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LIBERIA

SELECTED ISSUES

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LIBERIA

SELECTED ISSUES

September 16, 2025

Approved By
The African Department

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LIBERIA - PUBLIC INFRASTRUCTURE SCALING-UP: CHALLENGES AND OPPORTUNITIES[1]

Following the end of the civil war and debt relief in 2010, public investment in Liberia has remained insufficient to narrow the large gap. Given the country's very low per-capita capital stock, higher levels of public investment spending are essential. In the current context of declining external support, mobilizing additional revenue has become even more critical to create the fiscal space needed for infrastructure development. This will help support stronger growth while maintaining debt sustainability. A multipronged approach—focused on increasing revenues and public capital spending and supported by improved public investment management and more efficient tax collection efficiency—will accelerate growth and mitigate the potential negative impact of investment scaling-up on debt sustainability.

A. Motivation

1. The Liberian authorities have set ambitious goals of scaling up investment in public infrastructure and human capital under the new reform agenda, the ARREST Agenda for Inclusive Development (AAID).[2] Achieving these goals will require concerted efforts to create fiscal space for increasing public investment without undermining debt sustainability.

2. Large infrastructure gaps and extensive development needs have significantly hindered potential growth. The 2024 ECF program aims to restore fiscal sustainability and create sufficient fiscal room for critical infrastructure projects, while safeguarding debt sustainability. This approach, together with the authorities' multi-year agenda, is expected to help tackle high under-employment and improve living standards.

3. The objectives of the paper are to: (i) provide an overview of the public investment in Liberia; and (ii) assess the macroeconomic implications of two scaling-up scenarios over the five-year period of the AAID, under various financing options, including domestic revenue mobilization, concessional borrowing, and non-concessional borrowing. The paper also underscores the importance of structural reforms to accelerate revenue mobilization and improve the efficiency of public investment management.

4. To assess the impact of higher capital spending under various financing assumptions on growth and debt sustainability, this paper employs the DIGNAR model developed by the IMF. The Debt, Investment, Growth and Natural Resources (DIGNAR) model, calibrated for the Liberia economy (see Appendix I), is a dynamic general equilibrium macroeconomic framework encompassing key policy variables. On the revenue side, it captures

[1]Prepared by Giuseppe Cipollone (AFR) and Azar Sultanov (RES), with extensive contributions from Thabang Ernest Molise and Miguel Otero Nule (AFR).

[2] www.mfdp.gov.lr

changes in income and consumption taxes, while on the expenditure side, it accounts for variations in current spending and capital investment. Additionally, the model facilitates an assessment of the effects of fiscal structural reforms in revenue administration and public investment management.[3]

B. Financing Sources for Public Investment After the Civil War

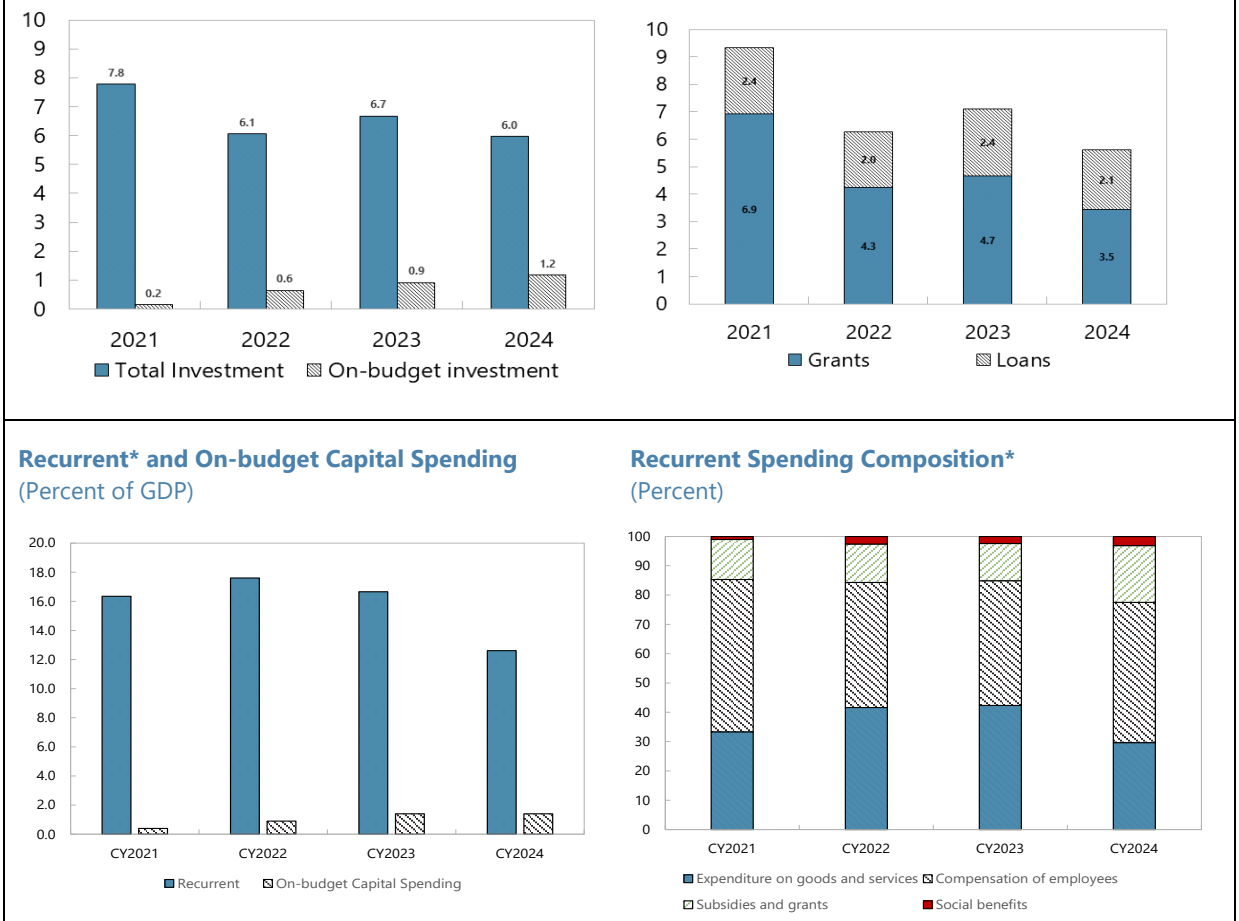
5. Since the end of the civil wars, Liberia has made substantial public investment, including through off-budget spending, both in nominal terms and as a share of GDP. The completion of the debt relief in 2010 created significant fiscal space for investment, leading to a sharp increase in externally financed projects. More recently, total public investment (on- and off-budget) has averaged 6.5 percent of GDP (2021-24), broadly in line with the ECOWAS average (6 percent of GDP) and Sub-Saharan Africa (6.9 percent of GDP). However, on-budget capital spending has been much lower—less than 1 percent of GDP over the same period (Text Figure 1)—although it rose considerably in 2024 in line with program targets under the current ECF program. The low domestically financed on-budget investment spending reflects: (i) the initial low budget appropriation, and (ii) the re-allocation of budget resources to recurrent spending, including those under the direct control of the Legislature through either ad-hoc reallocations or supplementary budget (over the period 2022-23, the executed budget was 25 percent higher than the adopted budget allocation). Over the past decade, externally financed capital projects have accounted for more than 90 percent of the total capital spending budget, with domestic financing playing only a marginal role. External grants have been the main source of financing but have been declining in recent years, partly due to IDA-20's shift from grants to loans with highly concessional terms.[4] As a result, IFI loans have increasingly replaced grants and are expected to play an even greater role going forward. Consequently, concessional debt from IFIs [1]now constitutes the bulk of Liberia's external debt.

6. The lack of integration between government-funded investment projects (so-called Public Sector Investment Plan, or PSIP) and donor-funded capital spending undermines the budget comprehensiveness. The PSIP project list includes several projects that are not adequately classified *ex-ante* as either capital or recurrent components (e.g. compensation, G&S and subsidies/grants). Proper classification across budget codes typically occurs only during the execution phase. Historically, many PSIP projects have been treated as residual items in budget execution, frequently subject to postponement or cancelation toward the end of the fiscal year due to financing shortfalls, thereby undermining the effectiveness of budget policy.

[3] Buffie et al (2012) and Melina, Yang and Zanna (2016) explain the main transmission mechanisms in both the Debt Investment Growth (DIG) model and its extension DIGNAR.

[4] The recent US Administration decision to substantially reduce USAID assistance is another declining factor for external support (grants).

Text Figure 1. Capital vs Recurrent Spending and Financing



Source: Authorities' data; and IMF staff calculations. (*) Recurrent expending excluding interest expenditures.

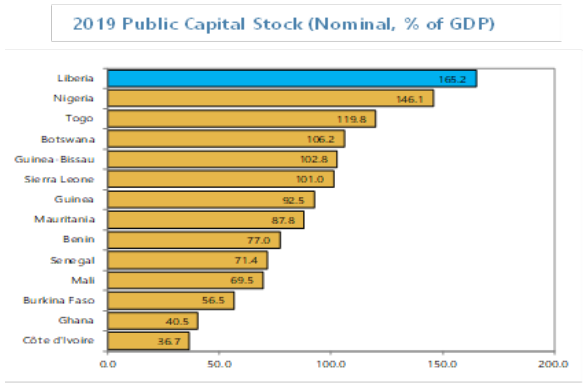
7. The implementation of government-funded investment projects has continued to underperform, characterized by frequent circumvention of procurement requirements and persistent weaknesses in public investment management. The reform measures under the current Fund-supported program are designed to address these deficiencies (see below).

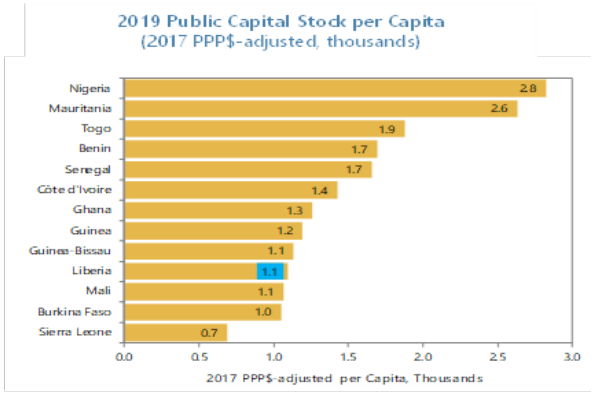
C. Liberia's Infrastructure Gap

8. Liberia's low capital stock and the poor quality of its public infrastructure are largely a legacy of its troubled history. Prior to the civil wars, Liberia's public infrastructure was more advanced—both in scale and quality—than that of its peers. However, two decades of conflict and social unrest severely depleted much of the public capital stock, leaving the remaining infrastructure in poor condition. Although Liberia's capital estimated at approximately 165 percent

of GDP is above the SSA average, its per capita stock remains significantly lower than that of SSA and neighbor countries. This reflects both low investment levels in recent years, insufficient to reduce the large gap, and the persistent deterioration in infrastructure quality.

Text Figure 2. Nominal and Per-Capita Capital Stock





Source: IMF Fiscal Affairs Department - Expenditure Assessment Tool

9. As a result, the Liberia's public infrastructure situation is characterized by significant gaps and deficiencies:

a) **Power generation and electricity assess:** Power generation capacity is grossly inadequate and unable to meet the current demand, resulting in an unreliable power supply. Access to electricity is limited to only about a third of the population. No significant progress has been made in upgrading existing facilities or constructing new power plants. The lack of reliable electricity supply is one of the key obstacles to domestic and foreign investments.

b) **Electricity grid:** The electricity grid is extremely limited, covering only parts of the capital, and is outdated relative to that of its peers. Despite some investment in hydropower, many households and business rely on fuel-powered generators, especially during the dry season.

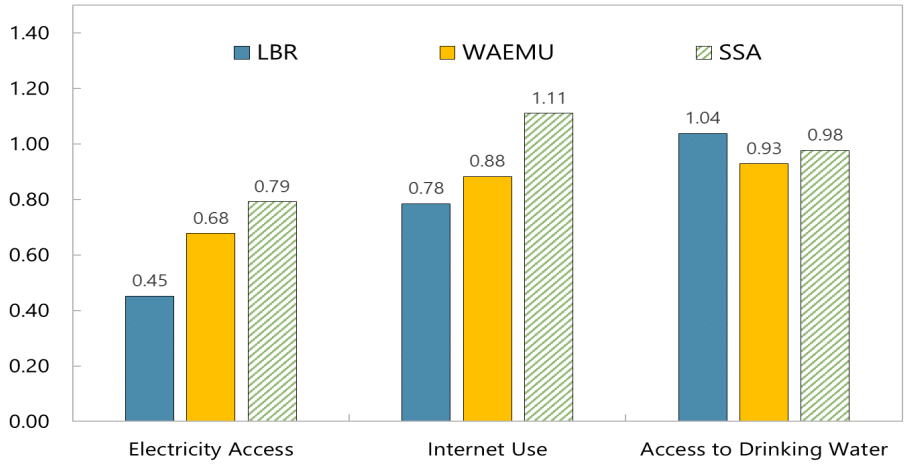
c) **Drinking water:** Access to drinking water is marginally better than in peer countries, but remains limited to less than a quarter of the population, and water quality is generally poor.

d) **Internet connectivity:** Internet access remains severely constrained, limited mainly to parts of Monrovia, with very low download speeds.

e) **Road network:** Most roads are unpaved, resulting in high transportation costs. Paved roads total only 1,131 km, representing 8.7 percent of the estimated 13,000 km network required. During the rainy season, poor maintenance and unpaved roads isolate rural communities, restricting access to health, education, and social services and impeding trade and rural development.

Text Figure 3. Selected Quantitative Indicators of Infrastructure 2022

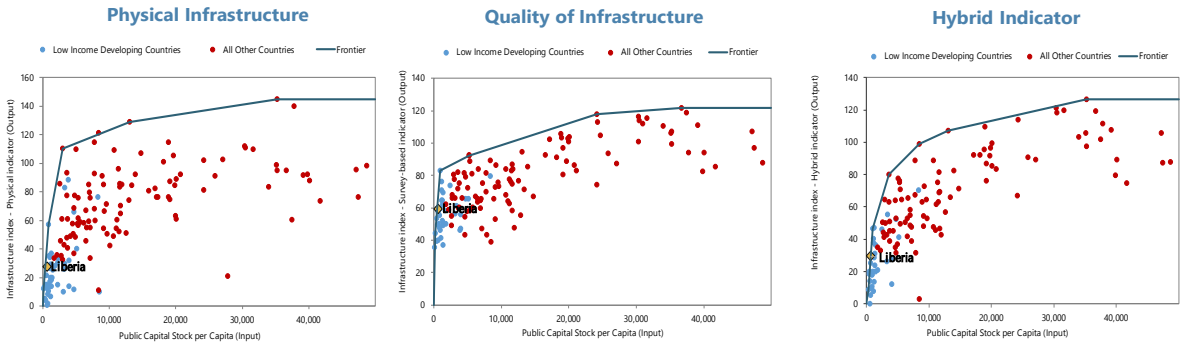
(Normalized to CIV values)



Source: World Development Indicators-World Bank; and IMF staff calculations.
Note: (*) CIV=Côte d'Ivoire. Using simple average across Sub-Sabaharan Africa (SSA) and West African Monetary Union (WAEMU) countries where available.

10. The public infrastructure gap is aggravated by the poor quality of existing infrastructure (Text Table 4). Survey-based indicators suggest that infrastructure quality is low, implying that the actual condition of infrastructure is worse than what quantitative measures indicate. This underscores the need to improve the efficiency of public investment, as Liberia could achieve greater infrastructure outputs by strengthening institutions that plan, execute, and monitor public investment.

Text Figure 4. Illustrative Efficiency Frontier



Sources: Making Public Investment More Efficient. International Monetary Fund, 2015, and updates.

D. Public Investment Management

11. Public investment can be an important catalyst for economic growth, but its benefits depend crucially on efficiency. The IMF's latest Public Investment Management Assessments (PIMA)[5] for Liberia highlights significant institutional weaknesses in public investment management (PIM). These weaknesses are more pronounced in (i) project appraisal, selection, and management; (ii) national planning and central-local coordination; (iii) multi-year budget and its comprehensiveness; and (iv) ex-post independent auditing and assessment of large-scale projects (Text Figure 5). At the same time, the PIMA notes some progress, including the publication of the fourth post-debt relief 5-year National Development Strategy, which is expected to serve as the cornerstone for prioritizing projects and mobilizing donors and IFIs financing. Finalizing the public investment policy and related manual, which will set out the public investment management cycle, including the criteria for prioritization and approval, for either government-funded or donor-financed projects, will play a critical role.

12. The PIM framework has seen some improvement, though further reforms are needed for effective capital budget execution. The 2025 PIMA finds marginal improvement compared to the initial assessment in 2016 (Text Figure 5). The adoption of new PFM regulations in 2024, in support of the ECF-supported program, has strengthened the legal framework. This represents an important first step towards establishing a coherent, integrated legal basis to improve public investment implementation and efficiency.

13. Despite this progress, broader institutional reforms remain limited. Overlapping mandates and institutional proliferation have eroded management capacity and weakened ownership of investment management responsibilities. Critical weaknesses persist in several key areas, including project planning, appraisal, selection, public procurement, and capital budgeting.

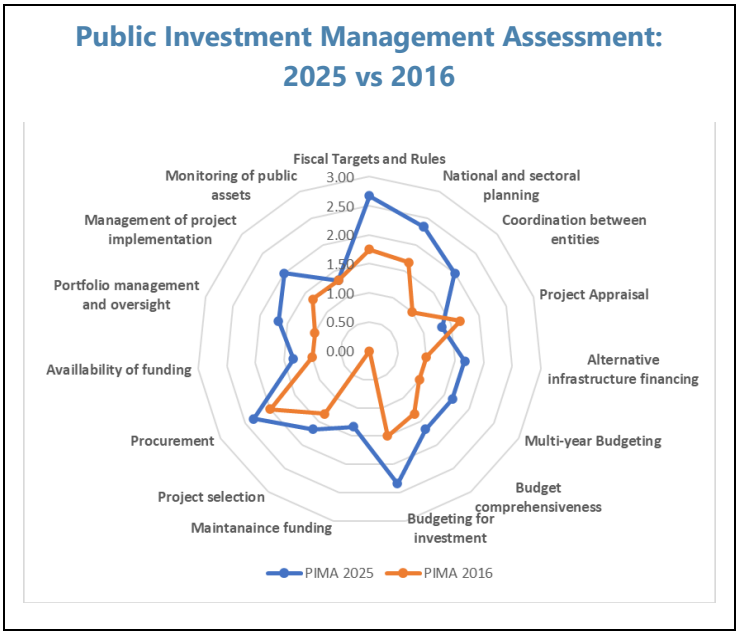
14. The 2025 PIMA identified several priorities for reform:

- **Project planning:** Formal project planning is largely absent. While the AAID (2025-29) outlines key pillars for national development strategy, supporting policies, and programs with cost estimates and expected outcomes for each of six pillars, it lacks a detailed, prioritized project list. Developing and regularly updating a consolidated list of government-funded projects would strengthen planning. Externally financed projects, typically selected and executed by donors, could remain outside this scope.

- **Project appraisal:** Appraisal is fragmented and limited. Most donor- and IFI-financed projects are appraised by the financing institutions themselves, with minimal involvement of Public Investment Units (PIUs) of relevant MACs. However, for government-funded projects (PSIP), MACs rely on their PIUs, whose appraisal methodologies focus on technical and legal compliance (e.g., land permits and environmental analysis) but lack robust economic and

[5] International Monetary Fund: Public Investment Management Assessment, March 2025.

financial analysis. The MFDP's central PIU also lacks the capacity to review the appraisal submitted by MACs.



- **Project selection:** Selection of government-funded projects lacks transparency and objective

- **Criteria:** Decisions are made at senior levels without standardized procedures across MACs to ensure alignment with national priorities, adequate financial and socio-economic returns, or inclusion of maintenance costs to be secured in future budgets.

- **Public procurement:** Procurement remains weak. Many MACs have failed to submit annual procurement plans or provide adequate reporting on awarded contracts, limiting competition among suppliers and contractors. The recent rollout of e-procurement has potential to promote competition and strengthen oversight. Encouragingly, procurement plan submissions by MACs have increased in recent months.

- **Capital budget documentation:** Budget documentation is incomplete. While the PSIP list is included in the national budget, detailed breakdowns of cost components (e.g., capital, compensation, and recurrent spending) are absent. Projects are often canceled or postponed during budget execution when financing falls short (e.g., due to commitment reversal). Externally financed projects are listed, but project-by-project documentation is not available, and no information is provided on PPPs or concession-based investment.

E. Investment Scaling-Up Strategy for Liberia

15. The authorities have undertaken a significant fiscal adjustment under the EFC-supported program. The baseline captures this fiscal consolidation, aimed at restoring fiscal discipline by rationalizing unproductive spending and raising revenues to create space for higher government-funded capital spending. This approach is expected to catalyze additional donor financing for critical infrastructure, which is essential to overcome the limited domestic financing options and to mitigate the risks of crowding out private investment.

16. This section assesses the macroeconomic and debt sustainability implications of alternative public investment scaling-up scenarios (Figure 1). The analysis employs the IMF's

DIGNAR[6] calibrated to Liberia's structural characteristics. This dynamic general equilibrium model evaluates the effects of several investment strategies on GDP, private investment, consumption, and fiscal outcomes. It also allows quantification of the impact of structural reforms—such as improvements in public investment and tax collection efficiency—on growth and debt dynamics.

- **Baseline scenario.** Anchored in the macroeconomic framework underlying the 2024 ECF arrangement, the baseline incorporates an ambitious fiscal consolidation to achieve a primary surplus of 2 percent of GDP by 2027—from a deficit of 4.2 in 2023—which is necessary for stabilizing public debt. The adjustment focuses on constraining recurrent expenditure, boosting domestic revenue mobilization,[7] and increasing government-funded investment spending while keeping public debt on a sustainable path. Under this scenario public investment is projected to rise from 6.5 percent of GDP in 2024 to 7.5 percent by 2026, remaining at this level thereafter.

- **Policy scenario A (Gradual Scaling-Up).** Public investment (on- and off-budget) would increase gradually from 6 percent of GDP in 2025 to 13 percent by 2029, rising by 1.5 percentage points of GDP annually. Thereafter, investment would taper down by 1 percentage point annually to converge at 7 percent of GDP (approximately the SSA average) by 2034.

- **Policy scenario B (Accelerated Scaling-Up)**. Starting from the same baseline, public investment would reach 13 percent of GDP more rapidly—by 2027—and remain at this level through 2029, before following the same declining trajectory as Scenario A from 2030 onward.

17. Under Scenarios A and B, the model incorporates structural reforms critical for ensuring that investment scaling-up translates into growth and debt sustainability (Figure 2):

- **Enhancing investment efficiency:**[8] Liberia's public investment efficiency is low, reflecting weaknesses in project design, selection, implementation, auditing and governance. Closing this efficiency gap would ensure that a larger share of every US$ spent is translated into productive public capital. Reforms to strengthen PFM, procurement practices, and independent auditing are essential to reduce resource waste and raise infrastructure quality. Importantly, scaling up investment too rapidly could exacerbate absorptive capacity constraints, reducing efficiency. Gradual scaling-up paired with institutional reforms ("investing in investments") would maximize growth returns.

[6] This model allows factoring in benefits from fiscal structural reforms of revenue (e.g. revenues efficiency) administration and public investment management (PIMA).

[7] The baseline envisages a significant increase in revenue mobilization. In the Figure 6 and 7, the revenue growth rate at the end of the program stabilizes at higher levels, close to the regional average.

[8] The Public Investment Efficiency (PIE) has been calibrated at 62 percent, following the "IMF Fiscal Affair Department Tool for Investment and Efficiency (2021). Due to the unavailability of recent PIE efficiency data for Liberia, we have adopted the average hybrid efficiency score for Sub-Saharan Africa as a proxy.

- **Enhanced tax collection efficiency.**[9] Liberia's tax collection efficiency is among the lowest in SSA/ECOWAS. Broadening the tax base and strengthening revenue administration—particularly for consumption taxes (GST and VAT once implemented), income taxes (PIT and CIT), and trade-related levies—could significantly boost revenues. The model assumes a 20-percentage point improvement in tax collection efficiency by 2030, supported by enhanced transparency in concession agreements, particularly in the extraction sector, where terms remain opaque and insistently applied.

These reforms, central to the 2024 ECF-supported program, are designed to unlock private sector-led growth while ensuring debt sustainability.

Text Table 1. Key Assumptions Under the Two Scenarios

Key policy assumptions	Scenario A	Scenario B
Scaling-up public investment	*Gradually increase from 6 percent in 2025 to 13 percent of GDP through 2029, From 2030-2034, the public investment will expected to decline to 7 percent of GDP (SSA average),.*	*Public investment will quickly rise to 13 percent of GDP by 2027 and remain there through 2029, then decline from 2030 to 2034 as in scenario A.*
Increase public investment efficiency	*Increase from 62 to 76 percent (global average) by 2036*	*Increase from 62 to 86 percent by 2030 and keep at this level through 2035.*
Donor financing adjustment	*Decrease grants from 6.7 percent of GDP to 3.9 percent in 2035.*	*Same as in Scenario A*
Change in Consumption Tax rate	*Increase GST/VAT tax rate by 3 percentage points in 2026 and remaining at this level.*	*Increase GST/VAT tax rate by 3 percentage points in 2026 and additional 3 in 2027 and remaining at this level.*
Decrease public expenditures	*From 19 percent to 12.8 percent of GDP.*	*Same as in Scenario A*
Improve tax collection efficiency	*Increase VAT C-efficiency by 20 percentage points.*	*Same as in Scenario A*

[9] Also referred to as GST/VAT C-efficiency, this indicator measures how effectively a country's VAT system collects revenue relative to its potential. In Sub-Saharan Africa, including Liberia, VAT collection efficiency remains low, contributing to underperformance in revenue mobilization. Liberia faces particularly high tax collection costs and low administrative efficiency compared to the region average. However, in the absence of recent data on Liberia's C-efficiency, the SSA average of 35 percent is used as a proxy—significantly below the global average of 51 percent.

F. Simulation Results

18. Simulation results show that the baseline investment strategy could jeopardize debt sustainability (Figure 1). Growth is projected to remain subdued at around 5 percent, despite an increase in capital spending over the next five years. This modest growth performance reflects persistent weaknesses in public investment management and tax collection efficiency. The baseline assumes constant revenue mobilization and government spending at 2024 levels. With higher revenue needs and declining external grants, GDP growth would slow further, increasing the debt burden, although gradually, while weakening Liberia's external position and heightening vulnerability to global shocks, such as rising interest rates or further decline in external support.

19. Scaling up capital spending, supported by stronger revenue mobilization and contained recurrent outlays, yields positive medium- to long-term effects on growth and debt sustainability (Figure 1). Under Scenarios A and B, investment increases initially weigh on growth due to higher taxes and reduced reliance on external grants. However, in the longer term (2026-2034), GDP growth accelerates as additional revenues create fiscal space to finance more efficient public investment. Scenario B, which front-loads capital spending, delivers slightly higher near-term growth and a faster decline in public debt relative to Scenario A, driven by stronger growth momentum.

20. When structural measures to improve public investment management and tax collection efficiency are incorporated, growth outcome strengthens further (Figure 2). As reforms take hold, growth accelerates following an initial slowdown, supported by more efficient capital spending financed through stronger domestic revenue mobilization. Consequently, the debt burden declines significantly, reflecting both higher revenues and improved growth performance. In this model, improved tax collection efficiency is assumed to generate primarily an income effect—reducing consumption without major adverse effects on labor or savings—thus imposing minimal macroeconomic costs.

21. Even though it is not explicitly captured in the model, scaling up infrastructure investment alongside structural reforms would foster economic diversification and reduce dependence on resource revenues. Strong infrastructure and improved governance would also attract both domestic and foreign private investment, supporting more broad-based and resilient growth.

22. The success of these strategies hinges critically on effective implementation of the reform agenda. While the modeled reforms have the potential to improve fiscal performance, debt sustainability, and growth, their impact will depend on robust institutional capacity, strengthened transparency and accountability, and sustained stakeholder engagement, consistent with the objectives of the AAID.

G. Conclusions and Policy Implications

23. Liberia faces significant public infrastructure gaps, which severely constrain private sector development. Scaling up public investment is critical to raising growth potential, crowding in private investment, and accelerating income convergence towards the SSA average.

24. Model simulations underscore the economic benefits of scaling up public investment under a well-calibrated framework. The DIGNAR simulations indicate that, over the five-year period of the AAID, scaling up public investment—combined with balanced financing and key structuring reforms—can enhance growth prospects while preserving debt sustainability.

25. Achieving these outcomes will require a multi-pronged approach focused on mobilizing revenues, attracting external financing (primarily grants and concessional loans), and improving investment efficiency:

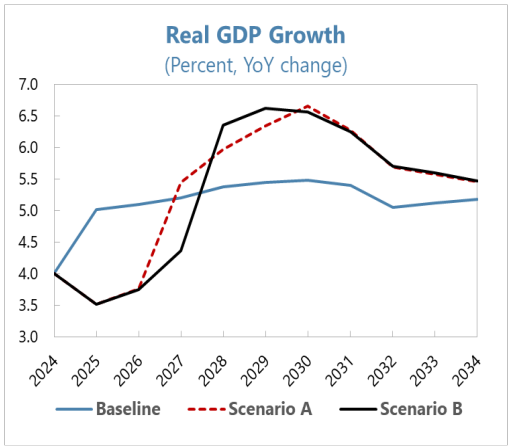
- **Increasing domestic revenue mobilization, complemented by donor and IFI financing, will be critical.** Higher domestic revenue will mitigate the debt impact of increased capital spending, while concessional external financing can reduce the risks of crowding out private investment and ensure more rigorous project selection and better financial terms. Unlike recurrent spending, productive public investment expands the economy's capital stock and fosters private sector crowding-in.

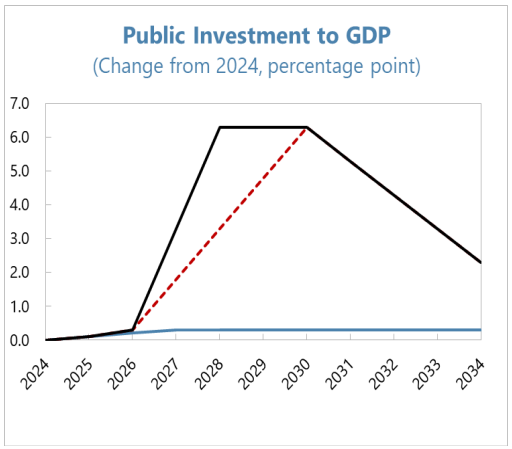
- **Strengthening tax collection efficiency is essential to complement tax rate adjustments and broaden the tax base.** Combining improved efficiency with moderate tax rate increase—aligned with regional averages—will reduce tax evasion, expand compliance, and generate sufficient resources to finance priority investments sustainably.

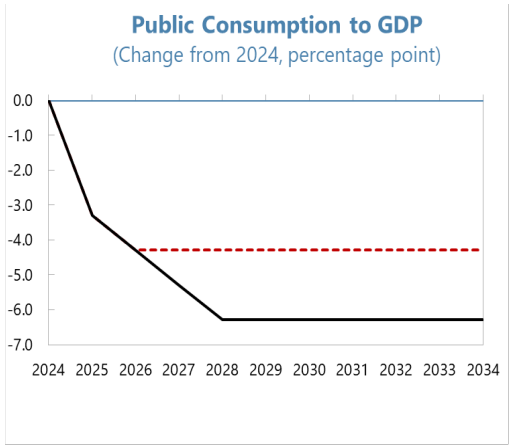
- **Structural reforms are crucial to improving public investment efficiency.** Implementing the 2025 PIMA recommendations will strengthen project appraisal, selection, and oversight, improving the cost-effectiveness of capital spending. A stronger institutional framework will also bolster donor and IFI confidence, facilitating additional concessional financing. Establishing a single project pipeline that integrates both externally and domestically financed investments will ensure that scarce resources are allocated to the most productive projects. Safeguards are also needed to prevent politically motivated projects lacking unclear economic and financial justification.

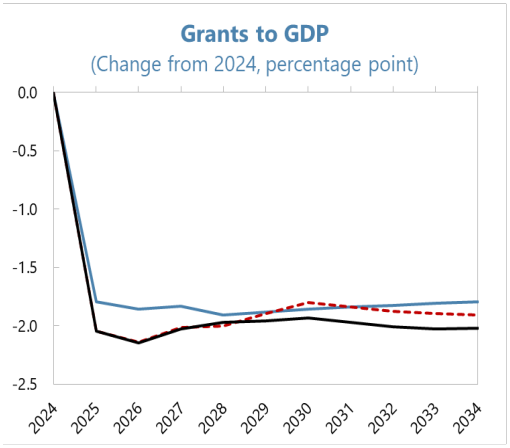
- **Modernizing public procurement is essential**. Rolling out e-procurement will enhance transparency, promote competition, and level the playing field for suppliers. A modernized procurement system also helps ensure improved value for money and address corruption risks, which remain pervasive.

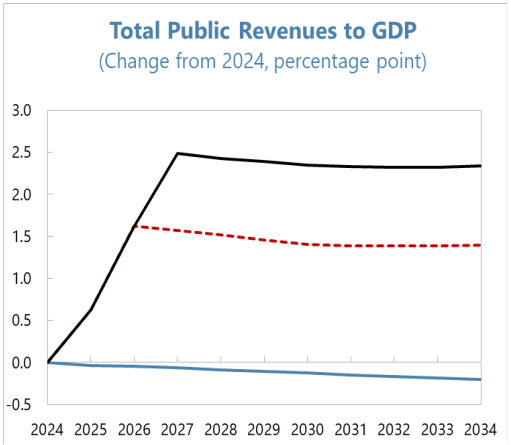
Figure 1. Liberia: Growth-Friendly Investment Scaling Up

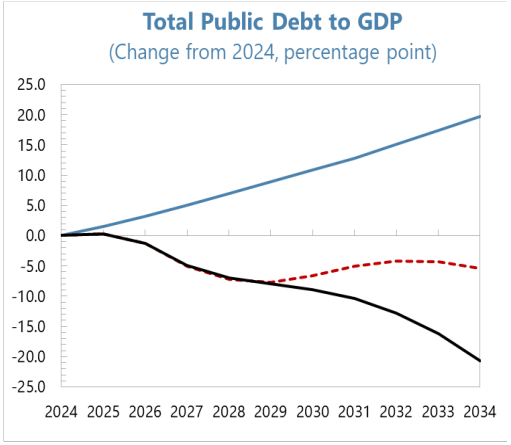






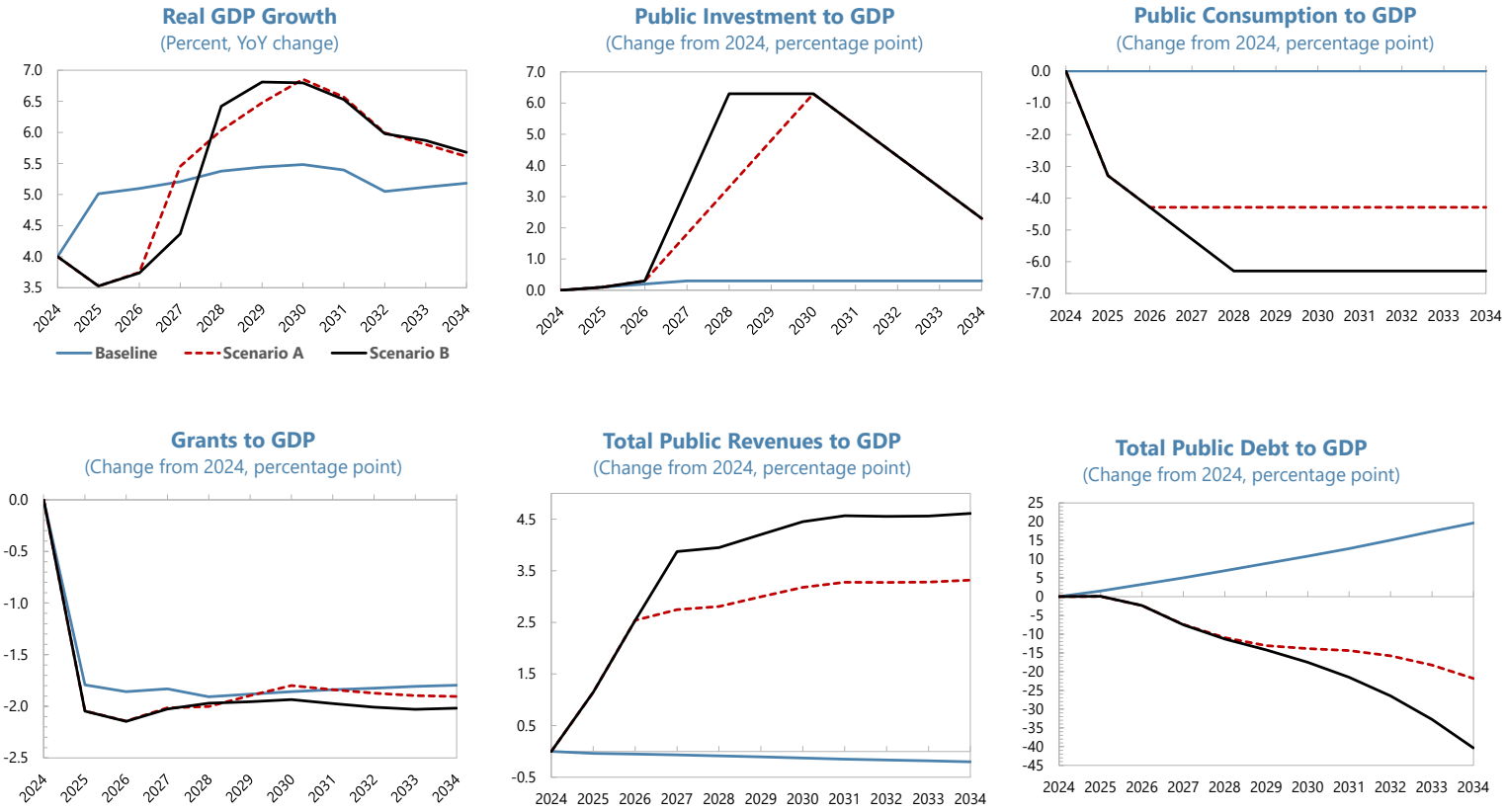






Source: IMF staff estimates and projections. Simulated using IMF DIGNAR model.

Figure 2. Liberia: Growth-Friendly Investment Scaling Up with Structural Reforms



Source: IMF staff estimates and projections. Simulated using IMF DIGNAR model.

Appendix I. Calibration of Initial Steady-State for the Case of Liberia

Variables	Value
GDP growth rate (in percent)	4.0
Exports/GDP*100 (in percent)	31.6
Imports/GDP*100 (in percent)	61.7
Public consumption/GDP*100 (in percent)	19.1
Public investment/GDP*100 (in percent)	6.7
Private investment/GDP*100 (in percent)	11.1
Mining value added (natural resource production)/GDP*100 (in percent)	11.1
Public domestic debt / GDP*100 (in percent)	21.8
Concessional debt/GDP*100 (in percent)	31.9
Public external commercial debt/GDP*100 (in percent)	1.9
Grants/GDP*100 (in percent)	6.7
Total public revenues/GDP*100 (in percent)	13.4
Foreign aid to GDP ratio (in percent)	10.2

Sources: Liberia Authorities and IMF estimates

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BUILDING RESILIENCE TO NATURAL DISASTERS AND CLIMATE CHANGE RISKS IN LIBERIA: IMPLICATIONS FOR GROWTH AND DEBT SUSTAINABILITY[1]

The SIP outlines the climate change challenges facing Liberia and illustrates macroeconomic implications of climate-related shocks, highlighting the critical role of fiscal reforms and adaptation infrastructure in strengthening economic resilience and safeguarding debt sustainability. Simulations using the IMF's Debt-Investment-Growth-Natural-Disasters (DIGNAD) model suggest that ex-ante public investment in climate-resilient infrastructure mitigates macroeconomic cost of natural disasters and promotes resilient growth. Complementary fiscal reforms, including domestic revenue mobilization and improved investment efficiency, help ease the growth-debt tradeoff associated with adaptation investment and foster resilient and sustainable growth. To advance its ambitious climate agenda, Liberia must accelerate the implementation of necessary reforms.

A. Introduction

1. Climate change poses significant risks to macroeconomic stability and long-term growth in Liberia. The impacts of rising temperatures, shifting rainfall patterns, and increasing frequency of extreme weather events threaten key sectors such as agriculture, infrastructure, and public health. Climate-related natural disasters as well as changing climate conditions can disrupt agriculture production, potentially increasing food insecurity and poverty levels, while also putting upward pressure on domestic food prices. Additionally, the destruction of physical infrastructure from natural disasters can exacerbate existing vulnerabilities, displacing communities, and straining fragile systems. Such disruptions may undermine economic growth and increase public spending on disaster recovery, threatening public finances, and external sustainability. Furthermore, adverse effects on public health and education can diminish human capital, reducing long-term economic growth. Though Liberia is currently not a drought-prone country, incidents of drought and concentrated rainfall patterns are expected to increase with climate change in the future, negatively affecting water management and energy production (hydropower electricity generation) (World Bank, 2024b).

2. Against this background, it is crucial for Liberia to develop and implement structural policies aimed at building resilience against climate-related disasters and climate change risks. Addressing climate risks is essential for ensuring Liberia's macroeconomic stability, long-term balance of payments stability, debt sustainability, and long-term sustainable growth. By proactively investing in climate adaptation measures and resilient infrastructure, Liberia can mitigate the

[1]Prepared by Thabang Molise, Chen Chen, Frank Zhang, Azar Sultanov, Tsendsuren Batsuuri, George Cui, and Miguel Eduardo Otero Nule. The authors acknowledge valuable comments and feedback provided by the AFR Climate Working Group and the Liberia Climate Policy Diagnostic (CPD) mission team. Special thanks are due to Mariza Montes de Oca Leon for her assistance in putting together climate-related charts.

economic impacts of climate-related disasters, safeguard fiscal and debt sustainability, and support long-term resilient growth.

3. The objective of the paper is two-fold. First, it presents an overview of the main climate change vulnerabilities in Liberia and challenges in implementing climate change initiatives. Second, it assesses the macroeconomic implications of climate-related (natural disaster) shocks and the role of climate change adaptation policies in safeguarding macroeconomic stability and promoting resilient and sustainable growth. It examines the macro-fiscal implications of natural disaster shocks and the benefits of scaling up public investment in natural disaster-resilient infrastructure in safeguarding macroeconomic stability and promoting resilient and sustainable growth, under a range of financing options.

B. Vulnerability to Natural Disasters and Climate Change Risks

4. Liberia has historically been highly vulnerable to climate-related natural disasters, and climate change is expected to further increase their frequency and intensity. Major natural disasters include heavy rainfall and flooding, as well as storms (figure 1, panel 1). These impactful events have historically caused widespread infrastructure damage and affected large segments of the population (figure 1, panel 2). The data on damage to physical capital are largely lacking in Liberia, but available reports on specific events suggest average annual direct capital losses of about US$20 million in the Greater Monrovia area of the country as a result of flooding.[2] The IMF's cross-country study suggests that an average flood event in developing countries like Liberia can reduce growth by an average of 1.0 percentage point, over the two years following the shock, and drive up government spending by up to 3.2 percentage points (Nguyen et al., 2025). Liberia is highly vulnerable to coastal flooding and sea erosion too, with its 560 km coastline stretching the entire length of the country (out of a land area of about 111,369 km^2). A significant percentage of the population resides in low-elevation coastal zones, further increasing the country's exposure to these disasters. With climate change, Liberia is likely to experience more frequent extreme rainfall episodes and coastal flooding due to ever rising sea levels.[3]

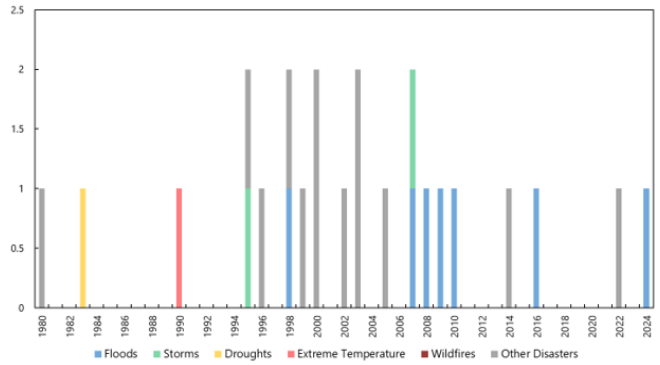
5. Liberia is among the world's most vulnerable countries to climate shocks and ranked the lowest among countries in terms of readiness to cope with such shocks. According to the IMF-adapted ND-GAIN Index, Liberia is ranked the 30th most vulnerable country to climate change in 2023, placing at 158th out of 187 countries. This high level of vulnerability is exacerbated by limited and inadequate adaptation efforts. Weak institutional capacity and inadequate infrastructure further hinder Liberia's ability to implement effective adaptation measures. The IMF-adapted ND-GAIN index suggests that Liberia ranks 147th out of 192 countries in 2022 in terms of readiness to adapt, underscoring significant challenges in its capacity for effective response (Figure 1, panels 3-4).

[2] World Bank (2020) "Liberia - Urban Resilience Project". Washington, D. C., World Bank Group.

[3] The World Bank (2024a) suggests that the average number of days with heavy rainfall (>20 mm) could increase by an average of six days, under the optimistic emission scenario, by 2050.

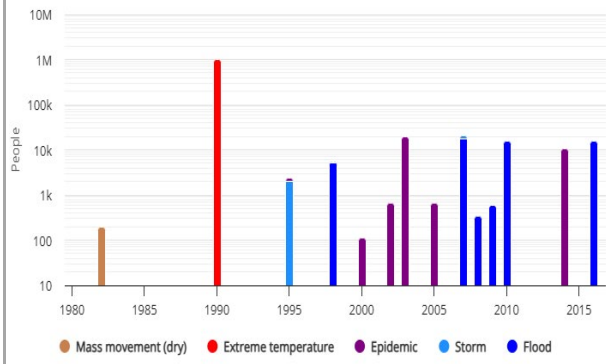
Figure 1. Liberia: Climate Indicators

Key Natural Hazard Statistics (1990 – 2024)
(Number of occurrences)



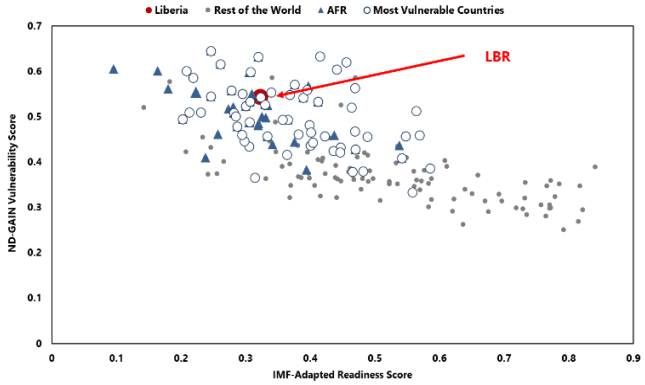
Sources: EM-DAT, CRED/UCLouvain, Brussels, Belgium, IMF Climate Change Indicators Dashboard

Key Natural Hazard Statistics (1980 – 2024)
(Number of People Affected)



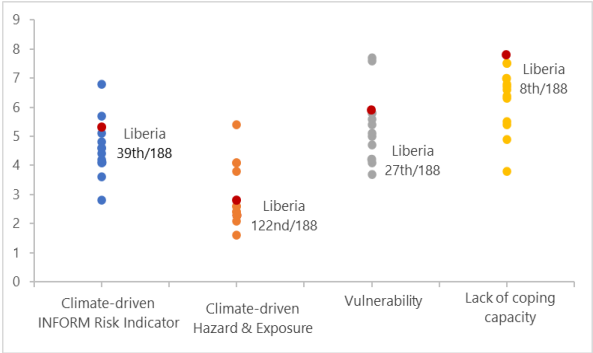
Sources: World Bank Climate Change Knowledge Portal

Climate Risks and Readiness (ND-GAIN, 2022)



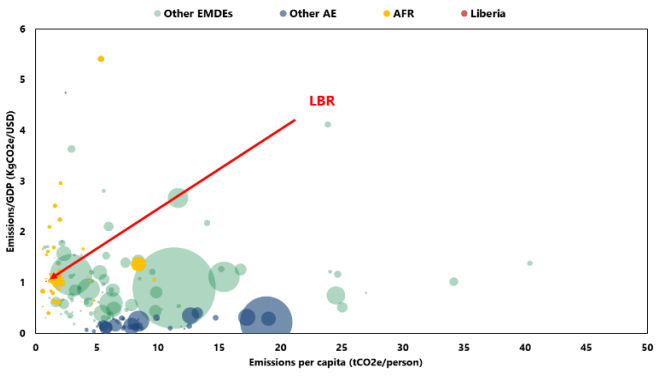
Sources: IMF Climate Change Indicators Dashboard (2022)
Note: The Vulnerability Score assesses a country's current vulnerability to climate reflecting exposure, sensitivity, and adaptive capacity. The Readiness Score assesses a country's readiness t leverage public and private sector investment for adaptative actions.

Climate Vulnerability and Coping Capacity in Liberia and West Africa (2022)



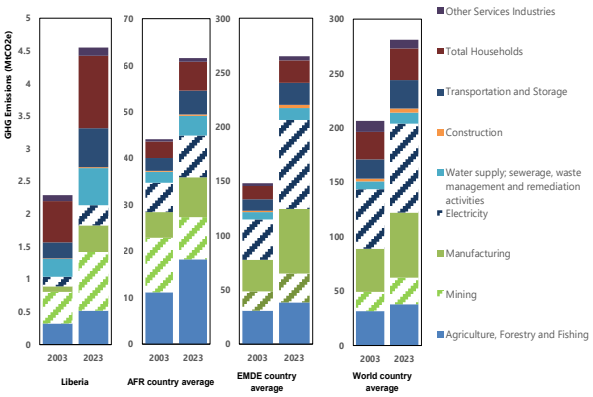
Sources: INFORM Risk; IMF Climate Change Indicators Dashboard, IMF staff calculations.
Index: Scale from 0-10. The higher the indicator the higher the risk.
Each dot represents a West African country (*Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, The Gambia, Ghana, Guinea, Liberia, Niger, Nigeria, Senegal, Sierra Leone, Togo*).

GHG Emissions Intensity Vs. Total Emissions, 2023



Sources: IMF Climate Change Dashboard (2023) and IMF World Economic Outlook (WEO).
Note: Bubble size indicates total GHG emissions excluding land-use, land-use change, and forestry Outliers are excluded.

Emissions by Sector



Source: OECD Air Emission Accounts; UNFCCC; EDGAR; IMF staff calculations.
Note: GHG emissions excluding land-use and land-use change, and forestry are shown. Rather than presenting the air emission by UNFCCC sector, the chart above classifies emissions by economic activity.

6. Yet, the country is contributing little (negligibly) to global greenhouse gas (GHG) emissions. In 2021, the country was estimated to have contributed about 0.03 percent of global GHG emissions, placing it at 130th largest emitter out of 198 countries (World Bank, 2024a). The main contributors of GHG emissions include household, mining, transport and water sectors, together accounting for about 70 percent of Liberia's GHG emissions (Figure 1, panel 6).

7. The agriculture sector, the largest economic sector, is particularly vulnerable to climate change risks. The sector employs around 41 percent of Liberia's population and accounts for about a third of the country's GDP (World Bank, 2024b). Climate change-related setbacks—such as rising temperature and extreme weather events, especially heavy rainfall and floods—disrupt agricultural activities by reducing crop production and increasing livestock losses. These would have negative implications for food security and poverty, especially in the medium to long term, given that about two-thirds of Liberia's population depend on agriculture for livelihoods. The rising sea temperatures and coastal erosion are degrading marine and coastal/oceanic ecosystems, thereby reducing productivity of the fishery sector. Furthermore, against the backdrop of Liberia's rudimentary social protection programs (social safety nets), climate shocks would disproportionately affect the poorest and most vulnerable households, further exacerbating existing inequalities and pushing more people into extreme poverty.[4]

8. Climate change-induced rising temperature strains human capital and reduces the country's productivity. Heavy rainfall and high temperatures exacerbate Liberia's already high rate of vector-borne and waterborne diseases such as cholera, malaria, yellow fever, schistosomiasis, and diarrheal diseases (World Bank, 2024b). Additionally, heavy rainfall and high temperatures could disrupt school attendance, potentially undermining human capital development. Water contamination and disease outbreaks linked to limited access to sanitation and waste management tend to spike during heavy flooding episodes. Higher temperatures will increase heat stress and reduce the productivity of outdoor labor.

9. The country's limited physical infrastructure, including land, and other sectors like tourism are also susceptible to climate change risks. Heavy rainfall, flooding, rising sea level and coastal erosion can inflict economic losses by damaging physical infrastructure and disrupting production in sectors like tourism, which are key for economic development. Liberia is particularly vulnerable to rising sea levels and coastal flooding, with approximately 60 percent of its population and much of its infrastructure concentrated in coastal areas. The rising sea level and coastal erosion reduces coastal areas available for tourism development and undermine the sector's long-term growth prospects.

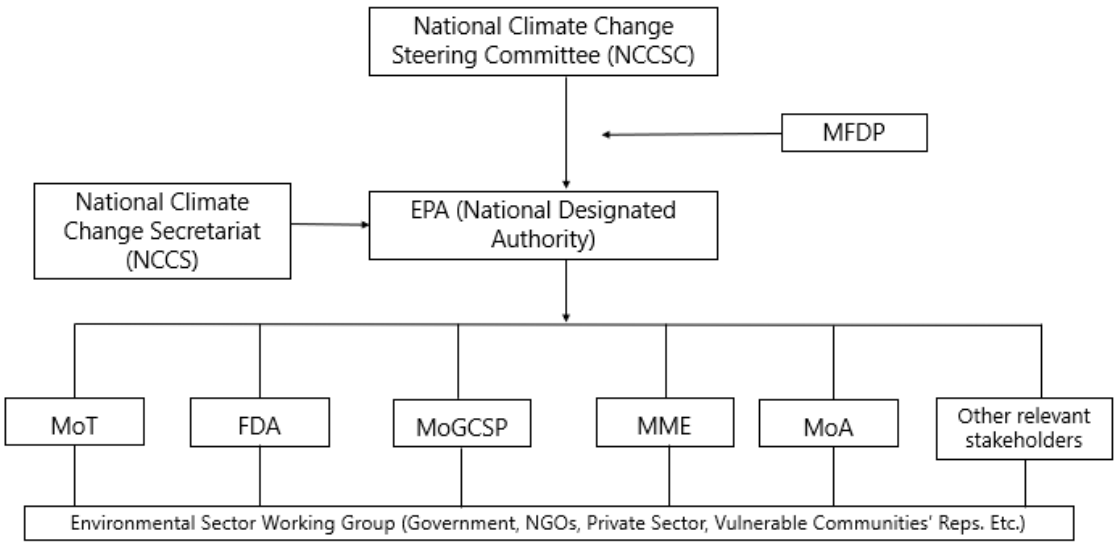
[4] Liberia's current social protection programs are characterized by limited coverage, low funding, and inadequate benefit levels (IMF, 2019; Liberia, 2025a). These limitations, together with a heavy reliance on external donor support, undermines long-term sustainability and weakens the government's ability to provide adequate support to vulnerable populations, especially during crisis.

C. National Climate Change Institutional and Policy Frameworks

10. Liberia has established various institutions to help implement and coordinate climate change initiatives. Key institutions across all sectors at both national and sub-national levels include National Climate Change Steering Committee (NCCSC), National Climate Change Secretariat (NCCS), Environmental Protection Agency of Liberia (EPA), Environmental Sector Working Group (ESWG).

- **NCCSC** is the overarching institutional structure mandated to coordinate and supervise the implementation of the climate change policy.
- **NCCS** serves as the operational arm of the NCCSC and provides coordination, and monitoring and evaluation. It coordinates climate change-related activities, accesses information, monitors key programs and activities, and promotes inter-institutional cooperation.
- **EPA** is the regulatory agency responsible for ensuring sustainable usage, management and protection of the environment and its natural resources.
- Other stakeholders include Ministry of Transport (MoT), and Forestry Development Authority (FDA), Ministry of Gender, Children and Social Protection (MoGCSP), Ministry of Mines and Energy (MoME), Ministry of Agriculture (MoA), Ministry of Finance and Development Planning (MFDP), Environmental Sector Working Group (consisting of private sector, civil society, non-governmental organization, etc.) and other relevant sectoral institutions indicated in the Action Plan through the NCCSC.

Text Figure 1. Institutional Arrangement for Climate Change in Liberia



Source: EPA, 2021, Liberia's Second National Communication to the UNFCCC.

11. Liberia's key climate action strategies and policies are largely outlined in National Policy and Response Strategy for Climate Change (NPRSCC, 2018), Revised (Second) Nationally Determined Contributions (NDC, 2021) and National Adaptation Plan 2020-30 (NAP, 2022).[5] These policy documents, which also align with Liberia's National Vision 2030, set out the country's policy frameworks, action plans, and priority areas or sectors (including mitigation and adaptation measures) to address climate change risks. The new National Development Plan (ARREST Agenda for Inclusive Development, AAID) strategies to tackle challenges of climate change also aligns with the aforementioned policy frameworks.

- The **NPRSCC** provides a comprehensive framework for addressing climate change in Liberia. It focuses on strengthening coordination among stakeholders and enhancing institutional capacities to implement climate change policies in Liberia. It creates an overarching framework for integrating climate considerations into national development policies, while also considering other regional and international policies and frameworks (e.g., the Paris Agreement and Sustainable Development Goals).
- The **NDC**, revised in 2021, sets the country's mitigation and adaptation targets for priority sectors including agriculture, forests, coastal zones, fisheries, health, transport, industry, energy, and waste sectors. It targets a 64 percent reduction in GHG emissions (relative to the projected business-as-usual scenario) by 2030. The third NDC (NDC 3.0) is currently being prepared.
- **NAP** (2020-30) identifies the country's medium- and long-term adaptation needs (outlines the country's ten-year adaptation plan), with the aim of developing and implementing strategies and programs to address those needs. These adaptation needs and programs are consistent with the short- and long-term (2025 and 2030) adaptation targets, actions and policy measures set out in the revised NDC.
- To comply with the requirements of international agreements, Liberia has also issued its **NDC, Second National Communication (SNC), and first adaptation communication (AdCom)** to the United Nations Framework Convention on Climate Change (UNFCCC).

D. Challenges in Implementing Climate Change Initiatives

12. Though Liberia's climate change policies and frameworks are generally aligned with the best international practices, the implementation of its climate action plans faces challenges. These include limited financial resources, delays in disbursement of committed funds, capacity constraints at both national and local levels, weak coordination among implementing agencies, and gaps in climate data, monitoring and evaluation systems.

[5] Other key climate action strategies and policies include (i) National Forest Policy and Implementation Strategy, (ii) Wildlife Conservation and Protected Area Management Law, (iii) National Conservation Strategy, (iv) National Solid Waste Policy of Liberia, (v) National Agriculture Development Plan (NADP) 2024-2030, and (vi) Revised Energy Policy of Liberia.

- While institutional arrangements for the implementation of the national climate agenda are described, there is no clear framework for engaging non-government stakeholders, or developing capacities needed to implement the NDC (Liberia, 2025b).

- Climate-related data and early warning systems in Liberia remain nascent. Planning and resource allocation are not evidence-based due to limited data and knowledge of current climate risks and anticipated climate change impacts.

- The financial support required to meet the mitigation and adaptation goals remains insufficient. Of the US$490.6 million investment requirements to achieve its NDC mitigation and adaptation targets over the period 2021-25, 11 percent has been fully supported while the remaining 87 percent remains unsupported (Liberia, 2025b). Relatedly, greater emphasis is on mitigation (with US$400.6 million allocated to mitigation and US$89.9 million to adaptation needs) despite being a lower GHG emitter and highly vulnerable to natural disasters and climate change risks.[6] World Bank (2024a) suggests that the US$490.6 million estimated cost is likely underestimated, considering a modest allocation for adaptation. Adaptation interventions require more resources than currently outlined in the NDC (World Bank, 2024a). With limited domestic revenues and dwindling foreign aid, Liberia would need to prioritize the development of a robust and sustainable climate financing strategy to achieve its ambitious climate agenda.

- Other challenges include inadequate information and low awareness of climate change risks among various segments of the population, especially in rural communities, and insufficient urgency and political will to address climate change risks (IMF, 2022).

13. The 2025 C-PIMA identified some gaps in climate resilience of the public investment management (PIM) framework. Coordination across all levels of the public sector remains weak, and the current oversight framework for state-owned enterprises (SOEs) investment planning is not aligned with national climate objectives. Climate change considerations are not sufficiently integrated into the national and sectoral investment planning process, thus risking misalignment between major infrastructure projects and NDC commitments. Climate change initiatives are not reflected in project appraisal, selection, and budgeting processes while the PPP frameworks overlook climate risks. Additionally, Liberia does not have a coherent framework for tracking, monitoring and reporting climate-related public investment expenditures.

14. These barriers hinder the timely and effective execution of planned mitigation and adaptation measures, despite growing political commitment and institutional reforms. Addressing these implementation challenges is critical for Liberia to achieve its climate change agenda as outlined in its NDCs. This will also help build long-term climate resilience.

[6] The stronger focus on mitigation may have been driven by the country's ambitious commitment in its revised NDC (NDC 2.0) to reduce GHG emissions by 64% below the projected business-as-usual level by 2030. This emphasis may also reflect limited awareness of (i) the country's vulnerability to climate change risks, and (ii) the macro-criticality of climate-related natural disasters. NDC 2.0 lacks detailed information on the country's vulnerability to climate change risks.

E. Macroeconomic Implications of Natural Disasters and the Role of Climate Resilience Policies

15. We use the DIGNAD (Debt, Investment, Growth, and Natural Disasters) model (Marto et al., 2018) to analyze the macro-fiscal implications related to investing in disaster-resilient infrastructure in Liberia. The DIGNAD model extends the earlier DIG (Debt-Investment-Growth) model (Buffie et al., 2012) to include the dynamics of natural disasters and public investment plans of different kinds.[7] In the model, investments in infrastructure could be enhanced by boosting resilience to natural disasters, characterized by a lower depreciation rate than that of standard infrastructure and by reduced post-disaster damage due to greater durability. The model incorporates natural disaster as an exogenous shock that affects the economy through different channels, such as permanent destruction of capital, temporary reduction in total factor productivity, and other disruptions.

16. The model is calibrated specifically to match the main macroeconomic indicators of the Liberian economy. The calibration of initial values and parameters are derived from historical averages to reflect Liberia's steady state as observed in the data. Considering that floods constitute the predominant natural disaster in Liberia and are projected to increase in frequency and severity, we calibrate the model to reflect the anticipated consequences of a large-scale hypothetical flood event in 2030. Due to data limitations in Liberia, we rely on average estimates of the impact of extreme weather events (e.g., floods and storms) in the context of fragile and conflict-affected states (FCS), based on Jaramillo et al. (2023). Their findings suggest that such events can result in cumulative GDP losses of up to 4 percent in the context of FCS. Considering capital-to-GDP ratio in Liberia[8], this translates to around 2 percent of capital loss on annual basis in the country. The Public Investment Efficiency (PIE) is calibrated at 62 percent, based on the 2016 PIMA report for Liberia.[9] This figure aligns closely with the average PIE observed for Sub-Saharan African countries. Other parameters, especially those for which Liberia-specific data are unavailable, are calibrated based on the literature, especially in the context of low-income countries in Sub-Saharan Africa. Text table 1 shows the calibrated values of the main parameters.

17. We conduct experimental simulations to evaluate macroeconomic responses of the country to natural disasters, under different investment and financing arrangements. In all scenarios, the model assumes an investment program scheduled to commence in 2025, with an expected implementation duration of five years. A natural disaster is simulated to occur immediately following the accomplishment of the public investment program in 2030.

[7] DIGNAD is a dynamic general equilibrium model that enables an assessment of how key macroeconomic variables evolve with different investment plans, such as growth, debt, and private consumption and investments, as risks of a natural disaster materialize. The analysis is conducted by calibrating the DIGNAD model using the DIGNAD toolkit by Aligishiev, Ruane and Sultanov (2023).

[8] According to the IMF's Investment and Capital Stock Database in 2024, the capital-to-GDP ratio in 2024 in Liberia is about 250 percent.

[9] The 2025 C-PIMA could not provide PIE efficiency data for Liberia due to data challenges.

Reconstruction efforts are assumed to commence in the same year as the disaster, with a four-year recovery program to restore public capital. Furthermore, we evaluate various financing options for both the scaling up of investments and post-disaster reconstruction, encompassing a combination of domestic and external debt (both concessional and commercial), domestic revenue mobilization, and specialized lending programs from international partners.

- **Scenario 1: Investment scale up in standard infrastructure.** This scenario assumes additional investments in standard infrastructure starting in 2026 till 2029, increasing gradually from a baseline level of 6 percent of GDP in 2025 to 7.5 percent in 2027 and remains at same level until 2029. Financing is assumed to come from concessional borrowing from international partners, while post-disaster reconstruction will be funded through a combination of domestic and external commercial borrowing. This scenario serves as a baseline to assess the extra costs and benefits of disaster-resilient investment.
- **Scenario 2: Investment scale up in disaster-resilient infrastructure:** Scenario 2 follows Scenario 1 but assumes same rate of additional investment is allocated entirely to disaster-resilient infrastructure (i.e. from 6 percent of GDP in 2025, to 7.5 percent in 2027 and stays the same until 2029). Similar to Scenario 1, this disaster-resilient investment is financed by concessional borrowing, and the post-disaster reconstruction is financed by domestic and external commercial borrowing.
- **Scenario 3: Investment scale up in disaster-resilient infrastructure with consumption tax (Value Added Tax (VAT)) reform.**[10] In Scenario 3, the authorities implement the same ex-ante investment plan for disaster-resilient infrastructure as outlined in Scenario 2, financed through concessional borrowing. Additionally, a moderate VAT reform will be introduced in 2026, increasing the consumption tax from 12 percent to 15 percent, to align with Liberia's domestic revenue mobilization objective under the current ECF program.
- **Scenario 4: Further investment scale up in disaster-resilient infrastructure with enhanced VAT reform, Public Investment Efficiency (PIE) reform, and RSF financing.** In this scenario, the authorities decide to implement a robust investment scale up with the disaster-resilient infrastructure investment that gradually improves from 6 percent of GDP in 2025 to 13 percent of GDP in 2029[11]. This investment scale-up plan is assumed to be financed through a combination of concessional borrowing, including under IMF's Resilience and Sustainability Facility (RSF). Concurrently, an enhanced VAT reform will increase consumption tax from 12 percent to 18 percent beginning in 2026, together with a PIE reform aimed at increasing public investment efficiency from 62 percent to 82 percent.[12] This scenario features stronger

[10] The exercise aligns with the authorities' plan to replace the current Goods and Services Tax (GST), set at 12 percent, with a VAT at a relatively higher rate of 15 percent over the medium term. Since DIGNAD model does not differentiate between VAT and GST—treating both as general consumption taxes—the proposed reform is consistent with an increase in consumption taxation, in line with the model's framework.

[11] More specifically, 6 percent of GDP in 2025, 7 percent in 2026, 9 percent in 2027, 11 percent in 2028, and 13 percent in 2029.

[12] Additional background on Liberia's public investment management challenges—including execution capacity and cross-country comparisons—is provided in Selected Issues Paper I (SIP I).

efforts from authorities to mobilize domestic revenue and improve public investment efficiencies, thereby offering greater potential to support the budget and alleviate public debt stress in comparison to Scenario 3.

18. The simulation results suggest ex-ante public infrastructure investment has a positive effect on economic growth prior to the natural disaster. Text Figure 2 demonstrates the dynamic macroeconomic responses of the modeled economy across the four scenarios. With the proposed investment scale-up plans, real GDP growth rises about 0.5 percent in Scenarios 1-3 and 1.4 percent in Scenario 4 (stronger investment scale-up) at peak before natural disasters occur. The growth improvement can be attributed to two factors: a direct impact resulting from accelerated public investment, and an indirect impact stemming from the crowding-in of private investment, spurred by higher investment returns (Text Figure 2, panel 3).

Text Table 1. Calibrated Parameters and Initial Values (in percent)

Definition	Value
Initial return on standard infrastructure investment*	25.00
Initial return on adaptation infrastructure investment*	30.00
Public infrastructure investment to GDP ratio	6.00
Grants to GDP ratio	6.70
Consumption tax rate (VAT)	12.00
Labor income tax rate	20.00
Public domestic debt to GDP ratio	21.80
Public external concessional debt to GDP ratio	31.90
Public external commercial debt to GDP ratio	1.85
Remittances to GDP ratio	0.07
Real interest rate on public domestic debt	2.11
Real interest rate on public external commercial debt	3.50
Depreciation rate of public capital (standard infrastructure)*	7.50
Depreciation rate of public capital (disaster-resilient infrastructure)*	3.00
Efficiency of public infrastructure investment	62.00

Source: IMF staff calculations.

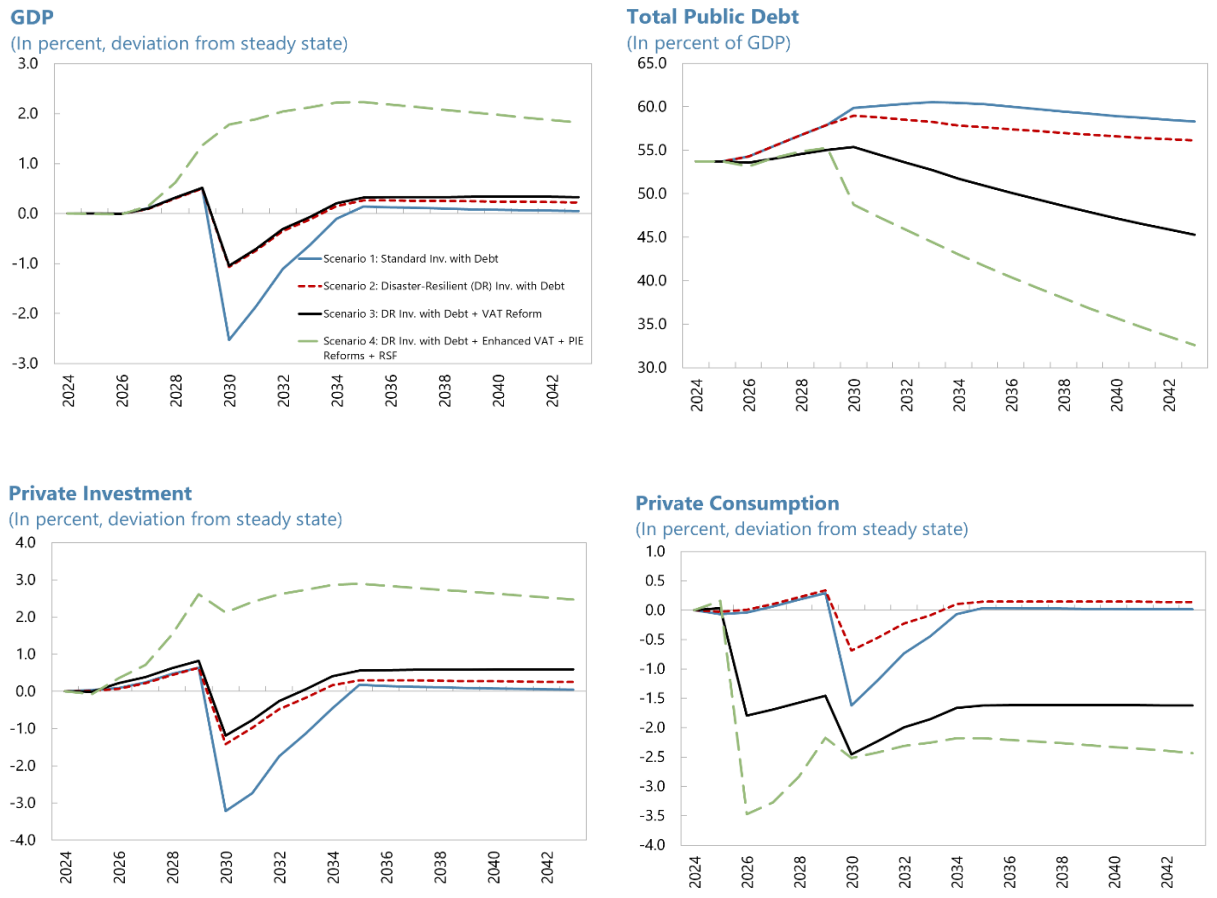
Notes: * These parameters are based on the literature (e.g., Buffie et al., 2012; Marto et al., 2018). The rest of the parameters are based on historical averages of Liberia's macroeconomic data for the period 2021-24 and the 2016 PIMA report for Liberia.

19. Investing in disaster-resilient infrastructure is expected to attenuate the damage of natural disasters and reduce public debt stress stemming from the financial needs of post-disaster reconstruction. In Scenario 1, with the moderate scaling up of investment in standard infrastructure, the occurrence of a natural disaster results in a real GDP loss, up to 2.5 percent compared to the steady state, alongside an elevated public debt level at approximately 60 percent. In contrast, the equivalent level of investment in disaster-resilient infrastructure (Scenario 2) leads to a significantly smaller decline in GDP and maintains a lower debt level. Additionally, the negative impacts of natural disasters on private investment and consumption are lessened with more resilient infrastructure (Text Figure 2, panels 3-4). A comparison of Scenarios 1 and 2 highlights the

benefits of adaptation investment, which provides both a mitigating effect of the shock and lower public financing needs during post-disaster recoveries. This dual benefit helps safeguard the economy from natural disasters in both the short and long term.

20. Domestic revenue mobilization through VAT reform necessitates trade-offs between debt sustainability and private consumption. The differences between Scenarios 2 and 3 reflect the impacts of the 3 percent permanent increase of the consumption tax. While the real GDP and private investment is merely affected, introducing a higher consumption tax generates more government revenue and diminishes the financing needs through public debts. However, this improvement is at the expense of persistently lower private consumption—up to 1.8 percent below its steady state level prior to the occurrence of natural disaster and 1.6 percent when reconstruction needs arise post-disaster.

Text Figure 2. Simulation Results Using DIGNAD Model



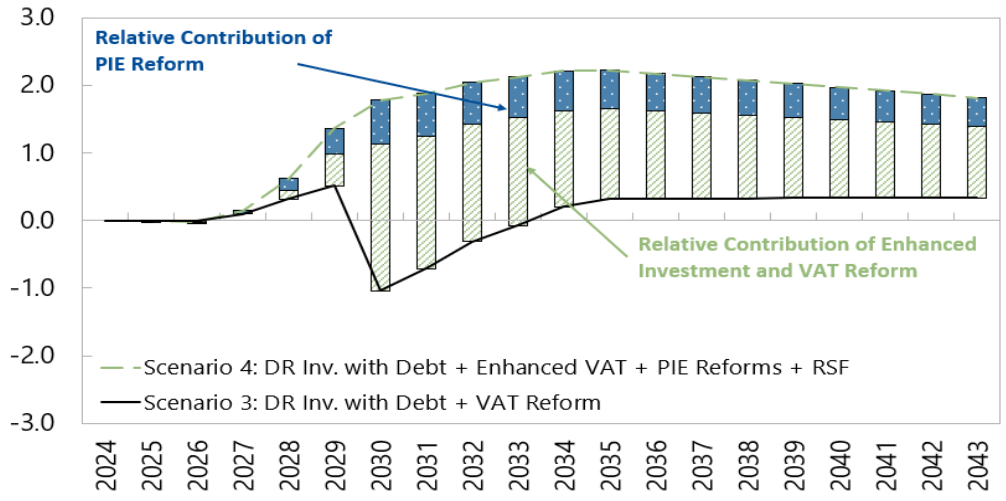
Source: Staff calculations. "DR" refers to "Disaster-Resilient" in the charts.

21. An enhanced ex-ante disaster-resilient investment scale-up, together with an enhanced reform package comprising PIE and VAT reforms, lead to a broadly stronger economy. Scenario 4 describes a policy package that requires greater efforts from within the

country, featuring higher consumption tax rates and improved public investment efficiency. International support, such as funding available under the IMF's RSF arrangement, is also assumed in this scenario that allows additional fiscal space for ambitious investment spending. The combination of these domestic efforts and external supports would potentially enable the authorities to undertake a more ambitious disaster-resilient investment strategy. The simulation results suggest that strong public investment in disaster-resilient infrastructure significantly increases growth trajectory before disaster occurs, with real GDP increasing by about 1.4 percent above the steady state level. Similarly, private investments are also much higher in this scenario, due to the crowding-in effect. Meanwhile, enhanced revenue mobilization facilitates a more modest increase in total public debt compared to other scenarios, while simultaneously fostering the development of disaster-resilient infrastructure. But this comes at a cost of lower private consumption due to higher consumption tax rate. Compared to Scenarios 1 and 2, the total debt level is 2.5 percentage points lower in Scenario 4 before the occurrence of the natural disaster. In Scenario 4, decomposing the GDP impact into two main sources—strong investment in disaster-resilient plus VAT reform vs. the PIE reform—shows that most of the gains are driven by strong investment in adaptation infrastructure plus VAT reform (Text Figure 3).

Text Figure 3. Scenario 3 vs. 4–GDP Decomposition

(Percent, deviation from steady state)



Source: Staff calculations. "DR" refers to "Disaster-Resilient" in the charts.

22. The enhanced reform package also results in more robust macroeconomic responses both during and after the occurrence of the natural disaster, contributing to improved debt sustainability in the long term. With increased investment in disaster-resilient infrastructure, the impact of a natural disaster is significantly mitigated in Scenario 4. When the shock occurs, the adverse impact on real GDP growth is largely restrained, compared to 2.1 percent decline in Scenario 3, with similar improvements observed in private investment. Furthermore, because of the durability of disaster-resilient infrastructure, Scenario 4 exhibits a stronger post-disaster recovery. This is characterized by substantially higher long-term growth, increased private investment, and a more sustainable and

declining public debt path. In 2035, the public debt level is projected to be 9.2 percentage points lower than that in Scenario 3, and 12 percentage points lower than the initial level.

F. Conclusion and Policy Recommendations

23. Liberia is making progress in building resilience to climate-related disasters and climate change risks, but the pace remains slow, and challenges persist. While the country has strengthened its policy and institutional frameworks to support the implementation of the national climate agenda, greater efforts are needed to mobilize financial resources, secure implementation support, build capacity at both national and local levels, enhance coordination among implementing agencies, and address gaps in climate resilience of the public investment management (PIM) framework.

24. Building resilience to natural disasters and climate change risks is crucial for safeguarding long-term economic stability and promoting resilient growth. In this context and to make meaningful progress in advancing the country's ambitious climate agenda, key priorities would include:[13]

- **Prioritizing targeted adaptation measures, while leveraging synergies with mitigation where possible.**[14] Considering Liberia's minimal carbon footprint, limited resources, and high vulnerability to climate-related natural disaster shocks, the focus should be on adaptation measures while leveraging synergies with mitigation where feasible. For example, the implementation of energy policies supporting a transition to a low-carbon economy can also enhance adaptation by improving energy access and system resilience.

- **Boosting public investment in climate-resilient infrastructure and enhancing public investment efficiency.** The analysis suggests that ex-ante public investment in such infrastructure mitigates macroeconomic cost of climate-related natural disaster shock and promotes resilient growth. Investing in climate-resilient infrastructure not only boosts economic growth before disasters—by increasing capital accumulation and crowding in private investment—but also reduces the negative effects of natural disasters. Fiscal reforms to enhance public investment efficiency usefully reinforce the benefits of investing in climate-resilient infrastructure. In this context, swift implementation of the recommendations of the recent C-PIMA TA would be critical. Broadly, these would strengthen the capacity of the authorities and institutions to integrate climate considerations into investment planning, project appraisal and selection, budgeting preparations, and the management of adaptation projects.

- **Adopting a pragmatic and multi-pronged approach to climate financing, given Liberia's limited fiscal space, high reform costs and debt concerns**. Developing a concrete financing plan, with a clear public and private sector financing mechanisms to meet Liberia's climate targets is

[13] For reform opportunities in other areas, please see the forthcoming 2025 Liberia Climate Policy Diagnostic Report.

[14] This does not imply overlooking at mitigation measures. Despite Liberia's low contribution to global emissions, mitigation policies would help align incentives towards sustainable production modes in key sectors such as energy and forestry sectors.

crucial. In the short to medium term, reforms to enhance domestic revenue mobilization, as well as measures to strengthen public spending efficiency, can help create fiscal space to bolster public investment in adaptation infrastructure, while preserving debt sustainability. Additionally, the authorities could leverage external concessional financing including through climate funds along with potential utilization of the IMF's Resilience and Sustainability Trust (RST) for regulatory reforms. In the medium to long term, Liberia could consider issuing climate-linked debt instruments and climate-related insurance schemes. While carbon credit schemes may seem like an attractive option for Liberia given its vast rainforest cover, the uncertainties and challenges surrounding the future of international carbon credit markets make this option less viable.

- **Creating an enabling environment to attract international financial support and private sector support for climate investments.** Key priorities include strengthening governance (e.g., intensifying the fight against corruption), enhancing debt and PFM including fiscal transparency and accountability. Improving transparency and accountability in the use of climate resources would help attract climate finance by demonstrating effective use of resources. The process of mainstreaming climate issues in Liberia's financial system should be accelerated. In this regard, the authorities should consider developing financial sector policies and regulations that support adaptation and mitigation needs. These will help establish groundwork for financial sector participation in climate issues.
- **Strengthening disaster risk management and preparedness**. Robust disaster risk management and response strategies will increase the government's ability to respond quickly to climate-related disasters. Strict enforcement of laws or regulations that prohibit property construction in unsafe and hazardous zones like waterways, wetlands, and flood-prone areas is critical.[15] Equally important is investing in climate-related data, forecasting capabilities, and early-warning systems to support accurate risk assessments and inform adaptation strategies.
- **Enhancing climate resilience in key sectors like agriculture and water sectors and establishing targeted social protection systems to support the most vulnerable population.** Early actions should focus on promoting climate-smart agriculture, and adopting integrated water resource management practices to bolster climate resilience and minimize economic disruption. This is crucial considering most of Liberia's population depends on climate-sensitive agriculture (e.g., crop, fishery, and livestock) for subsistence. With agriculture being the backbone of the economy, addressing climate-related challenges through sustainable practices, including agroforestry, is crucial to enhance food security and build climate resilience.
- **Improving coordination among implementing agencies and fostering international collaboration**. Liberia should strengthen partnerships with international organizations and financial institutions to secure both funding and technical assistance for climate action initiatives. These collaborations are essential for Liberia to meet the preconditions for accessing climate finance.

[15] The recent demolition of illegal structures in wetlands, waterways, and beachfronts by EPA—working with the Presidential Executive Order 143 establishing a Taskforce Against Encroachment on Beachfronts, Waterways, and Wetlands—constitutes a step in the right direction.

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