United Nations Development Programme

Namibia

SDG PUSH FRAMEWORK

Unlocking New Pathways to SDG Acceleration

2024

Acknowledgements

The SDG Push Framework **is led by the government**, as part of their journey of developing roadmaps to achieve the SDGs in the country through a structured approach to identifying the accelerators.

This SDG Push publication is led by the SDG Integration Team of UNDP, the country office, and a team of national experts.

The national experts include a policy advisor, economist, data analyst, and engagement facilitator. We thank several UN agencies for their valuable comments on the design and implementation of SDG Push.

How to cite the Report:

UNDP (2024). Namibia SDG Push Framework: Unlocking New Pathways to SDG Acceleration. New York, NY: United Nations Development Programme.

With generous support from:

Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), on behalf of Federal Ministry for Economic Cooperation and Development (BMZ).

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Namibia SDG Push Framework
Unlocking New Pathways to SDG Acceleration

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This initiative is developed by the UNDP SDG Integration team, in cooperation with Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ), on behalf of Federal Ministry for Economic Cooperation and Development (BMZ).

Acronyms

BAU	Business-as-usual
BEGS	Balanced economic growth strategy
CCA	Common Country Analysis 2017
CGE	Computable General Equilibrium
GDP	Gross domestic product
GRN	Government of the Republic of Namibia
HDI	Human Development Index
HPP2	Harambee Prosperity Plan II
IMG	International Monetary Fund
INFF	Integrated National Financing Framework
MS	Micro-simulation
NDP 5	5th National Development Plan
NLFS	Namibia Labour Force Survey
NPC	National Planning Commission
SDG	Sustainable Development Goal
SIEG	Stimulating Inclusive Economic Growth
STIE	Skills transition through investments in education
TSPP	Targeted social protection program
UBIG	Universal Basic Income Grant
UNDP	United Nations Development Program
UNSDCF	United Nations Sustainable Development Cooperation Framework
VNR	Voluntary National Review 2021

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1. Executive Summary

The convergence of economic, environmental, and global health crises has jeopardized Namibia's upper-middle-income status and threatens to reverse the country's significant progress in overcoming poverty, inequality, and unemployment.

From 2016 to 2022, the Namibian economy experienced a near-zero economic growth rate, attributed to the decline in global demand for minerals and the prolonged drought (GRN, 2020). Further, the COVID-19 pandemic pushed the Namibian economy into a recession in 2020, when the economy contracted by 8 percent, the largest contraction in the last three decades. The prevailing situation has been further compounded by geopolitical events, including the ongoing conflict in Ukraine.

These crises have amplified Namibia's triple development challenges of poverty, inequality, and unemployment. Recent studies show that the convergence of these crises has reversed SDG progress in Namibia: the poverty headcount ratio increased from 17.4 percent in 2015 to 19.5 percent in 2020; the unemployment rate increased from 33.4 percent to 34.5 percent (UN, 2020); and, Namibia's Human Development Index (HDI) dropped from 0.615 to 0.402, with education, health and income contributing 25 percent, 19.9 percent and 53.6 percent, respectively, to this drop (UNDP, 2022).

Namibia is committed under the Harambee Prosperity Plan II (HPP 2), fifth National Development Plan (NDP 5), to the country's economic recovery plan post-COVID-19, and the United Nations Sustainable Development Goals (SDGs), to address its persistent development challenges. However, the current socioeconomic climate, combined with the shrinking fiscal space and external shocks, presents enormous challenges to achieving progress on each of the HPP 2 and NDP 5 goals, and the SDGs.

Evidence gathered from this report shows that Namibia will likely fall short from its committed developmental goals and targets if a 'business-as-usual' (BAU) approach persists. To this end, the Namibian Government needs to design policy actions that will achieve strong economic growth while reducing unemployment, inequality, and poverty. Identifying policy actions that have the potential for advancing progress requires an evidence-based approach.

One such approach is the SDG Push Framework. This Framework is a structured participatory approach for identifying plausible and country-specific economic policy actions or a roadmap with the aim to accelerate the achievement of key economic development targets and the SDGs.

The Framework builds on lessons learned throughout the COVID-19 pandemic and the first half of the 2030 Agenda for Sustainable Development by advancing longer-term structural transformation while balancing short-term imperatives. The SDG Push Framework comprises chronological and integrated phases: scoping, acceleration dialogues, modelling, sustainable finance, and acceleration pathways.

SDG Push in Namibia was led by the National Planning Commission (NPC) with technical support from the United Nations Development Programme (UNDP). During the scoping phase, considerable time was devoted to understanding the root causes of Namibia's critical development challenges and how they are linked to SDG progress. Additionally, the UNDP Data Futures Exchange and SDG Acceleration Diagnostic tools were used to generate insights on trends in SDG progress and gaps in Namibia. The main outcome of the scoping phase was the prioritization of the SDGs, with significant spillover effects on other SDGs that Namibia should pursue to advance SDG progress. To this end, SDGs 1, 8 and 10 which are closely linked to Namibia's persistent challenges of poverty, inequality, and unemployment, were prioritized.

Building on the outcomes of the scoping phase, acceleration dialogues interrogated the prioritized SDGs further to identify potential policy actions that could be pursued to advance progress. Through the acceleration dialogues, which were primary stakeholder consultations, several policy interventions were proposed. These policy proposals were synthesized using sensing-making protocols to identify SDG Accelerators, i.e. specific policy actions, that the Government could implement. These SDG Accelerators were either market-oriented or socially oriented, where the former works through the market system, while the latter works through the social systems, mainly government transfers to households.

From an economic modelling perspective, the SDG Push in Namibia was a combination of a market-oriented policy – i.e., stimulating inclusive economic growth – and a targeted social protection program. The market-oriented policy proposed increasing investments in inclusive growth sectors to achieve high economic growth and at the same time reduce unemployment. The targeted social protection program proposed making cash payments, equivalent to the average poverty gap, to poor households to reduce poverty and inequality and increase labor market participation among the poor.

Results from the modelling exercise highlighted the costs and benefits that Namibia could incur or receive under the SDG Push scenario. The indicative additional cost of the SDG Push was

estimated at US$ 2.23 billion in 2021 prices. In terms of benefits, Namibia, under the SDG Push scenario, can achieve higher economic growth, with average real GDP growth rates of at least 7% over the period 2021-2030; lower unemployment rate of up to 9.6% in 2030; lower national poverty headcount ratio of 5% in 2030; and lower inequality.

With regards to SDG progress, this report finds that under the BAU scenario, Namibia will not be on a trajectory to enable realization of the SDGs of interest by 2030.

Conversely, under the SDG Push scenario, the country can get back on track with its priority SDGs, directly associated with higher economic growth (SDG 8.1.1), reduced unemployment (SDG 8.5.1), reduced poverty (SDG 1.2.1), and reduced inequality (SDG 10.1.1).

Thus, the combined SDG Push scenarios would help the country achieve the prioritized SDGs and tackle the challenge of reducing unemployment, poverty, and inequality. The SDG stimulus will help the country to significantly reduce inequality while at the same time it will lower the country's liquidity constraints.

As this report presents a first analysis of the potential consequences of the SDG Push, several additional developments on this issue are envisaged. First, the scope of the economic modelling framework could be expanded to include more SDG indicators so that conclusions on progress can be made to a goal level, rather than at indicator level as done in this report. Second, climate change and economic governance were among the issues that were raised during stakeholder consultations. Given data and time limitations these issues, which are not considered in the current analysis, should be part of future SDG Push modelling in Namibia. Third, inequality persists under SDG Push, hence, future studies should explore policy interventions that can complement those proposed under SDG Push by addressing the inequality challenge.

2. Introduction

Namibia, like many other countries, has committed to work towards achieving the Sustainable Development Goals (SDGs) set by the United Nations. The SDGs aim to address a wide range of interconnected issues, including poverty eradication, quality education, gender equality and the empowerment of women, clean energy, climate action and sustainable cities, among others. The SDGs also aim to create a more equitable and sustainable world, where no one is left behind. They emphasize the importance of collaboration, partnerships, and innovative approaches to tackle complex global issues. They provide a framework for governments, international organizations, civil society, and the private sector to work together and act towards a more prosperous and inclusive future for all (UNDESA, 2022).

Although Namibia has made tremendous progress in advancing SDGs (NPC, 2021a), a confluence of economic and environmental crises threatens this progress (UN, 2020). From 2016 to 2022, the Namibian economy experienced a near-zero economic growth rate attributed to the decline in global demand for minerals and the prolonged drought (GRN, 2020; Harvard Growth Lab, 2020; World Bank, 2023a). The COVID-19 pandemic pushed the Namibian economy into a recession in 2020 that saw the economy contract by 8.5 percent. These crises, together with the ongoing geopolitical conflict in Ukraine, have amplified Namibia's persistent development challenges of poverty, inequality, and unemployment. In turn, this has impacted Namibia's SDG progress particularly on SDG targets related to economic growth, poverty, inequality, and unemployment (UN, 2020).

Responding to the likely reversals in development and SDG progress, the National Planning Commission (NPC),[1] with technical support from the United Nations Development Programme (UNDP), engaged in an SDG Push exercise. The SDG Push Framework provides a comprehensive and country-specific UNDP tool to plan and implement SDG breakthroughs in a variety of development contexts, for both pro-cyclical and anti-cyclical response moments – elevating fiscal, financial, digital, data and governance enablers of sustainable development. It builds on lessons learned through the COVID-19 pandemic and the first half of the 2030 Agenda by advancing longer-term structural transformation while balancing short-term imperatives.

1 The National Planning Commission (NPC) is a government institution with the mandate of planning, prioritizing and directing national development in Namibia.

The SDG Push Framework comprises the following key components:

- **Scoping**: examining specific contexts and trends with data visualization through the SDG Push Diagnostic, establishing a rapid landscape of trends, current priorities, futures, and interlinkages.
- **Acceleration Dialogues**: leveraging sensemaking protocols to explore scoping outcomes, interrogate previous policies, and chart accelerators.
- **Modelling**: engaging new forms of participatory and economic modelling to assess the impact of potential accelerators.
- **Sustainable Finance**: estimating financing and the feasibility of potential accelerators, using SDG finance tools, including the Integrated National Financing Framework (INFF).
- **Acceleration Pathways**: integrating insights developed through this approach with data visualizations and recommendations to advance policy interventions.

These components are essential in identifying development gaps, challenges, and drivers, developing potential interventions to address each challenge, and systematically assessing the costs, interlinkages and trade-offs related to the acceleration plan. The process aims to identify, evaluate, cost, and recommend country specific last-mile efforts to advance SDG progress. The steps work as an integrated iterative process, where progress in each component reinforces the other elements of the SDG Push.

The SDG Push Framework was piloted in five countries: Namibia, South Africa, Peru, Indonesia, and Moldova, with additional research conducted in Iraq. It was designed as an all-terrain tool, to catalyze breakthroughs from real-world constraints, rather than adding mechanical benchmarks or targets. The progressive roll out in pilot countries was led by Governments together with a team of experts, delivering a country-specific playbook that bridged short run and long run horizons. In this report we focus on Namibia.

In Namibia, the goal of the SDG Push was to identify economic policy roadmaps (hereafter referred to as 'SDG Accelerators') to accelerate the realization of key development targets that the Namibian Government has committed to under Vision 2030 (NPC, 2004) and the 2030 Agenda for Sustainable Development. The reversal in Namibia's SDG progress highlighted above, together with the dire socio-economic environment prevailing in Namibia reinforces the urgency to identify and implement economic policies that advance the SDGs and the country's development agenda.

This report is intended to provide an overview of the SDG Push Framework application in Namibia. It complements the suite of SDG Push tools and the diagnostic, together with technical annexes related to data analysis and policy modelling. The report is structured to provide an overview of framework design and implementation, summarizing the findings of each SDG Push scenario, and mechanisms for delivery within financial constraints.

3. SDG Push Pilot: Namibia

3.1 The Namibian Economy

For most of the decade prior to 2016–2020, the Namibian economy experienced a rapid and sustained economic growth regime. During the 2000–2015 period, the average annual real GDP growth rate was 4.8 percent. This economic growth regime was driven by an investment and export boom in the mining sector resulting from the global commodity super cycle (GRN, 2020). The increase in mining output and export led to an increase in government revenue, which in turn allowed the Government to pursue an expansionary fiscal policy. Starting in 2008, public expenditure surged; thereby, transmitting and amplifying the investment and export boom in the mining sector to the rest of the economy (Harvard Growth Lab, 2020).

However, by 2015, many of the factors behind the economic growth started to wane. The global commodity super cycle came to an end in 2014. For Namibia, the end of the commodity cycle was accompanied by a reduction in foreign direct investment in the mining sector. In fact, total investment in the Namibian economy plummeted, going from about 35 percent of the Gross Domestic Product (GDP) in 2014 to about 17 percent in 2021 (Namibia Statistics Agency, 2021). The decrease in investments combined with the fall in exports adversely affected government revenue. As a result, budget deficits increased to unsustainable levels which pushed the Government to pursue fiscal consolidation that reduced public expenditure, one of the key drivers of economic growth in Namibia. The COVID-19 pandemic pushed the Namibian economy into a recession in 2019 and 2020. Although the Namibian economy is showing signs of recovery, with growth estimated at 2.7 percent greater efforts are needed to grow the economy. Without dynamic policy interventions, Namibia is not on track to address development challenges or achieve its SDGs.

3.2 Scoping Phase

The scoping phase was the first step towards the development of Namibia's SDG Push Framework, providing a high-level overview of the Namibian landscape and current challenges, an overview of existing strategic policy and planning documents, and a country-specific SDG landscape. Insights on SDG context and trends were generated by using a sense-making protocol based largely on the SDG Push Diagnostics Tool, part of the UNDP Data Futures Platform (UNDP, 2023). Insights from the Diagnostic were supplemented with data and information on the SDGs from other sources including: the 2018 and 2021 Voluntary National Review (VNR) Reports for Namibia (NPC, 2018, 2021a); the Sustainable Development Goals; the Fifth National Development Plan Indicator Framework (NPC, 2021b); and the Sustainable Development Report 2023: SDG Index and Dashboards (Network, 2023), 2023 Sustainable Development Report (Sachs et al., 2023).

The sense-making protocol and machine learning techniques synthesized and identified priority SDGs using information contained in key national development documents such as GRN (2020), NPC (2017) and NPC (2004). SDGs 1, 3, 8, 10, 11 and 16 emerged as priorities for the SDG Push in Namibia (see Appendix I: Sense Making Protocol Outcomes).

Additional analysis was drawn from the Diagnostic Simulator platform by assessing documents including Namibia's Voluntary National Review (VNR) 2021, the Harambee Prosperity Plan II (HPP 2), the Common Country Analysis (CCA) 2017, the United Nations Sustainable Development Cooperation Framework (UNSDCF) 2019, the 5th National Development Plan (NDP 5), Vision 2030, and mapping the priorities of the Government to the SDGs using machine learning.

Since the SDGs are inherently interlinked, understanding the synergies and trade-offs among them was essential to identify interventions that could advance SDG progress. The SDG Push in Namibia used the SDG Linkages Tool, another component of the UNDP Data Futures Platform. The tool analyses target-level interlinkages to show how actions directed towards one SDG target influences the other SDGs targets.[2] Using the tool, the following SDG targets were identified as having more synergies and less trade-offs with other SDG targets:

[2] Details on the methodology underlying the SDG Linkages Tool are available on the UNDP Data Futures Exchange. https://sdgdiagnostics.data.undp.org/

- Target 1.2: By 2030, reduce at least by half the proportion of the population living in poverty in all its dimensions according to national definitions.
- Target 8.1: At least 7 percent gross domestic product growth per annum in the least developed countries through 2030.
- Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities.
- Target 10.1: By 2030, progressively achieve and sustain income growth of the bottom 40 percent of the population at a rate higher than the national average.

A key factor in the selection of these SDG targets was how closely they are related to the critical development challenges in Namibia – poverty (Target 1.2), economic growth (Target 8.1), unemployment (Target 8.5) and inequality (Target 10.1). The selected SDG targets were used to scope and guide the acceleration dialogues.

3.3 Acceleration Dialogues

The second phase of the SDG Push process was a series of systemic and multi-stakeholder dialogues. Analysis from the scoping phase was explored through acceleration dialogues to understand strengths (what was working), gaps (what needed attention), trends (emerging risks and opportunities), and interlinkages (interconnection of issues, solutions, and SDG indicators). The goal of the acceleration dialogues was to consult stakeholders and obtain their inputs on potential policy interventions that Namibia could pursue to advance SDG progress, particularly for targets related to economic growth, poverty, inequality, and unemployment. Considerable time and resources were invested in identifying potential SDG Accelerators.

Through the acceleration dialogues, several SDG Accelerators were proposed. These SDG Accelerators were primarily aimed at adopting policy measures to grow the economy and reduce poverty, inequality, and unemployment. These policy proposals were subjected to a sensing making process that clustered and synthesized into the following SDG Accelerators:

1. **Stimulating Inclusive Economic Growth (SIEG)**

The Stimulating Inclusive Economic Growth (SIEG) Accelerator sought to address the economic downturn experienced in Namibia, during the 2016–2020 period. Acceleration dialogue participants highlighted the need for *SIEG* through a reorientation of public investments towards inclusive and green growth sectors. Under the *SIEG* policy, public investments in inclusive growth were recommended to increase by 5 percent year-on-year until 2030; agriculture, manufacturing,

construction, wholesale and trade, and accommodation and restaurants are the key sectors to drive such growth.

2. Skills transition through investments in education (STIE)

The acceleration dialogues concluded that a shortage of skilled labor, i.e. a lack of workers with specialized knowledge, training, and expertise, is a binding constraint on economic growth in Namibia. This observation is consistent with Harvard Growth Lab (2020), which concluded that while the type of human capital that is acquired at school does not seem to be a binding constraint, the evidence suggests that the growth prospects of Namibia are constrained by a shortage of specialized skills and know-how. Furthermore, policies aimed at addressing the shortage in skilled labor are likely to unleash new opportunities in the formal labor market – more and quality jobs and better wages – for both skilled and non-skilled domestic workers and industries.

All the evidence suggested that Namibia is suffering from a skill shortage, which may be constraining the development of new engines of growth and limiting access to opportunity for Namibians across all skill levels. A s*kills transition through investments in education (STIE) Accelerator* was suggested to address Namibia's skill shortage. Under *STIE*, a 10 percent year-on-year increase in public investments in the education sector was proposed as a means of addressing such development challenge. These investments are aimed at accelerating the transition of the labor force from unskilled to skilled labor; addressing the skills mismatch between what the education system produces and what the industry needs; and promoting apprenticeship programs to foster the development of specialized skills and know-how.

3. Balanced economic growth strategy (BEGS)

Several initiatives for addressing the unemployment challenges were proposed during the acceleration dialogues. A synthesis of the proposed initiatives suggests that Namibia should pursue a *balanced economic growth strategy* (*BEGS)* to reduce unemployment. Under the *BEGS*, the goal was to reduce the unemployment rate to 5 percent by 2030. This is also the target for unemployment in Namibia's Vision 2030 (NPC, 2004). To reduce the unemployment rate to 5 percent by 2030, the *BEGS* requires an increase in the level of investments across all the sectors of the Namibia economy.

4. Universal Basic Income Grant (UBIG)

The main policy proposal in the *universal basic income grant (UBIG*) is a N$250 monthly cash payment by government to all Namibians between the ages 18-59 years old, who are not receiving the veteran grant nor are on the tax roll. Under the *UBIG*, old age pension, child grants, disability grants, and veteran grants will still be paid to eligible Namibians. Therefore, the *UBIG* policy only introduces the N$250 monthly cash payment to eligible Namibians. As such, the additional cost of the *UBIG* is estimated at N$2.22 billion, which translates to a 25.7% increase in the cost of social protection in Namibia. Background information about the *UBIG* policy is presented in Appendix II.

5. Targeted Social Protection Programme (TSPP)

Although Namibia has made significant progress in reducing poverty, the challenge persists. The country's poverty rate is relatively higher for an upper-middle-income country. During the acceleration dialogues, several initiatives were proposed to address poverty. These initiatives highlight the need for a *targeted social protection programme* (*TSPP)* that focuses on reducing poverty. A large segment of the Namibian population depends on transfers as the main source of income. Around 29 percent of the Namibian population resides in households whose main source of income is transfers, mainly government transfers in the form of old-age pension and child grants.[3] Given the persistent unemployment challenge, the only sure way to significantly reduce poverty in Namibia is through a *TSPP*.

Under the *TSPP*, households below the national poverty line, are identified and receive regular cash transfers from the Government that are equivalent to the poverty gap, i.e. the average income shortfall from the national poverty line of poor households. To ensure the effectiveness of the programme and mitigate the potential negative externalities of government cash transfers such as reducing the incentives for labor market participation, the *TSPP* will have conditionalities that must be satisfied by the beneficiaries. These could include participating in the public works programme, and entrepreneurship and vocational training. These examples are detailed in the technical component of the scoping and acceleration dialogues phases of the SDG Push in Namibia.

[3] Data from the 2015/2016 Namibia Household Income and Expenditure Survey (NHIES)

3.4 Modelling

The SDG Accelerators identified above were the basis for the modelling exercise, whose primary objective was to evaluate the potential impacts on SDG indicators related to the prioritized SDG targets. The economic modelling framework used was a carefully designed tool for the Namibian economy that combined a sequential dynamic Computable General Equilibrium (CGE) model with a Micro-Simulation (MS) model in both a top-down and bottom-up manner. The tool was used to perform ex-ante assessments of the likely impacts of SDG Accelerators on selected SDG indicators during the period from 2021 to 2030. Both the SDG Accelerators and SDG indicators were synthesized from the outcomes of the scoping exercises and acceleration dialogues (see Appendix III).

The CGE model was used to build a case for policy intervention and assist policymakers in understanding the extent to which some sectors of the economy might be affected by change. Its main advantage is its flexibility, which focuses on the structure and detail of agent-specific behavior and its ability to capture detailed economic relationships and connections that would otherwise be missed in other models. This complexity allows the models to be applied to a wide range of 'what if' questions. The model built a baseline scenario and projected its outcomes up to 2030.

Each SDG Accelerator outlined above was intended to advance progress with respect to the Namibia's critical development challenges (or priority SDG indicators) of slow economic growth (or SDG indicator 8.1.1), unemployment (or SDG indicator 8.5.2), poverty (or SDG indicator 1.21), and inequality (or SDG indicator 10.1.1). More specifically, SIEG, STIE, and BEGS policies aimed to address slow economic growth and unemployment, while UBIG and TSPP aimed to address poverty and inequality.

Given the complementarities among SIEG, STIE, and BEGS and between UBIG and TSPP, the SDG Accelerators were synthesized to create a single simulation scenario for the economic growth and unemployment objective, and another for the poverty and inequality objective. SIEG was considered as the appropriate SDG Accelerator to model the economic growth and unemployment objectives. TSPP was considered the appropriate SDG Accelerator to achieve the poverty and inequality objectives. As such, the SDG Push pursued the SIEG and TSPP scenarios alongside the business-as-usual (BAU) scenario.

1. The Business-as-Usual scenario

The first step in creating a reference point against which the SDG Push scenarios could be compared was to build a Baseline Scenario from BAU output information. This acted as a reference point or benchmark against which the proposed policy changes are compared. In other words, the BAU defines a development trajectory without the proposed SDG Accelerators. The BAU scenario, for the current analysis, assumed no SDG Accelerator would be implemented between the period 2024 to 2030; and Namibia's development trajectory would follow International Monetary Fund (IMF) projections of an average annual real GDP growth rates of 2.7% (IMF, 2023) for the period 2021 and 2028.

To implement this scenario, the macro model was simulated by exogenously adjusting the total factor productivity in value added production function for all the activities/industries to mimic the IMF's real GDP growth rate projections for Namibia.[4] Additionally, the labor growth rate of 2.4% (population growth rate) and capital depreciation rate of 3% were used in the implementation of the BAU scenario. In sum, the BAU assumes an average annual real GDP growth rate of 2.7% between the period 2021 and 2028.

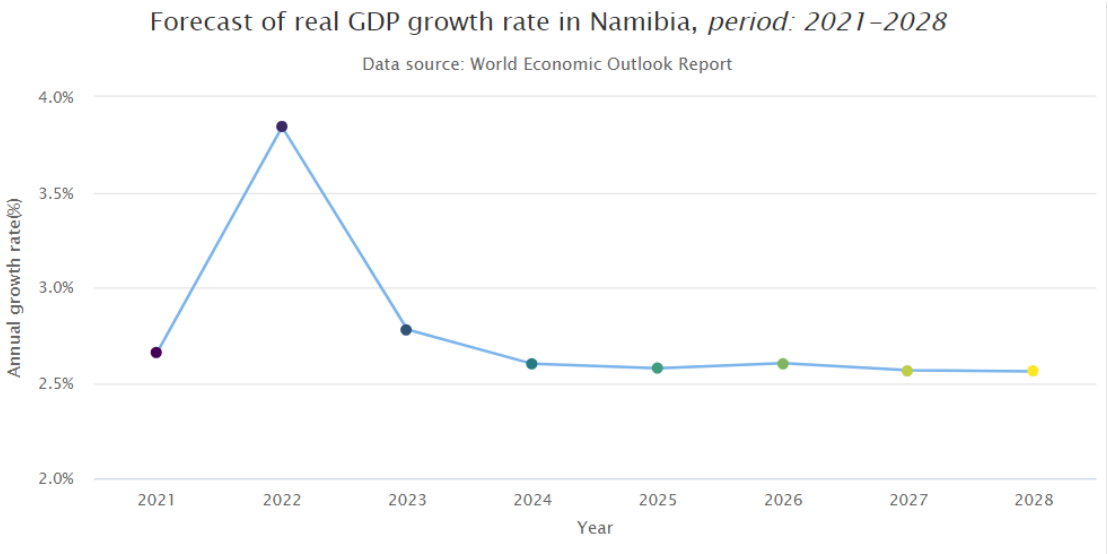

Figure 1: Forecast of real GDP growth rate in Namibia, period: 2021-2028.

2. The Stimulating Inclusive Economic Growth scenario

The main objective of the SIEG scenario was to simultaneously achieve an average real GDP growth rate of at least 7%, over the period 2024 to 2030, and reduce unemployment. As such,

[4] Government expenditure and public investments are expected to grow at 2.1% and 0.76%, respectively.

SIEG aims to advance progress on SDG indicators 8.1.1 and 8.5.2. The SIEG scenario was implemented by increasing the level of public investments in sectors with inclusive growth characteristics – i.e., those that contribute relatively more to value added and employment. The sectors that were identified to have inclusive growth characteristics were agriculture, manufacturing, construction, wholesale and trade, and accommodation and restaurants (i.e., a proxy for the tourism sector).

Technically, the SIEG scenario was implemented by incorporating the effects of public investments in CGE models that were proposed by Montaud et al. (2020). Under this framework, the total productivity parameter in the value-added production function (i.e., scale parameter) is modified and defined to be a function of public investments, sensitivity of sectoral production to public investments, and the sensitivity of sectoral output to investments in the construction and transport sectors (refer to Montaud et al. (2020) for further details). To run the scenario, the level of public investments in inclusive growth sectors was exogenously increased to achieve a real GDP growth rate of at least 7%.

3. The Targeted Social Protection Programme scenario

The main objective of the TSPP scenario was to significantly reduce poverty and inequality by increasing social grant transfers to poor households (i.e., below the national poverty line) equivalent to the poverty gap. The desired outcome for the TSPP scenario is to reduce the national poverty headcount ratio to 5% by 2030, and simultaneously reduce income inequality significantly. The TSPP scenario was implemented by increasing the social grant transfers to poor households by 126% on average (i.e., equivalent to the poverty gap). Additionally, a scenario called TSPP + Stimulus was implemented. This scenario assumes additional transfers to poor households of about 170%. When analyzing the spillover effects in the CGE model, 85% of transfers were assumed to be financed from external sources.

When implementing the TSPP scenario assumptions were made. First, the socio-demographic attributes of poor households – i.e., household size and share in the population – were assumed to not change significantly during the period 2021-2030. Second, access to the social grant is conditional on the participation of grant recipients in economic activities or labor market.

3.5 Results

The modelling results suggest that a combination of SIEG and TSPP policies offers the best opportunity for achieving the objectives of SDG Push in Namibia. A SIEG+TSPP policy would enable Namibia to achieve the economic growth, unemployment, and poverty objectives of SDG

Push. However, the simulation results also suggest that the SIEG+TSPP policy would not achieve significant reductions in inequality. Therefore, the SIEG+TSPP combination is the recommended policy package for SDG Push in Namibia.

Under the BAU scenario, Namibia makes slow progress on three out of ten SDG indicators, and no progress on seven out of ten SDG indicators (see the BAU column in Table 2 Appendix V). Therefore, if Namibia were to persist with BAU, the country will generally make slow to no progress on most SDGs. This means that Namibia needs to make additional efforts and commitments to addressing its development changes and advance SDG progress.

The SIEG scenario projects that Namibia could achieve economic growth (SDG 8.1.1) and unemployment (SDG 8.5.2) objectives of the SDG Push; and increases the level of agriculture productivity (SDG 2.3.1) and the overall productivity (SDG 8.2.1) in its economy. However, the country makes good progress on SDG 9.2.2 (i.e., creates additional employment in the manufacturing sector) and slow progress with respect to poverty reduction (SDG 1.2.1). Furthermore, the country makes no progress with respect to reducing income inequality (SDG 10.1.1); increasing the contribution of manufacturing to total value added (SDG 9.2.1); increasing the share of labor income in GDP (SDG 10.4.1); and increasing government revenue (SDG 17.1.1).

A SIEG+TSPP combination would assist Namibia to achieve the economic growth, unemployment, and poverty objectives of SDG Push, but slow progress in reducing income inequality. The value of combining SIEG and TSPP is that the former addresses the economic growth and unemployment issues, while the latter address the poverty issue and generates some progress on the inequality challenge. As such, the SIEG+TSPP combinations offer the best opportunity for putting Namibia on a development trajectory that advances SDG progress.

Impact on economic growth (SDG Indicator 8.1.1)

The economic growth achieved under each scenario are presented in Figure 2. The average annual real GDP growth rates that are achieved under the BAU, TSPP, and SIEG scenarios are 2.6%, 2.9%, and 7.6%, respectively. The growth rate achieved under SIEG is not surprising because the scenario was specifically designed to achieve growth rates of at least 7%. Insights from the CGE-MS model show that the SIEG scenario achieves the economic growth target of at least 7%, when the level of investment in inclusive growth sectors is increased by 10%.

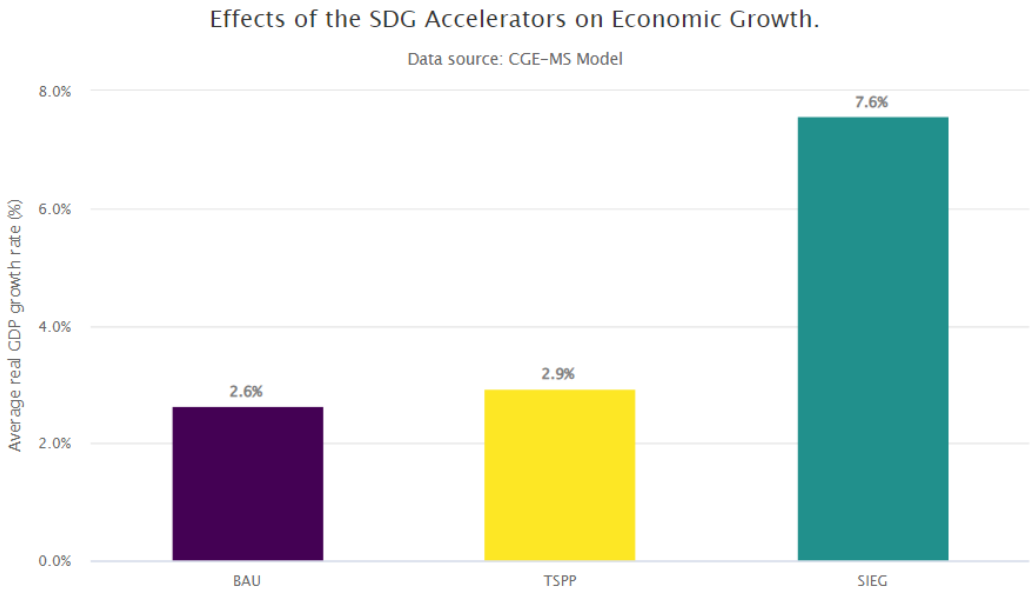

Figure 2: Impact of SDG Accelerators on economic growth.

Impact on the unemployment rate (SDG Indicator 8.5.2)

The unemployment rates achieved under each scenario by 2030 are presented in Figure 3. The largest decrease in unemployment is achieved under the SIEG scenario, where the unemployment rate decreases from 30.6% in 2021 to 10.1% in 2030. Under the BAU scenario, the unemployment rate decreases slight from 30.6% to 29.9% between 2021 and 2030, respectively. The unemployment rate increases slightly under the TSPP scenario from 30.6% to 31.8% between 2021 and 2030.

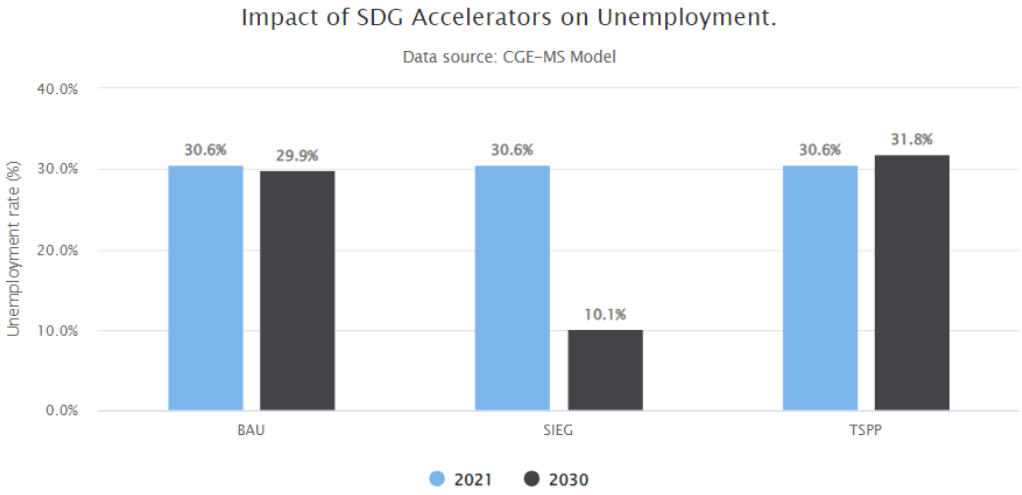

Figure 3: Average unemployment rate under each SDG Accelerators, between 2021 and 2030.

The observed reduction in the unemployment rate under the SIEG scenario is not surprising because the scenario achieves the largest increase in economic growth, which in turn increases the demand for labor in the economy. The TSPP scenario is designed to increase labor market participation among poor households. The observed increase in the unemployment rate under TSPP can be attributed to the scenario not generating sufficient demand in the economy to absorb extra labor coming from poor households. This situation leads to the observed increase in unemployment under the TSPP scenario.

In summary, the results suggests that SIEG is the appropriate policy to address unemployment. Additionally, the SIEG policy also achieves the economic growth objectives of SDG Push. The reduction in employment under the BAU is insignificant, which is consistent with the low economic growth rate that is achieved by the scenario. Therefore, the results suggest the unemployment objective of SDG Push in Namibia would not be achieved under the BAU policy regime. Finally, unemployment increases under the TSPP scenario. This means that the TSPP might not be appropriate for achieving the unemployment objective of SDG Push in Namibia.

Impact on poverty (SDG Indicator 1.2.1)

The CGE-MS model used the national poverty headcount ratio to capture the poverty effects under each scenario. The poverty effects results are presented in Figure 4. The results show that poverty reduces across all the scenarios, but the largest decrease is in poverty focused scenario, TSPP. Under this scenario, the national poverty headcount ratio decreases from 18.3% in 2021 to 5.0% in 2030, representing a reduction of 13.3 percentage point. Among the non-poverty focused scenarios, SIEG achieves a 3.1 percentage point decrease in poverty, while 1.8 percentage point decrease in poverty is achieved under BAU. Therefore, TSPP is the most appropriate policy for achieving the poverty reduction objective of SDG Push in Namibia.

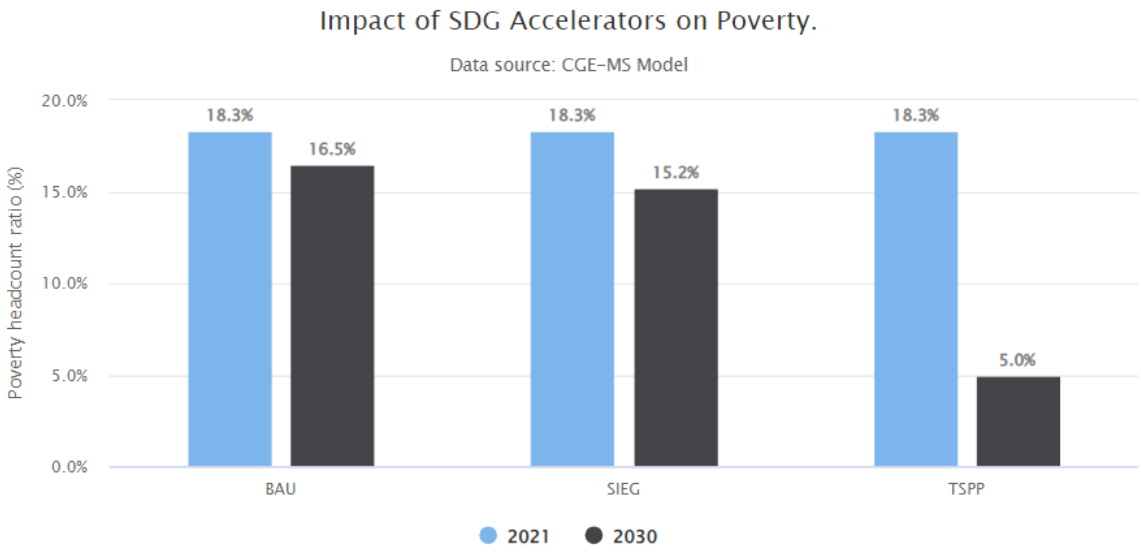

Figure 4: Impact of the SDG Accelerators on poverty.

Impact on inequality (SDG10.1.1)

The changes in the Gini coefficient (i.e., metric used to measure inequality) between 2021 and 2030 across all the scenarios is presented in Figure 5. The results suggest that income inequality increases under the BAU and SIEG scenarios; and slightly reduces under the TSPP scenario. Therefore, the results generally suggests that income inequality will persist under all the scenarios. To this end, the results suggests that inequality is the most challenging objective of SDG Push in Namibia. As such, it is imperative that the SDG Push efforts in Namibia should explore appropriate policy actions to address inequality.

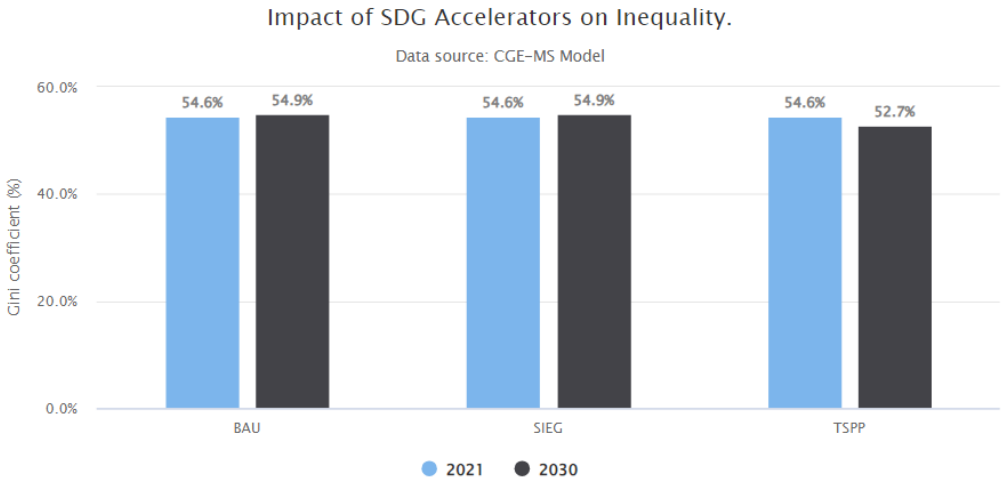

Figure 5: Impact of the SDG Accelerators on the Gini coefficient.

3.5 Sustainable finance

Additional financial resources are required to move from BAU to SIEG and then to SIEG+TSPP, and finally to SIEG+TSPP+Stimulus. The costs of these four policies (BAU, SIEG, SIEG+TSPP, and SIEG+TSPP+Stimulus) are observed in 2021 constant prices in both the CGE model and Micro-Simulation model. Therefore, the costs presented in this section should be treated as indicative for implementing the policies. The costs are presented as percentage of real GDP and in value terms (US$ at 2021 prices).

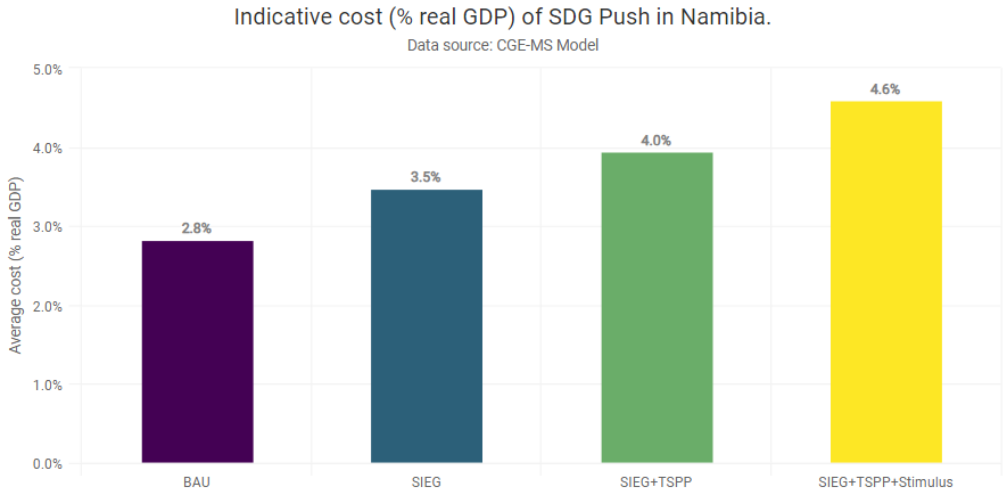

Figure 6: The total indicative cost (% of real GDP) in Namibia.

The total indicative costs (% of real GDP) of SDG Push in Namibia is presented in Figure 6. The values presented are computed by first expressing the cost of each scenario as a percentage of real GDP and then averaging the resulting percentage over the period 2021-2030. Therefore, the indicative costs in Figure 6 are averages for the period 2021-2030. The average indicative cost of the BAU scenario is estimated at 2.8% of real GDP. The average indicative costs of SIEG, SIEG+TSPP, and SIEG+TSPP+Stimulus are estimated at 3.5%, 4.0%, 4.6% of real GDP, respectively. This means that the average indicative cost of SDG Push in Namibia – i.e., the cost of the SIEG+TSPP+Stimulus scenario – is about 4.6% of real GDP.

In value terms – i.e., in USD terms – the indicative cost of the BAU, SIEG, and SIEG+TSPP are shown in Figure 7. The indicative cost for the BAU scenario is estimated at US$ 3.53 billion, in 2021 prices. The BAU cost increases by about US$ 814 million under SIEG and by US$ 1.41 billion under SIEG+TSPP, all in 2021 prices. SIEG+TSPP+Stimulus adds an additional US$2.2

billion.

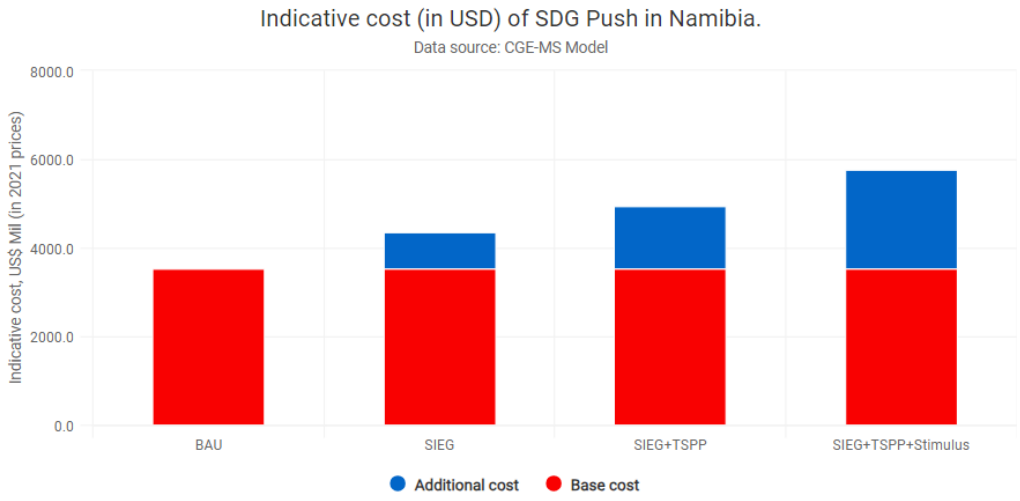

Figure 7: Indicative cost (in US$ in 2021 prices) of SDG Push in Namibia.

Potential effects of SDG Stimulus

The impact and progress analyses assume that SDG Push in Namibia will be financed from domestic savings/investments, mainly public savings. This assumption might not be consistent with the fiscal realities in Namibia on two fronts. Firstly, the fiscal space in Namibia has narrowed significantly over the last seven years. Namibia's public debt-to-GDP ratio surged from 26% in the first quarter of 2015 to 69% in the second quarter of 2022. This surge in public spending is attributed to reduced government revenue due to the economic downturn and COVID-19 pandemic. Therefore, Namibia might have limited fiscal space to finance the SDG Push.

Secondly, analysis of the relationship between real GDP growth and public-debt-to-GDP ratio shows that the current levels of public debt have surpassed the threshold point where increases in public debt cause crowding-out-effect threshold. Based on the analysis the threshold point is estimated at the public-debt-to-GDP ratio of 43.3%. Therefore, financing the SDG Push using public investments and government transfers will likely increase the public debt levels, creating crowding-out effects adversely affecting the desired outcomes, particularly the economic growth and unemployment objectives.

Given the fiscal realities, and in the absence of fiscal policy reforms such as increases in taxation to boost government revenue, Namibia needs to mobilize external funding, such as SDG

Stimulus, to finance its SDG Push efforts. External funding is essential to reduce the need for the government to borrow from domestic markets, thereby increasing the investment space for the private sector. The increase in the private sector investment space could be a key source of economic growth that would ultimately generate the desired impacts on SDGs.

To this end, the modelling exercise explored the potential impacts and progress that Namibia could achieve if 85% of the additional cost of the TSPP was financed using external sources such as SDG Stimulus. As such, an additional scenario, called TSPP+Stimulus, was defined and introduced in the CGE-MS model as a policy shock. The results showed that the SIEG scenario helps Namibia to achieve the economic growth and unemployment objectives, while the TSPP scenario helps Namibia to achieve the poverty objective. Therefore, the value-added of Stimulus is to significantly reduce the inequality while at the same time reduce the crowding out effects.

Perhaps the most significant insight from simulation results is that the stimulus will help the country to significantly reduce inequality (i.e., more than 10 percentage point change relative to BAU and 8 percentage point change relative TSPP), while at the same time Namibia will experience higher growth because the liquidity constraint will be lowered.

4. Conclusion

The modelling shows that with dynamic policy interventions explored through the SDG Push scenarios it is possible from economic and a fiscal perspective for Namibia to achieve its key SDG targets by 2030. From an economic modelling perspective, the SDG Push in Namibia was a combination of a market-oriented policy – i.e., stimulating inclusive economic growth – and a targeted social protection program. The market-oriented policy proposes increasing investments in inclusive growth sectors to achieve high economic growth and at the same time reduce unemployment. The targeted social protection program proposes making cash payments, equivalent to the average poverty gap, to poor households to reduce poverty and inequality and increase labor market participation among the poor.

Results from the modelling exercise highlights the costs and benefits that Namibia could incur or receive under the SDG Push scenario. The indicative additional cost of SDG Push is estimated at US$ 2.23 billion in 2021 prices. In terms of benefits, Namibia, under the SDG Push scenario (i.e., SIEG+TSPP+Stimulus), can achieve higher economic growth, with average real GDP growth rates of at least 7% over the period 2021-2030; lower unemployment rate of up to 9.6% in 2030;

and lower national poverty headcount ratio of 5% in 2030; and significant reduction in inequality (more than 10 percentage point change relative to the BAU).

With regards to SDG progress, this report finds that under the BAU scenario, Namibia will not be on a course to achieve key SDGs by 2030. Conversely, under the SDG Push scenario, Namibia regains its footing with priority SDGs directly associated with higher economic growth (SDG 8.1.1), reduced unemployment (SDG 8.5.1), poverty (SDG 1.2.1), and inequality (SDG 10.1.1). Thus, the SDG push scenarios would help the country achieve the prioritized SDGs and tackle the challenge of reducing unemployment, poverty, and inequality.

As this report presents a first analysis of the potential consequences of the SDG Push, several additional developments on this issue are envisaged. First, the scope of the economic modelling framework could be expanded to include more SDG indicators so that conclusions on progress can be made to a goal level, rather than at indicator level as done in this report. Second, climate change and economic governance were among the issues that were raised during stakeholder consultations. Given data and time limitations these issues, which are not considered in the current analysis, should be part of future SDG Push modelling in Namibia. Third, inequality persists under SDG Push, hence, future studies should explore policy interventions that can complement those proposed under SDG Push by addressing the inequality challenge.

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Technical Appendices

Appendix I: Sense Making Protocol and Diagnostic Simulator Outcomes

The outcomes of the sense-making protocol are summarized in Figure 8, where the size of the bubble indicates the relative importance of the SDG. Accordingly, SDGs 1, 3, 8, 10, 11 and 16, with relatively larger bubble sizes, emerged as priorities for the SDG Push in Namibia.

Figure 8: The SDGs that emerged as priorities in the scoping phase.

Additional analysis was drawn from the Diagnostic Simulator platform by assessing documents such as Namibia's Voluntary National Review (VNR) 2021, the Harambee Prosperity Plan II (HPP 2), the Common Country Analysis (CCA) 2017, the United Nations Sustainable Development Cooperation Framework (UNSDCF) 2019, the 5th National Development Plan (NDP 5), Vision 2030, and the mapping priorities of the Government to the SDGs using machine learning. The tool reveals the most prominent SDGs referenced in the national policy documents.

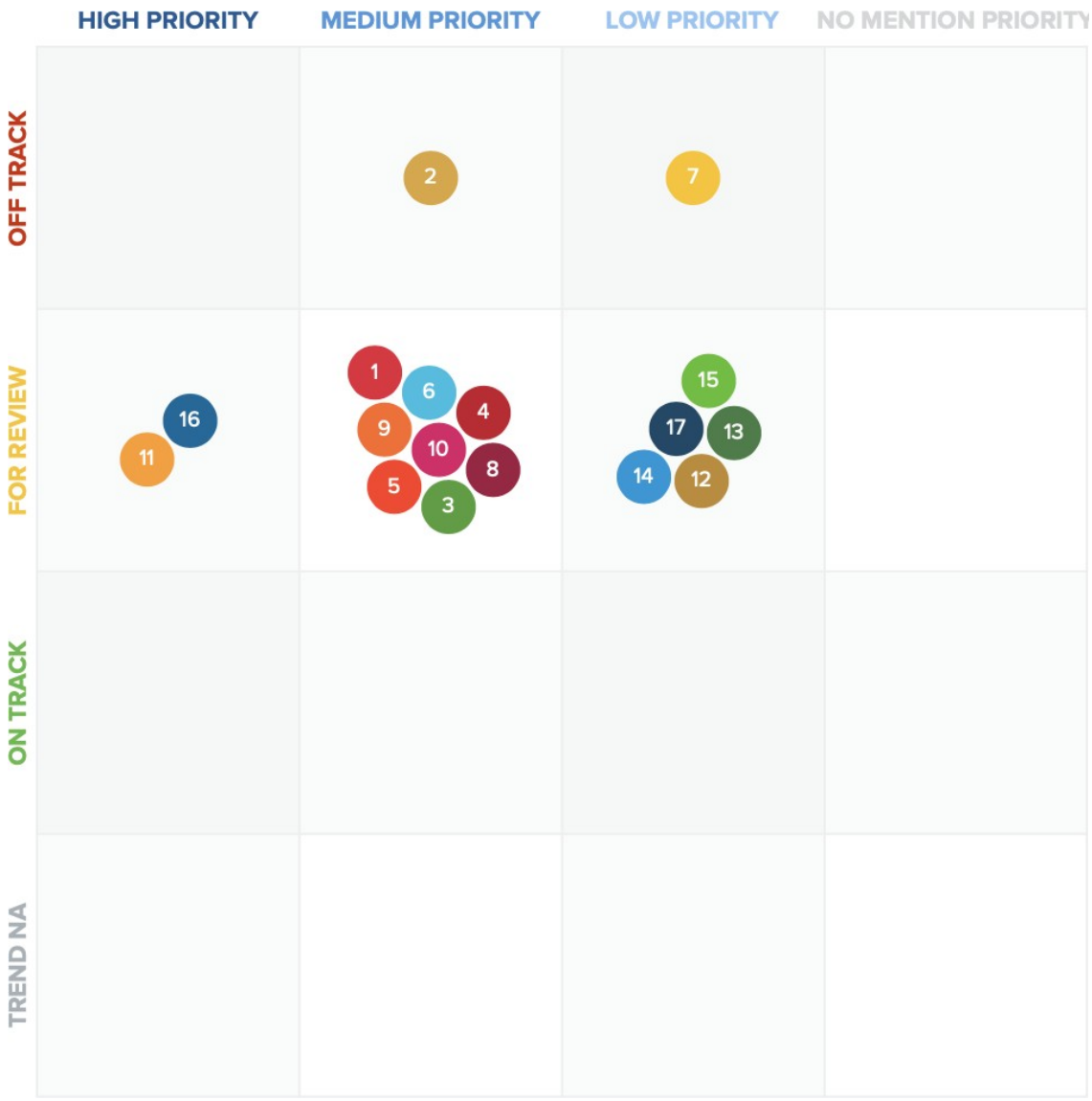

Figure 9: Matrix comparing SDG national priorities.

Source: Based on Namibia's latest VNR, Vision 2030, NDP 5, HPP 2, CCA 2017, UNSDCF 2019 and SDG gaps according to the Diagnostic Simulator Platform.

The matrix above (Figure 9) maps the SDGs along two parameters: their current trend status and their prominence referenced in various long-term strategic development documents. SDGs 11 and 16 are identified as high priority, hence would need to be given due attention through policy intervention to accelerate their achievement by 2030. Additionally, SDGs 1, 3, 4, 5, 6, 8, 9 and 10 are medium priority based on machine learning and are also classified as the SDGs that may not be achieved by 2030 if concerted policy interventions are not carried out to focus on their achievement.

Based on the results presented through the machine learning, SDGs 12, 13, 14, 15 and 17 were found to be low priority in the key policy and planning documents analyzed. SDG 2 was found to be a medium priority based on the analyses but is currently off-track, which indicates that with the current trend, the country is likely to fail to achieve it by 2030.[5] Although SDG 7 is critical for the development and transformation of Namibia, it was found to be a low priority from the documents assessed and analyzed through the machine learning and currently off-track on its in-country target. To ensure that the country gets back on track to achieve SDGs 2 and 7, it will require investments in a mix of policy interventions in sustainable food security and food systems, and just energy transition for all, respectively.

Since the SDGs are inherently interlinked, understanding the synergies and trade-offs among them is essential in identifying interventions that could advance SDG progress. To this end, the SDG Push in Namibia used the SDG Interlinkages Tool that is part of the UNDP Data Futures Platform. The Tool analyses target-level interlinkages to show how actions directed towards one SDG target influences the other SDGs targets.[6] Using the Tool, the following SDG targets were identified from the priority SDGs to have more synergies and less trade-offs with other SDG targets:

- Target 1.2: By 2030, reduce at least by half the proportion of population living in poverty in all its dimensions according to national definitions.
- Target 8.1: At least 7 percent gross domestic product growth per annum in the least developed countries through 2030.
- Target 8.5: By 2030, achieve full and productive employment and decent work for all women and men, including for young people and persons with disabilities.
- Target 10.1: By 2030, progressively achieve and sustain income growth of the bottom 40 percent of the population at a rate higher than the national average.

A key factor in the selection of these SDG targets was how closely they are related to the critical development challenges in Namibia – poverty (Target 1.2), economic growth (Target 8.1), unemployment (Target 8.5) and inequality (Target 10.1). The selected SDG targets were used to scope and guide the *acceleration dialogues.*

[5] UNDP, 2022. "SDG Diagnostic Simulator". https://data.undp.org/sdg-push- diagnostic/NAM/sdg-trends
[6] Details on the methodology underlying the SDG Linkages Tool are available on the UNDP Data Futures Exchange. https://sdgdiagnostics.data.undp.org/

Appendix II: Selected SDG indicators

The SDG indicators that were used to evaluate the proposed SDG Accelerators are presented in **Table 1**. The selection and inclusion of an indicator was based on two criteria. First, the indicator must be linked to the prioritized SDGs and SDG targets (i.e., SDGs 1, 8, and 10 and SDG targets 1.2, 8.1, 8.5, and 10.1). To this end, four (4) SDG indicators were identified and selected - i.e., 1.2.1, 8.1.1, 8.5.2, and 10.1.1 (see **Table 1**). The indicators were classified as priority indicators and were used as the main yardsticks for assessing the SDG Accelerators. Second, the selection and inclusion of an SDG indicator can be assessed or measured accurately using the modelling framework. To this end, six (6) SDG indicators, classified as indirect SDG indicators, were identified (see **Table 1).** Therefore, a total of 10 indicators were selected and formed part of the result framework for the economic modelling phase.

The 2021 baseline values and progress of the selected SDG indicators are also shown in **Table 1**. The values and progress on the SDG indicators are primarily extracted from the UNDP Data Futures Platform. However, the baseline values (i.e., 2021 values) for the SDG indicator 1.2.1 (i.e., national poverty headcount ratio) was estimated using the national data and statistics. The estimation was necessary as the most recent value of the SDG indicator 1.2.1 is the 2015 value. The estimation was based on a reweighting technique, where sample weights in the latest nationally representative household dataset (i.e., the 2015/2016 Namibia Household Income and Expenditure (NHIES)) were updated using observed changes in household consumption expenditure. The updated weights were then used to compute the national poverty headcount ratio.

It is clear from Table 1 that progress assessment at the baseline was constrained by data gaps – i.e., progress on most indicators was classified as Trend NA, meaning information to establish the trend is not available. However, two SDG indicators were on track (i.e., SDG 10.4.1 and SDG 17.1.1); while two others (i.e., SDG 9.2.1 and SDG 9.2.2) had limited progress at baseline. Both the baseline values and progress assessment, presented in **Table 1**, are used as reference in the assessment of impact and progress of the SDG Accelerators on the selected SDG indicators.

Table 1: Selected SDG indicators used to evaluate the SDG Accelerators

INDICATOR	METRIC[1]	BASELINE[2]	PROGRESS[3]	TARGETS[4]
PRIORITIZED				
SDG 1.2.1	National poverty headcount ratio (i.e., proportion of the population below the national poverty line).	18.3%	Trend NA	9.2%
SDG 8.1.1	Real GDP growth rate	3.5%	Trend NA	7.0%
SDG 8.5.2	Unemployment rate	33.4%	Trend NA	<
SDG 10.1.1	Gini coefficient	54.6%	Trend NA	<
INDIRECTLY				
SDG 2.3.1	Agriculture labor productivity	6.6%	Trend NA	>
SDG 8.2.1	Real GDP per employee growth rate.	−5.7%	Trend NA	>
SDG 9.2.1	Manufacturing value added share in GDP.	11.2%	Limited	>
SDG 9.2.2	Manufacturing share in total employment	6.2%	Limited	>
SDG 10.4.1	Labor share in GDP	43.8%	On track	>
SDG 17.1.1	Government revenue as proportion of GDP	34.9%	On track	>

[1]Metric used to measure the SDG indicator in the CGE and MS models.

[2] Baseline values (2021) for the SDG indicators estimated using the data from the CGE and MS models.

[3] Progress assessment is based on the UNDP Data Futures Platform. Note that Trend NA (grey) implies no data available, Limited (orange) means limited progress, and on track (green) means the indicator is on track.

[4] The target for SDG 1.2.1 is estimated as 50% of the estimated national poverty headcount ratio. The target for SDG 8.1.1 comes from the overall SDG Result Framework. For indicators that do not have targets the sign '>' means increase in the indicator is desired over time, while '<' means decrease in the indicator is desired over time.

Appendix III: Methodology and Data

The impact of the SDG Accelerators on the selected SDG indicators was estimated using a recursive dynamic Computable General Equilibrium (CGE) model (i.e., macro-model) linked to a static Micro-Simulation (MS) model (micro-model). The conceptual framework of the economic modelling framework is illustrated in Figure 10. First, the CGE and MS models are linked in a sequential manner, i.e. top-bottom and bottom-top. Hence, outputs from the CGE model (or MS model) are passed to the MS model (CGE model) as input or shock when the sequential linkage is top-bottom (bottom-top). This sequential linkage approach allows for the analysis of SDG Accelerators that are implemented at macro level (i.e. BAU and SIEG) and micro level (i.e. TSPP). The variables that were used to link the CGE and MS models were employment and household consumption expenditure.

The SDG indicators 1.2.1 and 10.1.1 were estimated using the MS model, while the rest of the indicators were estimated using CGE Model. Impact was measured in terms of percentage change from the baseline value. For SDG indicators estimated using the CGE model, annual average values over the simulation period (i.e., 2021-2030) were computed and baseline values were subtracted from them to estimate impact. On the other hand, impact on SDG indicators estimated from the MS model was computed by subtracting the 2030 values from the baseline values.

Second, results from the CGE and MS models are passed to the SDG Result Framework to assess progress on the selected SDG indicators. The SDG Result Framework for SDG Push in Namibia identified six (6) SDGs (1, 2, 8, 9, 10, and 17) and ten (10) corresponding SDG indicators (see **Table 1)**. Progress is assessed by classifying the results from the CGE-MS model based for each SDG indicator as *achieved, good progress, slow progress, or no progress* using a simple classification system.

The third key element is that SDG progress is the ultimate output from the economic modelling framework. Progress on SDG indicators is communicated as on track (green), fair (yellow), limited (orange) and deteriorating (red).

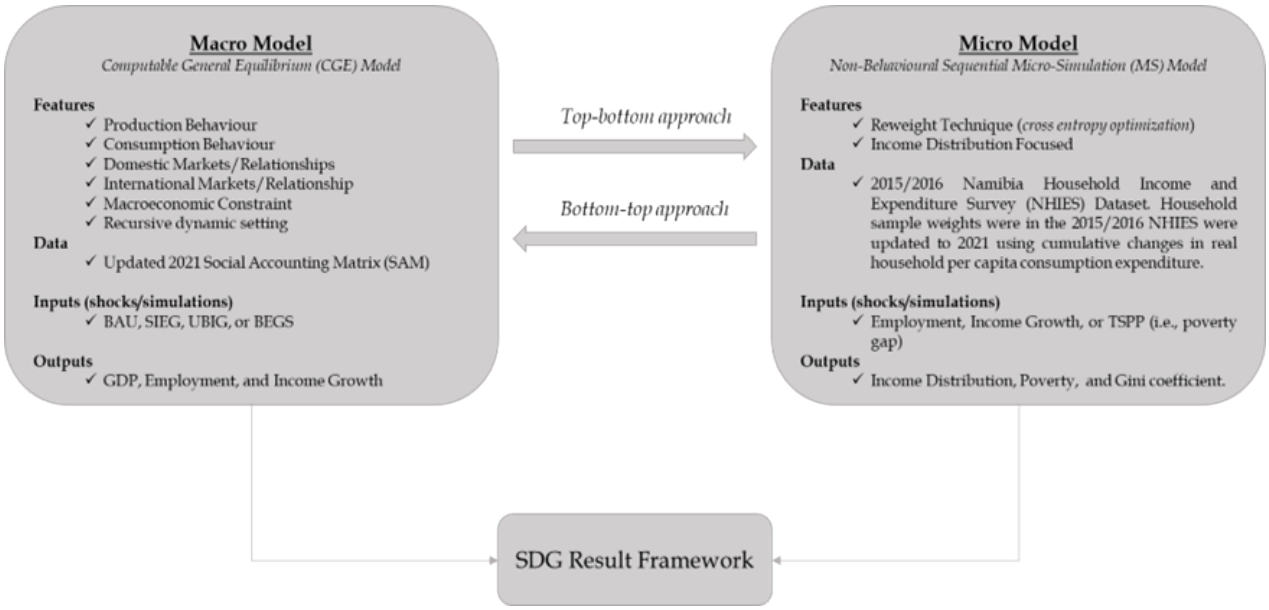

Figure 10: Illustration of the Macro-Micro Modelling Framework

The rest of this annex presents cursory overviews of the CGE and MS models, whose design and structure are largely based on Decaluwé et al. (2013) (for the CGE model) and Cockburn, Savard & Tiberti (2014) and Bourguignon & Spadaro (2006) (for the MS model). The annex highlights the standard features, data inputs and extensions. The reader may refer to Decaluwé et al. (2013), Cockburn et al. (2014) and Bourguignon & Spadaro (2006) for more details on the specifications, structure, and assumptions and implementation of the CGE and MS models, respectively.

The CGE model

To evaluate the impact of the SDG Accelerators on the Namibian economy and subsequently measure the resultant SDG progress, a dynamic Poverty and Economic Policy (PEP 1-t) standard model proposed by Decaluwé et al. (2013) is used. The standard PEP 1-t model was customized by changing several assumptions, i.e. 'free parameters', to better reflect the Namibian economy. The model has two production factors, which are capital and labor; the latter is disaggregated into four categories: workers with no formal education, and workers with primary education, secondary education, and tertiary education.

The model has a detailed production block consisting of 23 industries. Each industry's production technology is assumed to be of constant return to scale and is presented in a three-level nested production process. At the first level, each industry output is a Leontief aggregation of value added and intermediate commodities. At the second level, a constant elasticity of substitution (CES) function is used to represent the substitution between composite labor and capital in the production of value added. At the third level, composite labor demand is also a CES aggregation of the four labor categories.

To capture the idiosyncrasies in income and expenditure patterns among households, the model has nine Representative Household Groups (RHGs), which are formed based on the household head's main source of income and education attainment. Households receive income from the factors of production (directly or indirectly via the firms) and transfers from other institutions (i.e. other households, firms, government, and the rest of the world). Households use their income to pay direct taxes, save, consume and make transfers to other institutions. The consumption of RHGs covers marketed commodities, purchased at market prices that include commodity taxes and transaction costs, and self-produced commodities which are valued at their opportunity cost, i.e. market prices. It is assumed that the consumption decisions are based on an extended linear expenditure system (ELES) demand function, which is derived from maximizing the Stone-Geary utility function with an endogenous saving behavior.

In the model, the Government collects taxes and receives transfers from other institutions. All taxes are at fixed ad valorem rates. The Government uses this income to purchase commodities for its consumption and for transfers to other institutions. Government consumption and transfer expenditures are fixed and indexed to the average change in consumer prices (i.e. Consumer Price Index, or CPI). Government savings, i.e. the difference between government income and spending, is a flexible residual.

The model allocates domestic output between exports and domestic markets on the assumption that suppliers maximize sale revenues for any given output level, subject to imperfect transformability between exports and domestic sales, expressed by a Constant Elasticity of Transformation (CET) function. In the international markets, export demands are infinitely elastic at given world prices. The price received by domestic suppliers for exports is expressed in domestic currency and adjusted for the transaction costs (to the border) and export taxes (if any). The supply price for domestic sales is equal to the price paid by domestic consumers minus the transaction costs of domestic marketing (from the supplier to the consumers) per unit

of domestic sales. If the commodity is not exported, total output is passed to the domestic market.

Domestic demand is made up of the sum of demands for household final consumption, government final consumption, investment, and intermediate consumption including trade and transportation services (transactions cost). To the extent that a commodity is imported, all domestic market demands for a composite commodity are made up of imports and domestic output, the demands for which are derived on the assumption that domestic consumers minimize cost subject to imperfect substitutability. This is captured by a CES aggregation function. The derived demands for imported commodities are met by international supplies that are infinitely elastic at given world prices.

The import prices paid by domestic consumers include import tariffs at fixed ad valorem rates and the cost of a fixed quantity of transactions services per import unit, covering the cost of moving the commodity from the border to the consumer. Similarly, the derived demand for domestic output is met by domestic suppliers. The prices paid by the consumers include the cost of transactions services, which shows here that the commodity was moved from the domestic supplier to the domestic consumer. The prices received by domestic suppliers are net of these transaction costs. Total market demand is directed to imports for commodities that lack domestic production and to domestic output for non-imported commodities.

The model includes a set of constraints that must be satisfied by the system. These constraints cover goods and factor markets and macroeconomic aggregates (e.g. balances for Government, the current account of the rest of the world, and savings and investments). Flexible relative prices equilibrate the demand and supply of domestically marketed output. Several segments of the labor market are defined and assumed to be running in an imperfect competition setting. Government savings (i.e. the difference between current government revenues and current government expenditures) is a flexible residual while all tax rates are fixed. The real exchange rate is flexible, while foreign savings (i.e. the current account deficit or the difference between foreign currency spending and receipts) are fixed. Investment is savings-driven in that it is determined by the sum of private (households and firms), public (government) and foreign (rest of the world) savings.

The model is recursive dynamic involving ten periods. The dynamic setting of the model is largely based on Jung & Thorbecke (2003). In the dynamic setting, it is assumed that

consumers and producers make one-period utility-maximization and profit-maximization decisions, respectively. The consequences of consumer and producer decisions in one period are translated into the next period mainly through savings and capital accumulation. The model uses a standard capital accumulation formula; thus, savings increase the existing capital stock net of depreciation. The allocation of new investment by sector is influenced by the cost and return on capital specific to the sector. Production factors (i.e. capital and labor), private final consumption and public final consumption are set to grow from one period to another at an exogenous fix rate. To appropriately simulate the customized PEP 1-t model, based on the assumptions in the SDG Accelerators, three extensions were made to the model. These extensions were designed to capture the chronic unemployment challenge in the labor market; effects of education investments on skills transition in the labor market; and externality effects of public investments on industry output.

These extensions are briefly elaborated on below:

Unemployment

The standard recursive dynamic CGE model assumes full employment - i.e., labor supply fixed. This assumption is at odds with the observed unemployment in Namibia. To account for unemployment, the standard recursive dynamic CGE model was extended by introducing a wage curve as proposed by Blanchflower & Oswald (1995). The wage curve captures the relationship between unemployment and wages at the industry level. The wage curve is expressed as follows:

$$u_{ij} = w_{ij}^{\eta}$$

Where u_{ij} is the unemployment rate for labour category i in industry j; w_{ij} is the real wage rate for labour category i in industry j; and η is the elasticity of the wage rate with respect to the changes in the unemployment rate. Using econometric techniques, Blanchflower & Oswald (1995) estimated a wage rate elasticity of -0.1 - i.e., $\eta = -0.1$ across several countries. As such, when implementing the wage curve in the CGE model, η was also assumed to be equal to -0.1. This means that the CGE model assumes that a 1% decrease in wages is associated with a 10% increase in the unemployment rate.

When introducing the wage curve into the CGE model, the total stock of labor force for each industry j is fixed at $\widehat{L_j}$. Therefore, the stock of labour that is employed in each industry - i.e., L_j^s - , is estimated as:

$$L_j^s = (1 - u_j)\widehat{L_J}$$

Under the perfectly immobile labor assumption, the labor force for each industry is calculated to match sectoral unemployment rates. Each industry represents a different market and thus has a different unemployment rate. For the perfectly mobile labor assumption, unemployment rates across sectors are identical ($u_j = u$), so each sector's labor supply is a function of that sector's total labor stock and the economy-wide unemployment rate:

$$L_j^s = (1 - u)\widehat{L_J}$$

Externality effects of public investments

Except for the Targeted Social Protection Program (TSPP) and Universal Basic Income Grant (UBIG), all the other SDG Accelerators require increasing public investments to stimulate output growth. To properly capture the effects of public investments we distinguish public investment in infrastructure (transportation, energy, communication) from public investment in other sectors (like agriculture, manufacture). This is because public investments in infrastructure have potential externality effects on sectoral or industry output (Cetin, 2022; Montaud, Dávalos, & Pécastaing, 2020; and Boccanfuso, Joanis, Richard, & Savard, 2014). Therefore, the CGE model based on Decaluwé et al. (2013) was extended using by introducing an externality parameter ($\theta_{j,t}^{pub}$) in the production functions to capture the impact of public investment in infrastructure[7] on industry value added - thus:

$$VA_{jt} = \theta_{j,t}^{pub} F(LDC, KD)$$

Where VA_{jt} is the value-added of industry j in time t and $F(\cdot)$ is the CES function of composite labor (LDC) and capital (KD). The externality of public investments is estimated as follows:

$$\theta_{j,t}^{pub} = \left(\frac{KD_{gov,t}}{KD_{gov,t-1}}\right)^{\xi_{gov,j}}$$

Where $\xi_{gov,j}$ represents the elasticity of the externality of public investment on value-added of industry j. The values of the $\xi_{gov,j}$ parameter was obtained from Montaud et al. (2020).

[7] In our model, public investments in other sectors like agriculture or manufacturing only affect the productivity of those sectors; i.e., no externality effect.

Micro-simulation model

The Microsimulation (MS) model is used to predict changes in poverty and inequality (i.e., at the micro or household level) that is associated with changes in household income that are observed in the CGE model after a policy shock. There are multiple approaches to conducting top-down and/or bottom-up macro-micro analyses. The choice among these approaches depends on data availability, the research question and time constraints (Cockburn et al., 2012). The MS model that was used is largely based on a reweighting pioneered by Meagher (1993), and later applied and modified by Ferreira and Horridge (2006), Bourguignon and Spadaro (2006), Buddelmeyer et al. (2008), and Fofana et al. (2023).

At a fundamental level, the MS model alters sample weights assigned to a household in survey using auxiliary information on household income that is passed from the CGE model. In other words, the MS model seeks to find new sample weights that are consistent with the auxiliary information on household income coming from the CGE model. Technically, the MS model minimizes the distance between new and old sample weights subject to a set of constraints – i.e., observed changes in household income that are observed in the CGE model after a policy shock.

Illustration of reweighting techniques used in Micro-simulation (MS)

The MS model is essentially an optimization framework that minimizes the distance between new and old sample weights subject to a set of constraints. The MS model is implemented using the Kullback–Leibler minimum divergence cross-entropy (CE) principle. The MS model was implemented in two steps. First, initial sample weights assigned to each household in the updated 2015/2016 Namibia Household Income and Expenditure Survey (NHIES) were transformed into a prior probability distribution. Second, the Kullback–Leibler minimum divergence cross-entropy (CE) was used to cover a posteriori probability distribution consistent with household income, stratified by source (i.e., labor, capital, and transfers), that is observed in the CGE model after a shock.

Mathematically, the MS model can be defined as an optimization problem with the objective function shown below. The MS model minimizes the distance (D) between the initial distribution of sample weights (or the prior distribution q) and the ideal or new distribution of sample weights (or the posterior distribution p).

$$D = \sum_i p_i \cdot log\left(\frac{p_i}{q_i}\right)$$

The objective function above is subject to two constraints or restrictions. First, D is minimized to achieve consistence between aggregate household income by source, Y_j, observed in the CGE model after a shock and aggregate household income by source, $\sum_i y_{j,i}\, p_i$ observed in the survey – i.e., NHIES. Note that $y_{j,i}$ is the income of household i in the survey from source j. Therefore, $i = 1, \dots, m$, where m is the number of households in the survey (i.e., NHIES); and $j = 1, \dots, s$, where s denotes the number of household income sources. This first constraint can be expressed as follows:

$$Y_j = \sum_i y_{j,i}\, p_i$$

Second, D is minimized to subject to the posterior distribution p being a probability distribution – i.e., the area under the posterior distribution p must be equal to 1. Thus:

$$\sum_i p_i = 1$$

The objective function and constraints above are the core components of the MS model that was used to predict changes in poverty and inequality consistent with changes in household income by source observed in the CGE model after a policy shock – i.e., BAU, SIEG, and TSPP.

In the MS model household income is measured by the per capita household consumption expenditure. Income inequality across the population is measured by the Gini coefficient, which is derived from the Lorenz curve, and ranges from 0 (perfect equality) to 1 (perfect inequality). The Lorenz curve depicts the cumulative proportion of income earned by the cumulative proportion of the population when the latter is sorted from the poorest to the richest. The poverty assessment uses the Foster-Greer-Thorbecke (FGT) family of poverty measures and, more precisely, the poverty headcount ratio, i.e., the proportion of the population with incomes lower than the national poverty line – i.e., N$6,249 per adult equivalent per year (i.e., equivalent to e $1.90 a day at 2011 PPP or international poverty line).

Data

The CGE model was calibrated on an updated 2021 SAM for the Namibian economy. The 2021 SAM for Namibia was compiled using various data sources, including the 2021 National Accounts (Namibia Statistics Agency, 2021), the 2018 Namibia Labor Force Survey (Namibia Statistics Agency, 2018) and the 2015/2016 National Household Income and Expenditure Survey (Namibia Statistics Agency, 2017b). The compiled 2019 SAM for Namibia is a comprehensive, flexible and disaggregated framework that elaborates on the generation of income by activities of production and the distribution and redistribution of income between social and institutional groups. The 2019 SAM includes the following groups of accounts: 21 activities (industries); 21 commodities (output markets); 5 factors; 1 firm; 5 governments; 9 households; 2 savings and investments; and 1 rest of the world.

The MS model was calibrated on the 2015/2016 NHIES dataset, which was compiled by the Namibian Statistics Agency. The 2015–2016 NHIES was used because it was the most recent nationally representative dataset containing key data that were used to estimate the SDG indicators at the household level. Given that the 2015–2016 NHIES was old, the initial household sample weights could not be used directly in the MS Model with adjustment. Therefore, the initial household sample weights were updated, using the reweighting technique explained, where the auxiliary data were the cumulative change in real household consumption expenditure in the 2016–2021 period. It is these adjusted sample weights that were used as initial weights, in subsequent analyses, in the MS model.

Baseline year

The baseline year in economic modelling is the year that is used to represent the current state of the economy. It is used to calibrate the economic model, i.e. the model is adjusted so that it produces results that are consistent with the data for the baseline year. The baseline year is important because it provides a starting point for the model. The model is then used to project how the economy will change over time, given a set of assumptions about future policies and shocks.

Choosing a baseline year is a crucial starting point in any modelling exercise because it can affect the results of the model. For example, if the baseline year is a year of economic recession, then the model may project that the economy will grow more slowly in the future than if the baseline year was a year of economic growth. It is also important to note that the baseline year is not necessarily the current year. The baseline year can be any year that is used to

represent the current state of the economy, often due to historical reasons, or because the data for the current year are not yet available. In general, it is important to choose a baseline year that is representative of the current state of the economy to help ensure that the model produces accurate results.

To this end, the year 2021 is used as the baseline year in economic modelling; this year is the most recent year following the COVID-19 pandemic for which official statistics and data needed for the economic modelling are available. Furthermore, 2021 is the year when Namibia started implementing its economic recovery plan, i.e. the Harambee Prosperity Plan II (GRN, 2020), which was formulated in response to the economic downturn and COVID-19 pandemic. Therefore, 2021 is an appropriate starting point for analyzing the potential impacts of the SDG Accelerators.

Appendix IV: Results Based Assessment - reduced SDG result framework.

This section assesses and presents progress that Namibia would make on the SDG indicators in the Result Framework (see Table 1) under SDG Push (SIEG+TSPP) as well as under BAU and SIEG[8]. As mentioned earlier progress is assessed using a simple classification system based on four discrete categories that are color-coded. Thus, *achieved (green), good progress (yellow), slow progress (orange), or no progress (red)*. Progress on an SDG indicator is assigned to one of the four categories is based on the distance of the indicator's endline value from its target value (i.e., if the indicator has a set target) or its baseline value (i.e., if the indicator has no target)[9]. For instance, progress on SDG indicators with set targets – such as SDG 8.1.1 (whose set target is 7%) and SDG 1.2.1 (whose target is 50% reduction in the national poverty headcount ratio) – is classified as:

- achieved, if the endline value is 90% or more of the set target value.
- good progress, if the endline value is between 90% and 50% of the set target value.
- slow progress, if the endline value is between 50% and 30% of the set target value.
- no progress, if the endline value is less than 30% of the set target value.

On the other hand, progress on SDG indicators without targets – such as SDG 8.5.2 and SDG 10.1.1 – is classified as:

- achieved, if the endline value is 90% or more of the baseline value in the desired direction.
- good progress, if the endline value is between 90% and 50% of the baseline value in the desired direction.
- slow progress, if the endline value is between 50% and 30% of the baseline value in the desired direction.
- no progress, if the endline value is less than 30% of the baseline value in the desired direction.

[8] Note that the progress presented here does not include SDG Stimulus as a scenario. Table 3, presented later in the report, shows the progress for all the SDG Push scenarios.
[9] Note that the endline value is the 2030 value while the baseline is the 2021 value.

Table 1: Progress on selected SDG indicators under the BAU, SIEG, and SIEG+TSPP scenarios/policies

				Simulation results and progress[1]		
Indicator	**Metric**	**Target[2]**	**Baseline**	**BAU**	**SIEG**	**SIEG+TSPP**
Prioritized						
SDG1.2.1	National poverty headcount ratio.	9.0%	18.0%	16.5%	15.2%	5.0%
SDG8.1.1	Real GDP growth rate	7.0%	3.5%	2.6%	7.2%	7.2%
SDG8.5.2	Unemployment rate	<	33.4%	29.9%	10.1%	10.1%
SDG10.1.1	Gini coefficient	<	54.6%	54.9%	54.9%	52.7%
Indirectly						
SDG2.3.1	Agriculture productivity, growth rate	>	6.6%	0.9%	9.2%	9.2%
SDG8.2.1	Real GDP per employee, growth rate.	>	1.0%	0.1%	1.5%	1.5%
SDG9.2.1	Manufacturing value added as a share in total value added.	>	12.3%	11.7%	8.6%	13.9%
SDG9.2.2	Manufacturing share in total employment	>	7.4%	7.2%	8.0%	8.0%
SDG10.4.1	Labor income share in GDP	>	44.2%	43.8%	42.0%	43.9%
SDG17.1.1	Government revenue share in GDP	>	32.0%	30.2%	29.5%	30.9%

[1] Simulation results from the CGE-MS model showing the value of the SDG indicators across the scenarios in 2030. The colors in the cells denote progress - i.e., *achieved (green), good progress (yellow), slow progress (orange), or no progress (red).*

[2]The targets are derived from the SDG Result Framework. The "<" symbol means that the SDG indicator has no set target and its decrease over time is desired. On the other hand, ">" means no set target for indicator and its increase is desired.

On-track (target value reaches 90 percent or more)

Off-track - good progress (target value reaches between 50 percent and 90 percent)

Off-track - slow progress (target value reaches between 10 percent and 50 percent)

Off-track - no progress (target value reaches below 10 percent).


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