growth funding mechanism. Additionally, the strategy's investment areas will be used to assist the creation of bankable project ideas.

Furthermore, Uganda's ongoing third National Development Plan (NDP III) [NPA, 2020a] developed a national green growth financing and investment plan as a climate change intervention, built private sector capacity to access green financing and green growth response, and strengthened expenditure tracking, inspection, and accountability on green growth. This would, among other things, target current green growth finance opportunities under climate change and the different environment funds at the global and regional levels. Integration of green growth into development and sector plans, such as Uganda's ongoing third National Development Plan (NDP III), is crucial. As a climate change intervention, the National Planning Authority produced a national green growth financing and investment strategy, built private sector capacity to obtain green funding and green growth response, and strengthened spending tracking, inspection, and accountability on green growth.

One necessity and stepping stone towards greening the recovery is to integrate broader fiscal policy with decarbonization goals. Fiscal policy may shift investment and consumption decisions in favour of low-carbon options. Unfortunately, the ongoing pandemic has exposed the country's unpreparedness to support recovery efforts from the effects of the coronavirus disease 2019 (COVID19) pandemic and the associated containment measures through putting less emphasis on environmental regulations and safeguards and pushing for more economic growth. However, this might jeopardise the implementation of the UGGDS as well as the attainment of the Paris Climate Agreement, SDGs, and Agenda 2063.

Despite the fact that various studies have looked into the relationship between fiscal spending and green development, the academic community has yet to establish a link between fiscal policy and green economic growth, particularly in developing nations. This study used descriptive analysis to fill the evidence gap from Uganda. The study's findings complement the government's attempts to foster long-term green growth in Uganda.

II. METHODOLOGY

The study examines the role of Uganda's fiscal policy in ensuring sustainable green economic growth. The study largely relies on descriptive analysis of publicly available data and document review or critical policy documents and scholarly literature. These data cover fiscal variables such as total revenue (taxes and grants), expenditure, debts and green growth targets and indicators. For instance, the study collects environmental and resource productivity data, such as CO^2 productivity.

III. OVERVIEW OF GREEN GROWTH IN UGANDA

Green growth in Uganda's context is defined as an inclusive low emissions economic growth process that emphasizes effective and efficient use of the country's natural, human, and physical capital while ensuring that natural assets continue to

provide for the present and future generations (NPA, 2020b). To implement the UGGDS the government planned to spend around USD 4,972 Billion for FY 2020 to FY 2024/25 and USD 3,443 Billion for the FY2025/26 to 2029/30 period.

The focus on sustainable green growth is in response to the apparent deficiencies in models of economic growth that generated negative outcomes that were anticipated but often ignored by the politicians and general public. The shortcomings lead to a form of growth that is unsustainable and characterised by a deterioration in green growth indicators such as environmental and resource productivity (Table A), environmental dimension of quality of life (Table A2), natural asset base (Table A3), economic opportunities and policy responses (Table A4) and socio-economic context (Table A5).

More succinctly, overly focusing on growth with limited emphasis on ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies has resulted in increases in CO2 emissions from air transport per capita (from 0.03 tonnes in 2003 to 1.18 tonnes in 2021), depletion of forest resources (forest stocks reduced from 262.72 million cubic metres in 1990 to 174.62 million cubic metres in 2020), increases in annual surface temperature (from 0.42 in 1990 to 1.12 in 2021), among others. Such outcomes have negative implications not only on the economic growth but also on the quality of life of individuals. For instance, welfare costs of premature mortalities from exposure to ambient PM2.5 (per 1 million inhabitants) increased from 66.53 in 1990 to 103.67. Therefore, economic growth that is not green and sustainable is likely to roll back the achievements made over the past decades in terms of enhancing household incomes, reducing mortality due to exposure to radon, lead and ambient ozone; elevate tax and debt burdens, air and water pollution, water scarcity, and biodiversity loss, and exacerbate the climate crisis.

Proponents of sustainable green growth argue that the fundamental problem is that conventional economic growth models are environment neutral thus permitting the government and private sector to have less regard for the impact of their actions on the natural environment. Therefore, sustainable green growth models aim to counter this tendency by compelling the government, private and public sector to undertake economic growth efforts with lenses that ensure that the natural resources (assets) continue to provide the resources and environmental services that support human existence. to tax and spend within fixed constraints that do not waver with shifts in political sentiment or economic conditions.

Seven interlocking channels feed into the green growth movement. According to OECD (2011), green growth can address economic and environmental challenges while sustainably contributing to growth through enhancing productivity, innovations, creating new markets, boosting investor confidence, ensuring macroeconomic stability, reducing resource bottlenecks and reducing imbalances in the natural systems. These channels have been brought together to front a strong case for green and sustainable growth to offset the perceived shortcomings of the conventional brown economic growth.

The COVID-19 pandemic and the associated efforts to revive economies globally also justify the need to focus on greening economic growth in a post-COVID-19 world. This is because several governments put more emphasis on stimulating economic growth and gave mere lip service (in government recovery plans) to environmental regulations and green investments. Countries, in implementing their recovery plans seem to suggest that greening of growth can wait for recovery to be achieved.

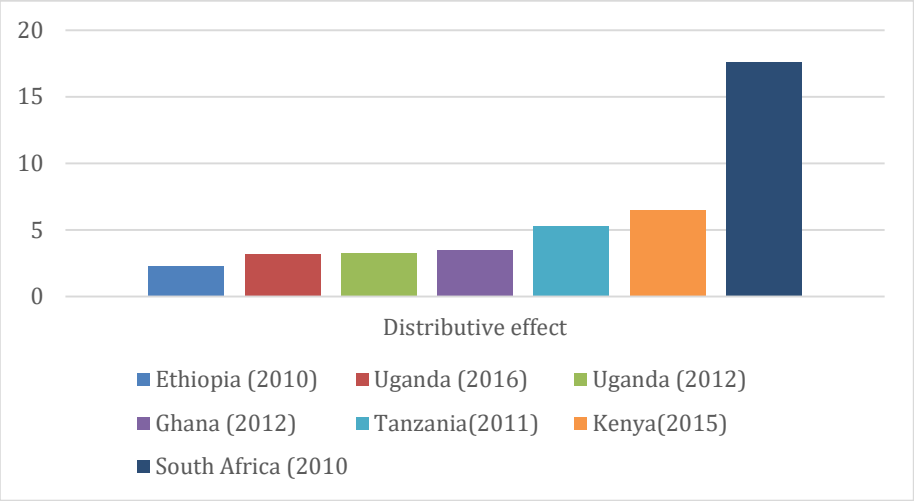
However, a return to "business-as-usual" pre-COVID normal would be detrimental to the achievement of the Sustainable Development Goals because countries were already slackening on fulfilment of their commitments such as reducing CO2 and other forms of pollution. Even so, the signing of the Paris climate agreement did not deter the increase in the global carbon emissions, with a number of countries pursuing their non-green energy policies. Consequently, undermining efforts of scaling back the impending global environmental crisis and meeting the expected green transition needed to meet the SDG and Paris Agreement climate goals.

More succinctly, without government intervention, through its fiscal policy, sustainable green economic recovery might be a far cry. It is highly likely that the emissions (CO2 and other pollutions) will increase as the economy recovers from the COVID-19 pandemic shock. Strategic fiscal policy (taxation and spending) actions are required to ensure the green transition and meet the SDG targets. For instance, these could involve carbon taxation and fiscal spending targeting priority green sectors.

IV. OVERVIEW OF FISCAL POLICY IN UGANDA

Uganda's has experienced major turnarounds in its fiscal policy ever since its independence in October 1962. Mawejje and Odhiambo (2020) indicate that the objectives of Uganda's fiscal policy evolved from stabilization (1980s) and poverty eradication (1990s) to unlocking the key growth and competitiveness constraints (2010s). These shifts have been contingent on several political, economic, social, global and behavioral factors. Therefore, it is not surprising that, fiscal policy in remains a public, scholarly and policy concern in every decade, that seems to be undergoing several major transformations.

Importantly, Uganda's fiscal policy is moderately equalizing and lowers the Gini coefficient by 3.2 points. After accounting for all taxes and transfers (including in-kind benefits such as education and health), the Gini coefficient falls from 0.434 in 2016/17 to 0.402. While this is encouraging, the size of the reduction in inequality is modest in comparison to what has lately been witnessed in other African nations such as Ghana, Tanzania, and Kenya, as well as in other countries throughout the world.



Source: Authors' own computation based on UNHS (2016/2017), CEQ institute data base and World Bank (2018). In parenthesis, is the year for which the analysis is done. The graph is arranged in ascending order of the redistributive effect (RE), that is the change un gini coefficient from market incomes plus pension of final income , except for Kenta where the effect is the change from market income to final income A positive redistributive effect,implies that income ienqulaity declines and when negative, income inequality increases

A) Pre-Poverty Eradication Action Plan (PEAP) Period

Poverty in Uganda has declined significantly during the last 20 years. Between 1992 and 2005, the proportion of the people living in poverty fell from 56.4 percent to 31.1 percent. Sluggish growth and the 2016-17 drought, however, have undone some of the gains. Inequality rose as well, with the GINI index, a measure of inequality, rising from 0.40 in 2012 to 0.43 in 2016. Using data from the Uganda National Household Survey 2016-17, a new analysis examined how the country's tax structure influenced poverty and inequality.

According to the study — Impact of Fiscal Policy on Poverty and Inequality in Uganda, Uganda's fiscal policy is moderately equalising and reduces the Gini coefficient by 3.2 points. The largest contributors to lowering inequality are personal income taxes, followed by education in-kind payments. Despite being equalising, fiscal policies in Uganda might lead to poverty.

Figure 1 provides the evolution of Uganda's fiscal policy, including revenues and grants, expenditure and net lending and the fiscal deficit. Prior to the 1990/91 – 199/1997 period, especially between 1981/82 and 1989/90, fiscal policy mainly aimed at achieving macroeconomic stability and economic recovery and it was eclipsed by the implementation of an extensive Economic Recovery Programme from 1987.

Some degree of macroeconomic stability was achieved in 1992, nonetheless, fiscal challenges of expenditure overruns, supplementary budgets, expenditure arrears, growing public deficits and increased domestic borrowing were still prevalent. Equally persistent was a shortfall in domestic revenues and grants inflows due to overly optimistic projections, and failure by donors to honor their commitments. Such shortfalls were not matched by adjustments in fiscal expenditures, thus perpetuating domestic borrowing, which resulted in increases in inflation (due to a monetary expansion). The current challenges required decisive home-grown reforms to abate a recourse to a fiscal crisis and to sustain economic recovery.

The reforms aimed at addressing these persistent challenges included merging of the Ministry of Finance and Planning and the Ministry of Economic Development in March 1992; preparing the annual budget using the three-year Budget Framework Paper (BFP) guidelines; implementation of the monthly cash flow system; short-term fiscal adjustments and improvements in fiscal planning (Reinikka & Collier, 2001).

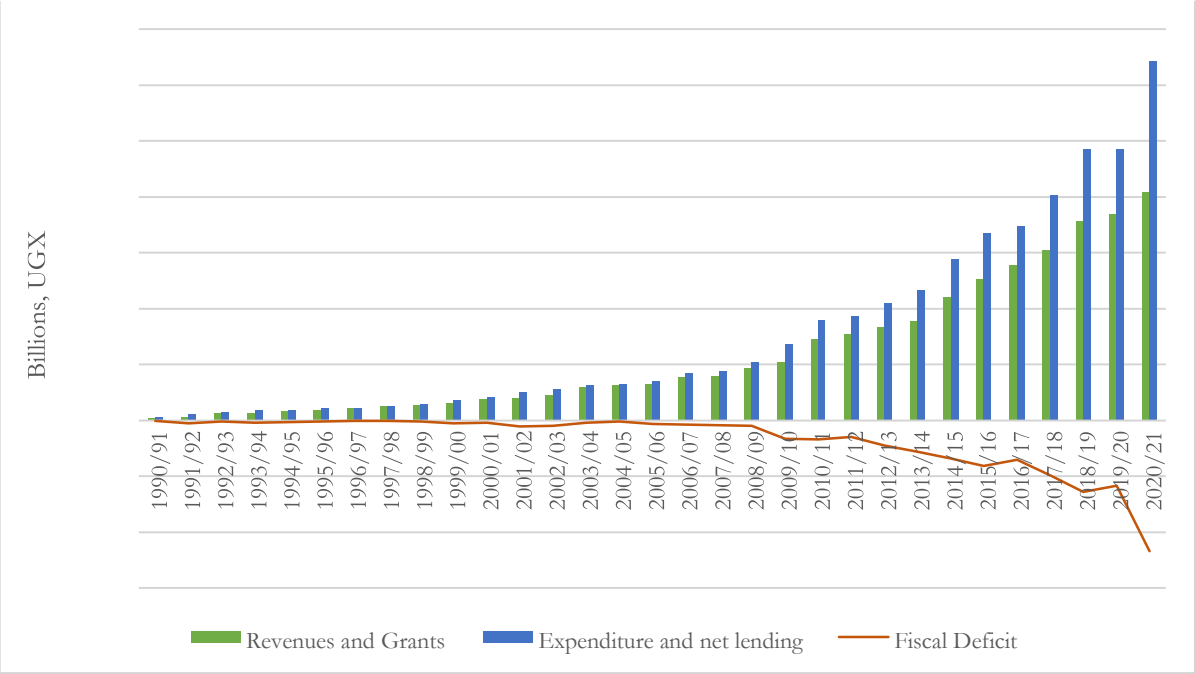


Figure 1: Trends in Uganda's fiscal policy

Source: *Author's construct using data from MoFPED (Background to the budget).*

Other reforms included formation of the Uganda Revenue Authority, introduction of the Medium Term Expenditure Framework, introduction and implementation of the commitment control system (Kuteesa, Tumusiime-Mutebile, Whitworth, & Williamson, 2010). Equally relevant was the introduction of debt management strategies including the 1991 Debt Strategy and the 1995 Enhanced Debt Strategy (ibid). These reforms resulted in fiscal discipline and stability, inflation stability, accelerated economic growth, increases in domestic revenue and improvements in budgetary allocations. In the pre-PEAP period the government focused on climate variability

B) PEAP Period

Despite the progress achieved during the period from 1990/91 to 1996/1997, the country needed to look beyond the economic recovery and address the remaining socio-economic problems and infrastructure deficits. These included high poverty levels, poor quality of education and health services and poor economic infrastructure such as roads and power stations. Therefore, the role of fiscal policy in addressing these challenges by embarking on an agenda beyond economic recovery was heightened.

The government designed and implemented the Poverty Eradication Action Plan (PEAP) between 1997/98 and 2008/09, which prioritised service delivery. In this case, as a new national planning framework, fiscal policy decisions were in line with the PEAP priorities that were expected to contribute primarily to poverty reduction. In addition, it is important to note that this era also witnessed the adoption of the Millennium Development Goals (MDGs), which were consistent with the PEAP and other sector plans to fight poverty and promote human development.

However, additional resources were required by the government to implement the PEAP interventions. As a result, the government adjusted its finances and benefited from greater donor money for poverty reduction and debt relief through the Heavily Indebted Poor Countries (HIPC) project, as well as strengthened HIPC efforts (Kuteesa, Tumusiime-Mutebile, Whitworth, & Williamson, 2010). Other reforms during this period included the introduction of the Sector Working Groups and the formation of the Poverty Action Fund (PAF).

As a result, greater resources were allocated to the PEAP's priority areas. Within three years of the beginning of the PEAP, for example, resource allocations to those fundamental services had virtually quadrupled in real terms, rising from 17% to 37% of the fast expanding government budget (ibid). It can be seen from the graph that fiscal revenues and fiscal expenditures steadily increased against the backdrop of implementing PEAP interventions. Some of the key achievements of

fiscal policy during this period include a reduction in poverty from 44 percent in 1997/98 to 31 percent in 2005/06 (NPA, 2010).

C) National Development Plan (NDP) period

Starting in 2010 to date, Uganda's fiscal policy objective is to unlock the key growth and structural constraints to accelerate social economic transformation to achieve the National Vision of a transformed society from a peasant to a modern and prosperous country within 30 years (NPA, 2010; NPA, 2015; NPA, 2020a). Importantly, addressing the structural bottlenecks led to an increase in government's focus on physical infrastructure such as roads and dams, which resulted in a reduction in spending on the social sectors such as the health and education sectors.

Unlike the PEAP that focused on the social sector and eradication of poverty, the NDP period mainly focuses on economic transformation and wealth creation but retains the poverty eradication goal (NPA, 2010). Also, the first NDP incorporated the aspirations of the MDGs, while the subsequent

NDPs have adopted the Sustainable Development Goals (SDGs). In conclusion, whereas the government focused on climate variability during the pre-PEAP and PEAP period, during the NDP period the government shifted its attention to climate change in line with the SDGs.

This shift in focus has been sparked by the high population growth, increases in income poverty, high unemployment rates, land scarcity and the influx of refugees – these challenges have direct and indirect effects on the destruction of the environment. Notably, it is also evident that the efforts to mitigate and address climate change concerns at the national level has been motivated by the other global processes such as SDGs, Conference of Parties (COPs), RIO protocol, and REDD.

Some of the notable external developments during this period include reduction in grants and budget support, increases in project support for the budget, reduction in ODA and loans from multilateral lenders, increase in loans from bilateral lenders, and increased efforts to boost domestic revenue mobilisation efforts – this is in line with the 2015 Addis Ababa Action Agenda.

The review of Uganda's Green Growth Public Expenditure (NPA, 2020b) revealed that a total Green Growth expenditure of about UGX 13, 808 bn between FY 2015/16 to FY 2017/18. Of this, 60 percent was allocated to infrastructure projects (roads construction and energy) – largely on the compensation of landowners that are displaced from their land. Therefore, other Green Growth Strategy components such as Sustainable Agriculture, Natural Resource Management and Green Cities were marginally catered for (ibid). Also, the review highlighted that the 'Green Print' of infrastructure Projects is not easily verifiable and that there was limited prioritization of Projects that are deemed to deliver more greening value in terms of the Uganda Green Growth Development Strategy outcomes (ibid).

D) COVID-19 Period

COVID-19 coincides with the NDP period. However, this period deserves particular attention because it is associated with the periods of a sharp decline in the economic growth. The government instituted containment measures that curtailed business activity but also contributed to improvement in the environment as most pollution related activities such as industrial manufacturing and travel reduced significantly. Uganda's economic growth (activity) deteriorated significantly and as a result the government responded by instituting fiscal measures to cushion the economy from the blunt of the pandemic and also support economic recovery. Fiscal stimulus packages have the potential of "greening" the recovery from the COVID-19 through the promotion of innovations and investment in climate-smart technologies and innovations. The government paid some attention to this as indicated in NDP III and the subsequent budgets. Whereas the recovery plan and the NDP III document introduced policy packages with green measures, more can be done by implementing the stipulated measures – which seems to be the thorn in the recovery plan. Also, some of the initiatives supporting green economic recovery were relatively smaller – with a focus on mainly the solar, irrigation/water supply schemes and the transport sectors (electric vehicles).

E) Summary

In conclusion, Uganda has experienced significant turnarounds in its fiscal policy since its independence. The objectives of Uganda's fiscal policy evolved from stabilisation (the 1980s) and poverty eradication (the 1990s) to unlocking the critical growth and competitiveness constraints (the 2010s). These shifts have been contingent on several political, economic, social, global and behavioural factors. More recently (in the 2020s), fiscal policy aims at cushioning the economy from the COVID19 pandemic and ensuring a sustainable recovery.

In the PEAP and pre-PEAP period the government focused on climate variability while the government focused on climate change during the NDP period. Several factors could explain the observed shift in focus on environmental

sustainability and aspect — beyond the shift in the planning periods which is associated with the change in political focus or maintaining the political relevance of the government. The most prominent factor is the change in the global agenda, that is, from millennium development goals (MDGs) to sustainable development goals. The government has continuously aligned its plans and budgets to the global agenda in order to benefit from the financial support through MDGs or SDGs funds. However, relying on international funding sometimes relives the country of the much needed political will and ownership to implement its commitments, hampers sustainability and also makes meeting the commitments and goals dependent on the international community, which can sometimes be a scapegoat for underperformance.

There are efforts by the government to ensure sustainable green growth. Over the past decades, Uganda largely followed a conventional approach to economic growth (brown investments) that had limited consideration for the environmental impacts of the investments. This increased the amount of CO2 emissions and pollution. However, the government has established a national strategy (Uganda Green Growth Development Strategy) to ensure green investments to foster a green transition, though challenges such as COVID-19 are thwarting earlier efforts to green the economy. For instance, the Uganda Green Growth Development Strategy maps out the sustainability plan and implementation roadmaps for achieving the SDG climate change related targets by 2030.

V. ROLE OF FISCAL POLICY IN PROMOTING SUSTAINABLE GREEN GROWTH

Fiscal policy can play a critical role in promoting sustainable green growth beyond earlier conventional responses to climate change. Specifically, the COVID-19-induced economic downturn and uncertainty could play a catalytic role in advancing fiscal measures to support more-green interventions and investments. These measures could be incorporated in the various policy and budget documents including the budget framework papers, the annual budgets and the budget strategy.

The government can adopt fiscal policy instruments – either through spending and/or taxation – to ensure sustainable green growth in the post-COVID-19 era as discussed below:

A) Tax Measures

The government can support green economic growth efforts by addressing climate change through designing and implementing mitigation and adaptation measures. More notably, there's an urgent need to explore and implement comprehensive implicit and explicit carbon taxes to keep the rising carbon rates low. However, the revenues obtained from these carbon taxes should be channeled to other related mitigation and adaptation measures such as investment in renewable energy – in other words, carbon taxes should support the green transition. Also, the government must guard against devising taxes that might stifle the ability of households, especially poor households, to access and use energy.

Conversely, the adoption of more sustainable and green innovations can be fast-tracked by lowering the taxes charged. This would incentivize producers (and/or importers) to increase the supply of innovations and also make it easier for people to adopt these items such as energy efficient appliances and solar panels among others. Whereas this might have implications on the domestic revenue mobilized from taxes, it would be ideal take a thorough look at the possible scenarios through evidence-based research to inform the decisions. Relatedly, the government must play a regulatory role to ensure that companies that benefit from lower taxes do not use this incentive to make money by charging high prices for their products, thus perpetuating exploitation of government and the citizens.

B) Government Expenditure Measures

The government can invest in climate-smart infrastructure such as renewable power generation. Whereas the government has made and is expected to make more investments in hydroelectric power, sizable investments in solar and wind energy need to be explored especially in areas where their potential for take-off and scale-up is high. Relatedly, the government can support efforts to scale up investments where they already exist but with a proven success record. Further investments in infrastructure resilience might be crucial for bolstering economic growth and addressing climate risks from floods and other shocks.

Furthermore, additional government funding is required to achieve the outcomes of the Uganda Green Growth Development Strategy such as investing in more efficient energy sources such in the use of biomass for cooking and industrial use, forest and wetland restoration, access to water for irrigation, use of solar energy, and mass (public) transport.

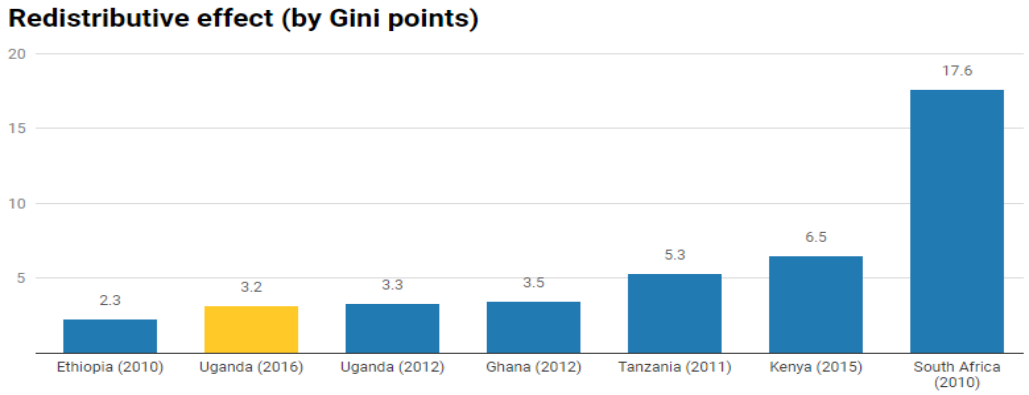
The government can continue to support and facilitate research and development (R&D) in climate-smart technologies. The government has already demonstrated its commitment to support climate-smart technologies in the transport sector such as the manufacture (production) of electric cars. However, more support should also target the industry and energy sectors, which are large emitters of carbon dioxide. Public private partnerships can also be leveraged where the private sector has more technical expertise to lead the innovation process, with government providing loans and/or grants for green innovations.

Supporting sustainable green economic growth requires that the government undertakes efforts to ensure debt sustainability. Efforts to ensure that the debt remains sustainable would enable the government to fast track the green transition with minimal or limited fear that it has to under invest in the green economy. Domestic efforts for promoting and ensuring debt sustainability by reducing expenditures through curbing corruption, fiscal slippages and the creation of more administrative units should be stepped up.

Overall, the aforementioned fiscal measures are expected to boost employment and economic growth both in the short and long term. More importantly, support to innovations and R&D should be complemented by public and private investment in supportive infrastructure networks such as cover electric vehicle charging stations and skilling od technicians for solar and wind energy sectors. Also, the government needs to honour its commitment to ensure that it meets its SDG targets.

Uganda's fiscal policy is fairly equalizing and lowers the Gini coefficient by 3.2 points. The Gini coefficient for 2016/17 fell from 0.434 before any fiscal intervention to 0.402 after accounting for all taxes and transfers (including in-kind payments such as education and health). Despite this, it is crucial to emphasise that the amount of the reduction in inequality is mild in comparison to what has recently been witnessed in other Sub-Saharan African nations such as Ghana, Tanzania, and Kenya, and notably South Africa (see fig 2).

Re-distributive effect of fiscal policy of selected countries (by gini coefficient)



The year for which the analysis was conducted is indicated in parenthesis. The graph is ranked from the smallest to the largest redistributive effect, which is the change in the Gini coefficient from market income plus pensions to final income, except for Kenya, where the effect is the change from market income to final income. When the redistributive effect is positive, inequality declines; when it is negative, it increases.

Source: Authors' calculation based on UNHS 2016/17; CEQ Institute database; and World Bank (2018a).

While equalizing, fiscal policy is poverty-inducing in Uganda. Direct payments, while pro-poor in distribution, are now insufficient in terms of coverage or volume to offset the buying power losses caused by indirect taxes, primarily VAT and excise taxes. As a result of fiscal policy, the poverty rate rises by 2.3 percentage points when all taxes, indirect subsidies, and direct transfers are included, as illustrated in Figure 2.

Inclusive economic growth in Uganda depends upon access to high-quality services such as education, health, water and sanitation, better human capital development, and targeted social protection to reduce the vulnerability of the population to adverse shocks. This requires increasing efficiency and, unavoidably, the level of government spending. Some potential revenue sources include extending the personal income tax (PIT) base and eliminating VAT exclusions. The latter would render the VAT a regressive fiscal tool in relative terms, with the impact on the poor having to be mitigated by increased social protection measures.

VI. CHALLENGES OF USING FISCAL POLICY FOR SUSTAINABLE GREEN ECONOMIC GROWTH IN A POSTCOVID-19 RECOVERY ERA

The anchoring of environmental policy goals in fiscal policy has become even more important given the major role of fiscal measures in the current post-COVID-19 era. The economic reconstruction also represents a window of opportunity for green fiscal policy, insofar as energy and raw material prices are low and public budgets will be coming under pressure to consolidate after the end of the economic stimulus measures.

In view of the social upheavals of the crisis, the social design of the green fiscal measures is even more important for their acceptance than it already is. The COVID-19 crisis has made it crucial for developing countries to reform their tax systems to generate more resources at the national level. In an attempt for Uganda government to implement fiscal policy, several challenges ranging from fiscal or economic, political, social, legal, institutional or policy related to ethical challenges.

Serious challenges remain for Uganda around governance and transparency. In 2016, Uganda's public sector was ranked 151st out of 176 countries for corruption, costing the country around US$286 million every year. Corruption at this scale exerts a significant drag on development. Consistent economic growth since the mid-1990s helped to cut the overall rate of extreme poverty from 56% in 1992 to 20% in 2014, but since then poverty has begun to tick up again. Such could undermine the effectiveness of the fiscal policy

Uganda's green economy policies are relatively strong, at least on paper. Uganda's challenge is to meet its ambitious targets with strong implementation. Citizens and civil society groups have a crucial role in ensuring the government strengthens its institutions, tackles corruption and delivers on its commitments - making sure that well-intentioned green policies achieve their fullest social and environmental impact.

Global warming, climate risks, and climate disasters are occurring with higher frequency and can move economies onto a lower-growth path with greater financial instability, fiscal constraints, and even poverty traps. This is especially true for more vulnerable developing countries.

Sometimes political unrest and instability makes the ability to adopt and implement any such policy options more challenging. Much of the contention arises with the how the government should finance climate change policies. The political feasibility of some of the measures especially carbon taxation will greatly depend on the views of the manufacturers, who can easily use lobbies and other political activities to influence the parliamentarians. Also, the uncertainty imposed by the COVID-19 pandemic has undermined the resilience of countries, which could affect their willingness to work together for common socio-economic objectives.

Poor information. Fiscal policy will suffer if the government has poor information, especially on critical indicators, programmes and interventions. For instance, if the government believes there is going to be a recession, they will increase aggregate demand, however, if this forecast was wrong and the economy grew too fast, the government action would cause inflation.

In conclusion, using fiscal policy for sustainable green economic growth is associated with a number of side effects such as disincentives of tax cuts, side effects on public spending, poor information, time lags, and budget among others.

VII. CONCLUSIONS AND KEY POLICY RECOMMENDATIONS

Sustainable green growth is possible in Uganda. Uganda is creating a platform on which the broader economy could build new innovations, business models, and modes of value creation that consider environmental protection (conservation) and economic growth as complementary goals and not trade-offs. Whereas the plans are long term, some of the interventions that are critical for delivering SGG are short term. Therefore, more emphasis needs to be put on how to structure the transformation from low-emissions energy, transport and procurement systems to alter and expand the possibilities for value creation and growth.

Ensuring sustainable green growth in Uganda requires new alternative models for economic development that take into aspects of environmental sustainability, rising wellbeing, declining inequality and system resilience. This can be achieved through implementing a fiscal policy that promotes sustainable green growth in a post-COVID-19 era. Specifically, the COVID-19induced economic downturn and uncertainty could play a catalytic role in advancing fiscal measures to support more-green interventions and investments. These measures could be incorporated into the various policy and budget documents including the budget framework papers, the annual budgets and the budget strategy.

Strengthening the implementation of environmental taxes and charges to correct price signals and shift consumer and business behaviour towards more sustainable patterns. For instance, in the energy sector, this can be through carbon taxation, which provides across-the-board incentives to reduce energy consumption and shift to cleaner sources of energy. Revenues from carbon taxes can be used to fund priorities highlighted in the global SGD agenda.

Fiscal incentives for green financial mechanisms can leverage private financing for green investment. For instance, fiscal policy can play an important role in promoting research and innovation in new energy-efficient technologies and incentivizing green investment. Fiscal incentives such as direct subsidies and tax incentives can lower the private cost of research and development so that firms are inclined to invest more.

Budgetary reforms to align government expenditure with environmental goals and enhance the effectiveness of public spending will also be required in a post-COVID-19 era.

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Annex: 1: Overview of green growth in Uganda

Table A1: Environmental and resource productivity

		Unit	1990	1995	2000	2010	2015	2016	2017	2018	2019	2020	2021
CO2 Productivity	CO2 emissions from air transport per capita	Tonnes	..	..	..	..	0.03	0.04	0.05	0.06	0.29	1.17	1.18
	CO2 emissions from air transport per unit of GDP	Kilograms, 2015	..	..	..	..	0.02	0.02	0.02	0.03	0.13	0.52	..
Non-energy material productivity	Non-energy material productivity, GDP per unit of DMC	US dollars per kilogram, 2015	0.27	0.33	0.38	0.57	0.63	0.65	0.66	0.68	0.70	..	..
	Biomass, % of DMC	Percentage	99.73	96.70	94.70	87.17	81.08	80.07	79.87	78.85	78.27	..	..
	Non-metallic minerals, % of DMC	Percentage	0.16	3.19	4.96	12.36	18.59	19.66	19.83	20.84	21.44	..	..
	Metals, % of DMC	Percentage	0.11	0.12	0.34	0.46	0.33	0.28	0.30	0.31	0.29	..	..

Table A2: Environmental dimension of quality of life

		Unit	1990	1995	2000	2010	2015	2016	2017	2018	2019	2020	2021
Exposure to environmental risks	Mean population exposure to PM2.5	Micrograms per cubic metre	34.96	36.67	39.98	38.86	43.21	41.77	38.55	37.21	35.23	..	..
	Percentage of population exposed to more than 10 micrograms/ m3	Percentage	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	..	..
	Percentage of population exposed to more than 35 micrograms/ m3	Percentage	49.74	59.65	88.29	78.47	96.11	87.82	73.91	57.76	49.60	..	..
	Mortality from exposure to ambient PM2.5	Per 1 000 000 inhabitants	66.53	69.22	87.61	102.76	124.07	121.89	112.16	108.08	103.67	..	..
	Welfare costs of premature mortalities from exposure to ambient PM2.5, GDP equivalent	Percentage	0.67	0.70	0.88	1.03	1.25	1.23	1.13	1.09	1.04	..	..
	Mortality from exposure to	Per 1 000 000 inhabitants	5.28	3.83	1.88	1.91	4.54	3.39	3.08	4.61	5.01	..	..

	ambient ozone												
	Welfare costs of premature deaths from exposure to ambient ozone, GDP equivalent	Percentage	0.05	0.04	0.02	0.02	0.05	0.03	0.03	0.05	0.05	..	..
	Mortality from exposure to lead	Per 1 000 000 inhabitants	44.52	48.25	47.92	35.48	32.47	31.79	30.84	30.43	29.84	..	..
	Welfare costs of premature deaths from exposure to lead, GDP equivalent	Percentage	0.45	0.49	0.48	0.36	0.33	0.32	0.31	0.31	0.30	..	..
	Mortality from exposure to residential radon	Per 1 000 000 inhabitants	0.92	0.92	0.92	0.88	0.92	0.92	0.92	0.93	0.94	..	..

Table A3: Natural Asset Base

		Unit	1990	1995	2000	2010	2015	2016	2017	2018	2019	2020	2021
Forest resources	Forest resource stocks	Cubic metres, Millions	262.72	..	233.35	203.99	189.30	..	..	..	..	174.62	..
	Naturally regenerating forests, % total forest area		95.25	..	91.52	86.67	83.65	..	..	..	..	80.10	..
Atmosphere and climate	Annual surface temperature, change since 1951-1980	Number	0.42	0.51	0.35	1.30	0.83	0.93	1.40	0.70	1.23	0.85	1.12

Table A4: Economic Opportunities and Policy Responses

			Unit	1990	1995	2000	2010	2015	2016	2017	2018	2019	2020	2021
Economic opportunities and policy responses	Technology and innovation: Patents	Development of environmentrelated technologies, % all technologies	Percentage	0.00	0.00	0.00	0.00	0.00	0.00	13.51	13.62	..	..	..
		Relative advantage in environment-related technology	Ratio	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.47	..	..	..
		Development of environmentrelated technologies, % inventions worldwide	Percentage	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	..	..	..

		Development of environmentrelated technologies, inventions per capita	Number	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	..	..	..
	Environmental taxes and transfers	Environmentally related taxes, % GDP	Percentage	..	2.42	2.30	1.64	1.61	1.65	1.76	1.82	1.84	..	..
		Environmentally related taxes, % total tax revenue	Percentage	..	24.93	21.52	20.89	15.09	15.07	15.35	15.56	15.04	..	..
		Energy related tax revenue, % total environmental tax revenue	Percentage	..	91.99	91.68	89.03	88.95	90.01	91.06	90.59	91.09	..	..
		Road transport-related tax revenue, % total environmental tax revenue	Percentage	..	8.00	8.32	7.22	6.24	4.41	4.21	4.49	3.98	..	..
		Diesel end-user price, USD per litre	US dollars per litre, 2015	..	..	..	3.02	2.57	2.22	2.41	2.79	2.85	..	..
		Petrol end-user price, USD per litre	US dollars per litre, 2015	..	..	..	3.77	3.19	2.84	2.83	3.13	3.09	..	..

Table A5: Socio-economic context

			Unit	1990	1995	2000	2010	2015	2016	2017	2018	2019	2020	2021
Socioeconomic context	Economic context	Real GDP, Index 2000=100	Index, 2000=100	53.17	74.61	100.00	203.72	265.02	277.69	286.38	304.44	324.04	333.60	..
		Real GDP		16,326.21	22,909.40	30,704.59	62,551.64	81,372.23	85,262.64	87,932.55	93,475.76	99,494.42	102,430.80	..
		Value added in agriculture, % of total value added	Percentage	56.58	49.39	29.38	27.28	23.27	25.89	24.82	24.66	25.58	25.56	..
		Value added in industry,	Percentage	11.06	14.29	22.90	26.62	29.40	26.97	28.04	28.74	28.19	29.30	..

		% of total value added											
		Value added in services, % of total value added	Percentage	32.36	36.32	47.72	46.10	47.32	47.13	47.14	46.60	46.23	45.14	..
		Labour tax revenue, % GDP	Percentage	..	0.98	1.46	1.77	2.60	2.75	2.83	2.89	3.05	3.12	..
		Labour tax revenue, % total tax revenue	Percentage	..	10.10	13.69	22.54	24.41	25.06	24.70	24.73	25.01	27.43	..
		Real GDP per capita	US Dollar, 2015	940.75	1,122.29	1,298.28	1,928.93	2,128.75	2,150.43	2,136.02	2,187.64	2,247.47	2,239.37	..
		Nominal exchange rate		428.85	968.92	1,644.48	2,177.56	3,240.65	3,420.10	3,611.22	3,727.07	3,704.05	3,718.25	3,587.05
		Purchasing power parity		190.18	468.45	560.94	799.01	1,125.47	1,211.94	1,270.61	1,295.95	1,311.42	1,331.07	1,338.64
		GDP deflator		7.49	20.82	27.10	76.87	100.00	104.78	109.65	114.52	117.96	121.17	126.25
	Social context	Population	Per 1 000 inhabitants	17,354.39	20,413.16	23,650.16	32,428.16	38,225.45	39,649.17	41,166.59	42,729.03	44,269.59	45,741.00	..
		Population, ages 014, % total	Percentage	48.01	48.97	49.66	49.09	47.99	47.53	47.11	46.72	46.36	46.02	..
		Population, ages 15-64, % total	Percentage	49.41	48.57	48.05	49.04	50.13	50.56	50.96	51.33	51.68	52.00	..
		Population, ages 65 and above, % total	Percentage	2.58	2.46	2.29	1.87	1.88	1.91	1.93	1.95	1.97	1.99	..
		Women, % total population	Percentage	50.34	50.60	50.77	50.92	50.88	50.85	50.81	50.78	50.74	50.71	..
		Total fertility rate, children per woman	Children	7.08	6.99	6.83	6.02	5.32	5.16	5.01	4.90	4.78	4.67	..
		Life expectancy at birth	Years	45.72	44.40	47.14	57.44	61.44	62.10	62.76	63.08	63.40	63.73	..
		Net	Per 1 000	146.0	-	-	-	386.0	614.7	843.4	558.7	274.0	-	..

		migration	inhabitants	0	64.00	222.00	380.00	8	8	7	5	4	10.67	
		Population density, inhabitants per km2	Inhabitants	71.85	84.51	97.91	134.25	158.25	164.14	170.43	176.90	183.27	189.36	195.09