

ACCELERATING THE SUSTAINABLE DEVELOPMENT GOALS IN ANGOLA

A systemic analysis



Disclaimer

The views expressed and arguments used here do not necessarily represent the official views of the United Nations Secretariat or the United Nations Development Programme (“UNDP”). Any use of information, total or partial, must be accompanied by recognition of Angola as the source.

How to cite this publication:

United Nations, 2024. Accelerating the Sustainable Development Goals in Angola. A Systemic Analysis.

Copyright © 2024

According to the United Nations Development Programme (UNDP) Angola. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by electronic, mechanical, photocopying, recording, or otherwise, without prior permission. The opinions expressed in this publication are those of the authors and do not necessarily reflect the opinion of UNDP.





UNITED NATIONS
ANGOLA



MILLENNIUM
INSTITUTE



FOREWORD



Victor Hugo Guilherme

His Excellency, Minister of Planning of the Republic of Angola

Around nine years ago, the world witnessed the birth of one of the most ambitious and transformative initiatives of our time, the 2030 Agenda for Sustainable Development. Essentially aiming to replace the previous agenda, the Millennium Development Goals which then saw its deadline expire after several years of implementation. The new agenda, centered on 17 Sustainable Development Goals (SDGs), brought as its main novelty greater breadth and inclusion, taking into account economic, social and environmental dimensions.

At that time, thousands of people around the world lived in precarious conditions and extreme poverty, without access to drinking water and basic health care. After several years of implementation, and just a few years left until its end, nations around the world and especially developing countries still encounter great difficulties in meeting the defined goals. These difficulties were further aggravated by the emergence of the COVID-19 pandemic, which disrupted global supply chains, leaving thousands of people unemployed, worsening hunger and poverty, and reversing much of the economic, social and environmental progress that nations have already made. they had achieved.

Recent geopolitical tensions and the effects of climate change have impacted global commodity markets, particularly energy and food. Due to the relevance of these commodities in the cost structure of companies and populations, this scenario triggered a generalized increase in prices in almost all economies, triggering a more aggressive response on the part of the main central banks, making access to financing difficult, therefore delaying, the process of economic recovery and consequently the materialization of the SDGs. And as part of the global system, Angola has also faced these challenges.

This report comes at a very special moment when we have finished reformulating and started implementing two main instruments of the Angolan National Planning System, namely the Long-Term Strategy, Angola 2050 and the National Development Plan (PDN) 2023 -2027. These two instruments are in perfect alignment with the main international treaties to which Angola is a signatory, including the 2030 Agenda.

The systemic and complex nature of the SDGs requires the use of an analytical tool that allows public policymakers to improve their understanding of these complex intersectoral connections, allowing them to calibrate public policies with a holistic perspective of complex systems.

The integrated SDG model, or iSDG model, provides technical assistance to simulate the short- and medium-



term effects of certain policy interventions on achieving the SDGs. In this in-depth technical exercise, the iSDG model allowed us to simulate the short-term effect, until 2030, of selected policy interventions. Based on the priorities of the PDN 2023-2027 and consultations with various Ministerial Departments, the study identifies the health, education, social protection, electricity, agriculture and water and sanitation sectors as accelerators of the SDGs until 2030.

Demonstrating that the prioritization of investments in these accelerators should deserve special attention. As can be seen, it is no coincidence that food security and the valorization of human capital are the two pillars that support the priorities of the PDN 2023-2027.

The results presented in this report raise the need for greater investments in areas considered critical for development and provide ideas for designing an integrated financing strategy for sustainable development that involves public and private, internal and external resources.

I am confident about the great contribution that this report could make to improving our public policies. I believe that this document, in addition to pointing the way, serves as a mechanism to trigger concrete and necessary actions to materialize the aspirations of our population.

I take this opportunity to congratulate the technical teams of all public entities involved in this innovative initiative, as well as the partners at the United Nations Agencies and the Millennium Institute for the quality of their work.

MESSAGE OF THE UNITED NATIONS



Zahira Virani

United Nations Resident Coordinator

It is with great enthusiasm and hope for the future that we present this report on the acceleration of the Sustainable Development Goals (SDGs) in Angola. As a member of the global community committed to achieving a more equitable, inclusive, and sustainable world, Angola stands at a pivotal moment in its history. This report reflects the progress made and the challenges and risks ahead to create a brighter future for all.

This publication is the result of extensive research and analysis to simulate the investments required to fast-track our efforts towards the SDGs in Angola. It underscores the critical importance of targeted and systemic investments in vital sectors such as health, education, social protection, climate action, agriculture, and access to electricity and water. By aligning and leveraging development finance in those areas, we can catalyze meaningful and lasting change, to leave no one behind.

As we chart our path forward, strategic investment and collaborative action are key to unlocking Angola's full potential. This report calls also for the adoption of an Integrated National Financing Framework (INFF) for the SDGs. The analysis provides a key input for the elaboration of an integrated financing strategy that should prompt concrete actions to mobilize investments for the achievement of the SDGs, including the nationally determined contributions (NDCs) under the Paris Agreement on climate change.

The findings presented in this report serve as a reminder that our work is far from complete. The path to sustainable development is a continuous journey that demands our persistent efforts, innovative solutions, and collaborative spirit. It calls upon each of us to remain steadfast in our commitment, to support one another, and to forge ahead with courage and determination to overcome common challenges.

As we reflect on the progress made, let us also look forward with optimism and renewed energy. Let us draw inspiration from the successes detailed in this report and use them as a foundation to build an even more inclusive and sustainable Angola. By working together, we can accelerate our journey towards the SDGs, promoting a more inclusive, gender-responsive and equitable pathway.

In closing, we extend our deepest gratitude to all those who have contributed to this analysis. Let this report be a testament to our collective achievements and a call to action for the future. Together, we can and will create a prosperous, sustainable, and inclusive Angola.

ACKNOWLEDGMENTS

This report is the result of intense technical work carried out over more than eighteen months. A national team was created led by the Ministry of Planning together with the Ministry of Finance and the National Statistics Institute (INE), with technical support from the Millennium Institute and technical coordination from UNDP. The project was made possible thanks to funding from UNDP, UNICEF, WHO, UNFPA and UNHCR.

Coordination: Lorenzo Mancini (UNDP).

Millennium Institute: Carla Susana Assuad; Fernando Redivo.

Technical team: Martins Afonso (MINPLAN); Abel Soma Bonga (MINPLAN); José Zatula (MINPLAN); Graciano Miguel (MINPLAN); Isamara Cruz (MINFIN); Wilson Simão Figueiredo (MINFIN); João Hebo (INE); Valente Morais (INE); Carlos Afonso (INE); Lorenzo Mancini (UNDP); Andrea Antonelli (Office of the UN Resident Coordinator); Monahulo Sousa (UNICEF); Edgar Muinga (Design, UNDP)



CONTENT

1. INTRODUCTION	1
1.1 SDG trends in Angola	2
1.2 Interlinkages across the SDGs	4
1.3 The 2023-2027 National Development Plan (NDP)	5
2. METHODOLOGY	6
2.1. The Angola iSDG model	6
2.2. Simulated interventions	6
2.3. Financing sources	8
3. RESULTS	9
3.1. Effect of the investments on the SDGs	9
3.2. Effects of the investments on the SDGs in the reference scenario	10
3.3 Financing the SDGs	12
4. CONCLUSIONS	15
REFERENCES	16
ANNEXES	17
A. The iSDG model	17
B. Limitations	23
C. Data sources	24
D. Identification of the SDG accelerators	26
E. Cost of interventions	27
F. Additional results	29
G. Selected SDG indicators used in the model	30



FIGURES

Figure 1. The Sustainable Development Goals (SDGs)

Figure 2. Trends in SDG targets in the world

Figure 3. Trends in SDG targets in Angola

Figure 4. Example of interlinkages of the SDG 15.1 target with other SDG targets

Figure 5. Pillars of the 2023-2027 National Development Plan (NDP)

Figure 6. Achievement of the SDGs by 2030 under different scenarios

Figure 7. Achievement of the SDGs by 2030 under the reference scenario

Figure A. Sectors represented in the iSDG model

Figure B. Example of a feedback loop diagram

TABLES

Table 1. Policy interventions simulated in the iSDG Model

Table 2. Comparison of investments analyzed in the iSDG Model with the national budget and the nationally determined contributions

Table 3. Overview of resources for an integrated SDG financing strategy

Table A. Scenarios analyzed in the iSDG-Angola Model

Table B. Primary data sources used in the iSDG-Angola Model

Table C. Cost estimates used in the simulation

Table D. Estimated achievement of the SDGs by Goal

Table E. Estimated achievement of the SDGs

Table F. Selected SDG indicators used in the Angola iSDG Model

ABBREVIATIONS

DRM	Domestic Resource Mobilization
ENAC	National Strategy for Climate Change
GDP	Gross Domestic Product
IIMS	Multiple Health Indicator Survey
INE	National Institute of Statistics
INFF	National Integrated Financing Framework
iSDG	Integrated Model of Sustainable Development Goals
Kz	Kwanza
LDC	Least Developed Country
MINFIN	Ministry of Finance
MINPLAN	Ministry of Planning
MTEF	Medium-Term Expenditure Framework
MTFF	Medium-Term Fiscal Framework
NDC	Nationally Determined Contributions
NDP	National Development Plan
OGE	General State Budget
SDG	Sustainable Development Goals
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations Children's Fund
US\$	U.S. dollar
WHO	World Health Organization



EXECUTIVE SUMMARY

With approximately five years to go before achieving the 2030 Agenda for Sustainable Development, global progress on more than 50 percent of the Sustainable Development Goals (SDG) targets is weak and insufficient; in 30 percent of the targets, the world stagnated or went backward.

The transformations necessary to achieve the SDGs require significant public and private investments. Countries are facing enormous challenges in achieving the SDGs. Faced with this challenge, the Secretary-General of the United Nations launched the SDG Stimulus initiative to boost additional investments for sustainable development, by at least US\$500 billion per year globally. Sustainable development and development financing featured prominently in the Pact for the Future, adopted by the United Nations at the Summit of the Future in 2024.

This report examines the estimated short-term effect of selected policy interventions on achieving the SDGs. The analysis is performed using the iSDG model. It is a tool based on System Dynamics that allows you to study the interconnections and iterations between the SDGs. Specifically, the model investigates the effect of investments in key areas aligned with the priorities of the 2023-2027 National Development Plan (NDP) and the Long-Term Strategy, Angola 2050.

The results highlight the positive effects of achieving the SDGs of investments in key sectors, including health, education, social protection, agriculture and access to electricity and water. Additional investments in those areas would significantly increase the achievement of the SDGs in Angola by 2030. However, achieving some SDG targets requires structural and profound transformations that can only be analyzed from a longer-term perspective.

More specifically, the results point to the following conclusions:

- **SDG accelerators:** The health, education, social protection, climate action, electricity, agriculture, and water and sanitation sectors have been identified as key SDG accelerators for 2030. Increased investments in these areas would not only yield direct benefits but also create synergistic effects that accelerate progress toward other SDGs. Additionally, some investments, such as in education, produce long-term impacts that extend beyond 2030. The iSDG model can capture these long-term effects and assess interventions aligned with the socio-economic transformation envisioned in Angola's 2050 strategy.
- **Development as an investment proposal:** Two additional investment scenarios were simulated, at 2 percent and 5 percent of GDP annually from 2024 to 2030. Considering the most recent estimates of the value of Angola's GDP, those additional investments are estimated between US\$14.7 billion and US\$36.8 billion accumulated between 2024 and 2030. The simulations indicate that increasing investments in critical development areas will significantly accelerate Angola's progress toward achieving the SDGs by 2030. Prioritizing investments in these SDG accelerators should therefore receive special attention. Notably, if investments exceed current levels, SDGs 2 (Zero Hunger) and SDG 6 (Clean Water and Sanitation) would see significant positive impacts in

the short term. It is interesting to note that these sectors coincide with those identified in the nationally determined contributions (NDCs) established by the Paris Agreement, as well as in the Angola SDG Investor Map.

- **Development financing strategy:** A key corollary of the previous point is the need to increase financing for sustainable development. An integrated financing strategy should be adopted to define concrete actions to mobilize public and private, internal and external resources. Carrying out an initial mapping, based on the assumptions of the Medium-Term Fiscal Framework (MTFF) and the Medium-Term Expenditure Framework (MTEF), could help identify existing gaps, as well as the actions needed to increase the scale of the financing. The integrated financing strategy should address the financing of the NDCs.
- **Data:** The analysis underscored the need to enhance the quality, disaggregation, and frequency of data collection. A lack of statistical information for certain SDG indicators limits the ability to model and simulate progress toward achieving the goals. The iSDG model can be updated at any time, incorporating data from sources such as the Multiple Health Indicator Survey (IHMS) and the Population Census, among others. However, to ensure continuous SDG monitoring, strong coordination among various ministries and relevant departments is essential. Establishing a task force on SDG data, involving all key public and private stakeholders, is highly recommended.

Overall, the iSDG model guides the need to expand investments in critical areas to accelerate the achievement of the SDGs in Angola by 2030. The results are a starting point for defining a national financing strategy for the SDGs.



1. INTRODUCTION

1. The 2030 Agenda for Sustainable Development, adopted in September 2015 by the United Nations General Assembly, constitutes an ambitious action plan to achieve the Sustainable Development Goals (SDGs) by 2030 (Fig. 1).
2. Halfway to 2030, global progress on more than 50 percent of SDG targets is weak and insufficient; in 30 percent of the goals, the world stagnated or went backward¹. Around half of the 140 SDG targets for which sufficient data is available deviates from the required path.²
3. The transformations needed to accelerate the SDGs require significant public and private investments. Developing countries are bearing the burden of a collective failure to invest in the SDGs while facing higher capital costs and significantly worse access to finance.³
4. The United Nations Secretary-General launched the SDG Stimulus initiative to drive additional investment for sustainable development and climate action, by at least US\$500 billion per year, combining concessional and non-concessional resources.⁴
5. Angola presented the Voluntary National Review in 2021. The document was prepared based on consultations with public and private sector partners brought together under the “SDG Platform” led by the Ministry of Planning. The report showed progress in several areas, including health, education and infrastructure.
6. However, making economic growth inclusive, and addressing multidimensional poverty and inequalities remains a challenge due to structural factors, including limited diversification of the productive structure. The iSDG model attempts to fill the lack of information about SDG accelerators, that is, those interventions that have a systemic effect on achieving the Goals.
7. In this context, it is critical to address three key questions for Angola:
 - i. What are the SDG trends?
 - ii. To what extent can additional investments impact achieving the SDGs?
 - iii. How to finance the investments needed to accelerate the SDGs?

Figure 1. The Sustainable Development Goals (SDGs)

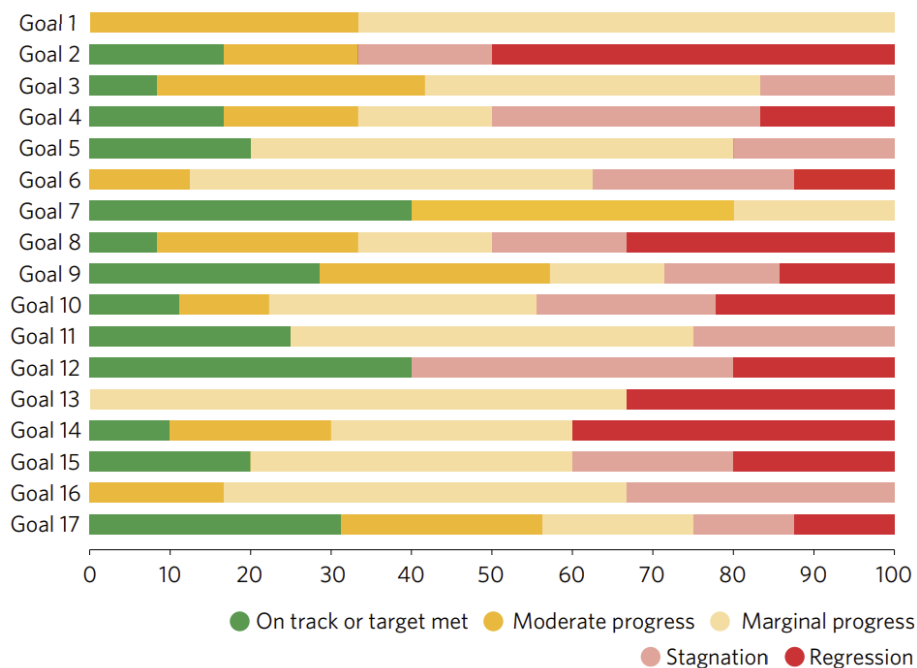


Source: United Nations



8. Figure 2 provides an assessment of global trends to measure progress toward each goal, using trend data between the 2015 baseline year and the most recent year. Among the 169 SDG targets, 135 can be assessed using available global trend data from the 2015 baseline to the most recent year, along with custodian agency analyses; 34 targets lack sufficient trend data or additional analysis. Among the assessable targets, only 17 percent display progress sufficient for achievement by 2030. Nearly half (48 percent) exhibit moderate to severe deviations from the desired trajectory, with 30 percent showing marginal progress and 18 percent moderate progress.
9. Among global assessable SDG targets (135 out of 169 targets), only 17 percent are on track to be achieved by 2030. Nearly half (48 percent) of assessable targets exhibit moderate to severe deviations from the desired trajectory. Furthermore, 18 percent of these targets have not seen any progress and 17 percent have regressed below the 2015 baseline.

Figure 2. Trends in SDG targets in the world (based on assessed targets, in percentage)



Source: United Nations, 2024. The Sustainable Development Goals Report 2024

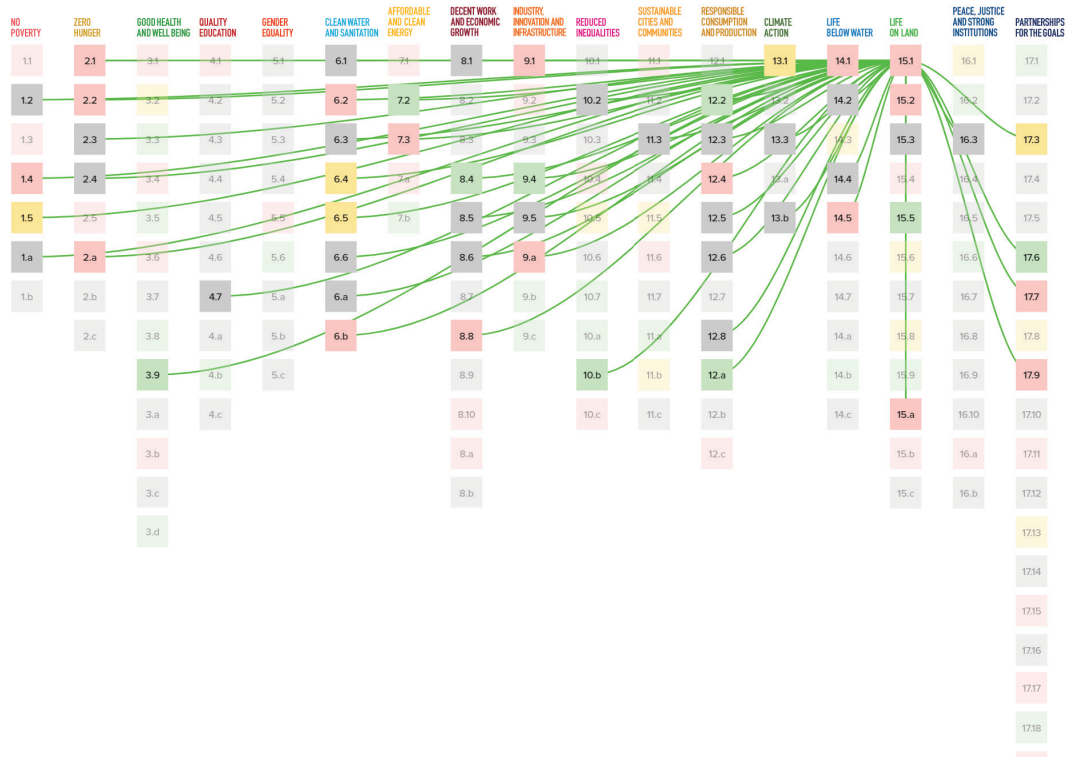
1.1 SDG trends in Angola

10. Drawing on the previous Section, Angola’s performance with the SDGs should be analyzed. Figure 3 shows the country’s progress in achieving the Goals by 2030.
11. The green segments indicate the SDG targets in which Angola is on track; the yellow refers to the goals that have made reasonable progress but need to be redoubled efforts to achieve the objectives by 2030. Those in red are the SDG targets about which the country is not on track. Finally, the gray color shows SDG targets for which no information is available.
12. It is noteworthy that most targets lack statistical information to fully assess progress, which points to the challenge of data collection to monitor the SDG indicators.

1.2 Interlinkages across the SDGs

13. The SDGs cannot be thought of individually, in a silo. Understanding the systemic and dynamic interactions across social, economic and environmental factors of development is essential to promoting the SDGs. The interlinkages show how actions aimed at one Goal can influence others, which can guide policies. For example, health depends on a wide range of economic and social determinants, such as multidimensional poverty, access to education, social protection, etc.
14. Figure 4 shows an example of the existing interlinkages across the SDGs in Angola, using SDG 15, which oversees life on Earth, as a reference. The SDG 15.1 target has 56 synergies with other targets. The interactions are most notable with the goals in the field of environment and climate (SDGs 13, 14 and 15); however, there are synergies with other dimensions, for example, food security and health, due to the effects that climate change has on these sectors.

Figure 4. Example of interlinkages of the SDG 15.1 target with other SDG targets



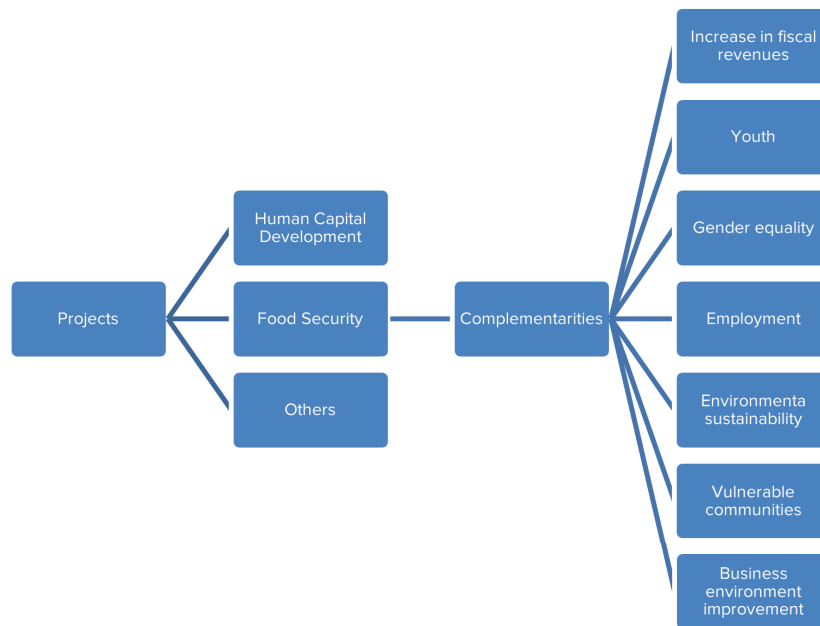
Source: UNDP. SDG Insights Report. Available at: <https://sdgdiagnostics.data.undp.org/AGO/synergies-and-tradeoffs>. Note: Interlinks at the target level are based on the most recent methodology available through the European Commission's KnowSDGs platform. A first review of the literature (Miola et al., 2019) was updated and expanded in 2021-2022 by a team of researchers who retrieved and analyzed all relevant scientific literature on the interconnections of the SDGs, both in Scopus and Google Scholar.

15. Due to the systemic and complex nature of the SDGs, it is necessary to adopt an analytical tool to try to understand the interactions between different sectors and policy interventions. In this sense, the iSDG model provides a solution based on System Dynamics that allows simulation of short and medium-term effects of selected interventions from the 2023-2027 NDP on achieving the SDGs.

1.3 The 2023–2027 National Development Plan (NDP)

16. The Government of Angola approved the 2023–2027 National Development Plan (NDP). The two major pillars that constitute the drivers of the development process are:
- i. Development of human capital: reinforce the qualification level of Angolans to provide them with more and better opportunities to significantly raise their standard of living;
 - ii. Food safety: significantly increase national production, protecting the country from dependence on the outside world, and ensuring that all Angolans have access to a balanced diet that allows them to fully realize their potential.
17. The 2023–2027 NDP investments that do not directly impact these development drivers will be hierarchized into a category aggregating other social and economic effects (Fig. 5). In the 2023–2027 NDP, the allocation of public resources prioritizes investments that reinforce those two pillars, without which it will not be possible to achieve the development objectives proposed in the different sectors concerning economic activities and social life.

Figure 5. Pillars of the 2023–2027 National Development Plan (NDP)



Source: Government of Angola



2. METHODOLOGY

2.1. The Angola iSDG model

18. The iSDG Angola model aims to support development planning through short-term analysis at the national level, integrating economic, social and environmental aspects. Its scope and level of aggregation make it a key tool to support detailed analysis of different government strategies (Allen et al., 2016).
19. The model offers projections based on real historical data and seeks to improve understanding of complex intersectoral connections, allowing them to approach the design of public policies with a holistic perspective of complex systems. A detailed description of the methodology is available in the Annex.

2.2. Simulated interventions

20. Based on the priorities of the 2023-2027 NDP, and in consultations with key Ministries, it was decided to analyze nine investment domains: health, education, environment and climate action, agriculture, manufacturing, energy, road infrastructure, water and sanitation, and social protection.
21. The model simulates policy interventions under three scenarios – Reference, Positive and Adverse – which reflect different assumptions about average oil prices and production, and governance indicators. The methodology used to assess the achievement of the SDGs is aligned with the approach outlined in the United Nations Global Sustainable Development Report 2023.
22. Interventions were tested in the iSDG model in the form of additional investment. This is defined as an investment supplement to implement any public policy of the 2023-2027 NDP. It is considered additional because it is incremental to what is being implemented through the General State Budget (OGE in Portuguese) 2024⁵.
23. The simulations in the different scenarios were designed based on consultations with the Ministries. Two simulations were proposed. The first considers an additional investment of 2 percent of GDP, each year, between 2024 and 2030. This hypothesis focuses on human capital and agriculture, in line with the two main pillars of the 2023-2027 NDP.
24. The threshold of 2 percent of annual GDP was defined considering the investment of the 2024 national budget as a benchmark. The budget allocated 6.3 percent of annual GDP to the nine investment domains analyzed in the model (Table 1). Therefore, considering an additional investment of 2 percent is equivalent to an increase of approximately one-third above the investment foreseen in the 2024 national budget.
25. The second simulation considers an additional investment of 5 percent of GDP, each year, between 2024 and 2030. Following the reasoning presented in the previous paragraph, that value corresponds to an increase of more than two-thirds over the 2024 national budget's investments (in the nine domains analyzed). This simulation with 5 percent of GDP is less viable than the first one, owing to the enormous fiscal effort requested to meet the investment level; however, the exercise provides useful guidance for defining the SDG financing strategy.
26. Table 1 shows the nine intervention domains grouped into two areas: Human Capital, which covers domains 1 to 4, and Productive Sectors, which includes domains 5 to 9. Both investments foreseen in the 2024 national budget are presented such as the hypotheses of additional investment of 2 percent and 5 percent of GDP, detailing how they are distributed across different domains.

Table 1. Policy interventions simulated in the iSDG Model

Group	Domain	Baseline investment ^a (percent of GDP)	Intervention	Additional investment of 2 percent annually	Additional investment of 5 percent annually	SDGs prioritized ^f
Human capital	1. Health	1.9	Health	+0.3	+0.75	3, 5
			Family planning	+0.1	+0.25	
	2. Education	2.1	Education	+0.4	+0.75	4, 5, 8
	3. Water and sanitation	0.6 ^b	Water management	+0.1	+0.25	3, 6, 11
			Basic sanitation	+0.1	+0.25	
4. Social protection	1.2	Cash transfers	+0.5	+0.8	1, 3, 5, 10	
Productive Sectors	5. Environment and climate action	<0.1	Adaptation to climate change	-	+0.13	6, 13, 14, 15
			Environmental protection	-	+0.13	
			Marine protection	-	+0.13	
			Reforestation and afforestation	-	+0.13	
	6. Agriculture	0.2	Livestock	+0.1	+0.15	1, 2, 6, 9, 10, 11, 12, 13
			Fisheries	+0.1	+0.15	
			Subsidies to fertilizers	+0.1	+0.15	
			Capacity building on sustainable agriculture	+0.1	+0.15	
			Irrigation	+0.1	+0.15	
	7. Manufacturing industry	<0.1 ^c	Manufacturing	-	+0.20	8, 9
	8. Energy	0.2 ^d	Solar and hydroelectric energy	-	+0.25	7
	9. Road infrastructure	0.1 ^e	Road paving	-	+0.25	9
		Total	6.3%		6.3%+2%	6.3%+5%

Notes: a) Investment foreseen in the 2024 Budget Law; b) Includes Water Supply and Basic Sanitation; c) Excludes Extractive Industry and excludes Construction; d) Includes Electricity and Non-Electrical Energy, but excludes Oil and Gas; e) Refers to Road Transport; f) See the SDG indicators in Annex G.

2.3. Financing sources

27. Scaling up public and private financing sources is crucial to deliver the additional investment simulated in the iSDG model. In the scenario of additional investment of 2 percent of annual GDP, it was assumed that the financing source would be public, with 60 percent coming from taxes on income and profits and 40 percent from taxes on goods and services.
28. Under the scenario of additional investment of 5 percent of annual GDP, the financing strategy was assumed to rely on private investments, 70 percent of the total, complemented by public resources, 30 percent of the total. This assumption is aligned with the guidelines received by the Ministries consulted, including the existing budget guidelines, which aim to promote the continuity of fiscal policies while encouraging private financing of the SDGs.
29. It is noteworthy that the iSDG model allows these assumptions to be changed. Other scenarios can be tested, including choosing a different mix of public and private resources to realize the additional investment.

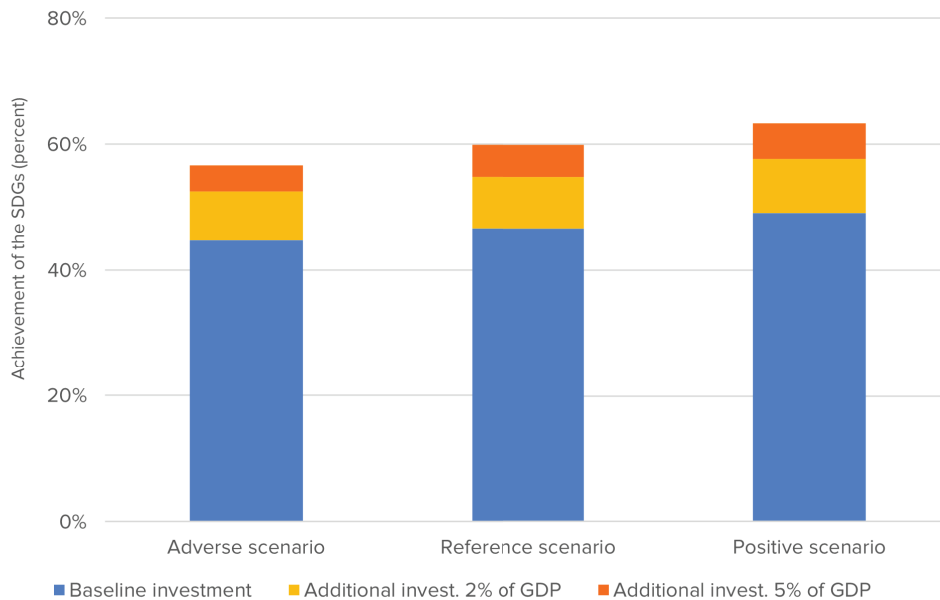


3. RESULTS

3.1. Effect of the investments on the SDGs

- 30. The simulation of the achievement of the SDGs was conducted under three scenarios – Reference, Positive and Adverse – considering the investments foreseen in the 2024 national budget, as well as the hypotheses of additional investment of 2 percent and 5 percent of GDP each year, between 2024 and 2030.
- 31. Figure 6 shows the major findings. Without additional investments, that is, maintaining the investment level foreseen in the 2024 national budget, it is estimated that 47 percent of the SDG targets may be achieved by 2030 under the Reference scenario. In the Adverse and Positive scenarios, the model estimates that between 45 percent and 49 percent of the SDGs will be achieved by 2030, respectively.
- 32. Considering an additional investment of 2 percent of annual GDP, an improvement in achieving the SDGs is estimated in all three scenarios. This effect is greater with an additional investment of 5 percent of annual GDP, which is due not only to the larger financing but also because of a broader scope of interventions (Table 1). The estimated achievement of the SDGs exceeds 60 percent under the Positive scenario.

Figure 6. Achievement of the SDGs by 2030 under different scenarios



Source: Own elaboration based on the iSDG model. Note: the baseline investment refers to the budgeted expenditure approved in the 2024 Budget Law. See also Annex.

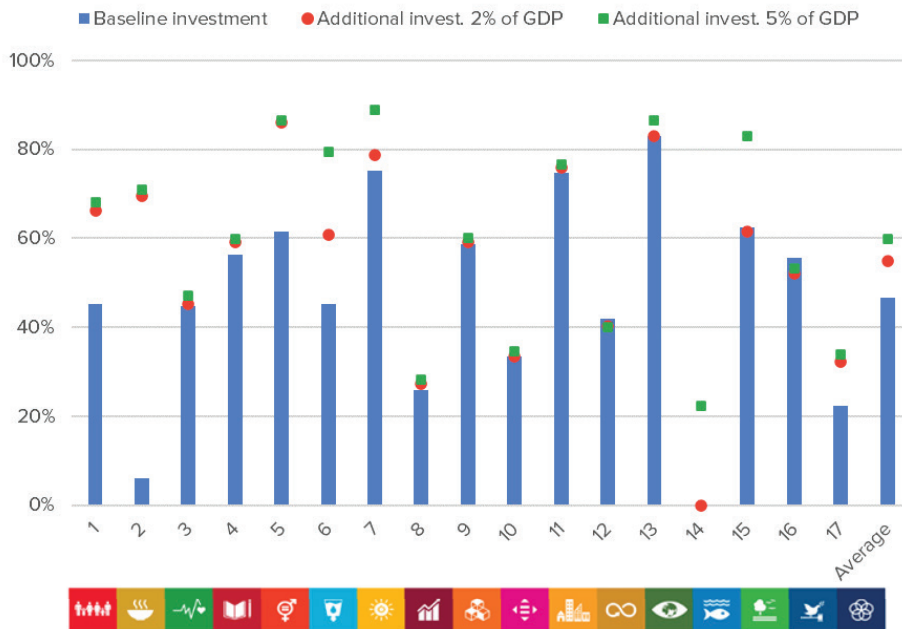
- 33. In the Positive scenario – characterized by increased oil prices and production, as well as favorable governance indicators – Angola would experience greater economic growth. Due to the country’s dependence on oil revenues⁶, an economic expansion might provide more fiscal space for investments in SDG-oriented policies. On the contrary, in the Adverse scenario – characterized by a decrease in oil prices and production, and unfavorable governance indicators – the model estimates moderate economic growth and tighter fiscal space for investments in the SDGs (see Annex A).



3.2. Effect of the investments on the SDGs in the reference scenario

34. This subsection focuses on the Reference scenario⁷ for simplicity of analysis. The objective is to investigate how variations in investment levels can influence the achievement of the SDGs. The methodological notes and results are illustrated in the Annex.
35. Figure 7 shows the estimated attainment of the SDGs, under the Reference scenario, considering both the baseline investments – foreseen in the 2024 national budget – and the additional investments of 2 percent and 5 percent of GDP.

Figure 7. Achievement of the SDGs in 2030 under the reference scenario



Source: Own elaboration based on the iSDG model. Note: the baseline investment refers to that provided for in the 2024 Budget Law

36. The SDGs have different sensitivity to additional investments. SDG 2 (Zero hunger) is the objective that responds most immediately and positively to an expansion of investment, going from 6 percent of SDG targets achievement, in the base scenario, to 70 percent and 71 percent with additional investments of 2 percent and 5 percent of GDP, respectively. A key intervention in this area is the expanded access to fertilizers, which boosts agricultural production and contributes to food security.
37. SDG 6 (Clean water and sanitation) also shows a significant improvement in performance by 2030, going from 45 percent of SDG targets achievement, in the base scenario, to 61 percent and 80 percent of attainment, with additional investments of 2 percent and 5 percent of GDP, respectively. In other words, food security and access to water are vital sectors for sustainable development.
38. On the other hand, SDG 3 (Quality health) and SDG 4 (Quality education) show a modest increase in achieving the goals, even with additional investments of 2 percent and 5 percent of GDP. A possible interpretation of this is the time needed for investments in health and education to produce tangible impacts on the indicators. Structural transformations to achieve improvements in primary health care, literacy and years of schooling require a longer time horizon, as well as a set of actions in different sectors, e.g., social determinants of health.

39. In other words, the simulation carried out here covers a relatively short period (until 2030) to fully detect the long-term effect of education. Despite that, health and education are considered accelerators of the SDGs due to their systemic and positive effects on other areas of development, as will be explained later.
40. SDG 7 (Affordable and clean energy) presents the highest performance under the assumption of additional investment of 5 percent of annual GDP and also has the second-best performance in other cases. Additional investments in the energy sector have multiplier effects on other SDGs, as this is a vital sector for the country's development.
41. SDG 9 (Industry, innovation and infrastructure) captures the trends of economic diversification and transformation through the development of the industrial sector and its driving elements, including investments in technical and vocational education and training, infrastructure and Research and Development, in line with the vision mirrored in the long-term strategy, Angola 2050. This transformation process can take a long time and, given that this report focuses on the short term with the absence of some data, the impact of the main investments for the targeted economic transformation is not significant.
42. The achievement of SDG 10 (Reduced inequalities) targets appears modest, even with a notable increase in financing. A possible explanation is that reducing socioeconomic inequalities requires a set of complex and integrated policies, which go beyond the areas analyzed in the model. Analysis of the effect on SDG 8 (Decent work and economic growth) requires special care. As illustrated in Figure 2, of the twelve targets of this Goal, only one is on track and there is no data on eight targets of the SDG 8, which strongly limits the analysis.
43. SDG 17 (Partnerships and means of implementation) also shows limited improvement, including under the assumption of additional financing. This seems to suggest that the effectiveness of partnerships depends more on the quality and strategy of the collaborations than on the volume of funding itself. It is also noteworthy that SDG 17 includes very heterogeneous goals that are not directly interconnected with the areas analyzed in the iSDG model; for example, the use of technologies, international trade and capacity building. However, SDG 17 includes a crucial target for development financing, which has to do with mobilizing domestic resources (SDG target 17.1).
44. On average, an additional investment of 5 percent of annual GDP boosts the achievement of the SDGs compared to the financing of 2 percent of annual GDP. That happens not only due to the higher volume invested but also due to the greater scope of the intervention domains that are assumed under the additional investment of 5 percent of GDP (Table 1).
45. SDG 13 (Climate action), SDG 14 (Life in water) and SDG 15 (Life on land) show notable progress only in a 5 percent additional investment scenario. A possible explanation has to do with the complexity of these SDGs related to environment and climate action, which require interventions in multiple sectors (not only in agriculture and human capital, as assumed in the scenario of additional investment of 2 percent of GDP). In this sense, a deeper analysis of the interventions included in the nationally determined contributions (NDCs) is recommended, including a study of climate financing mechanisms for Angola. The update of the country's NDCs in 2025 presents an opportunity in this regard.
46. The simulations point to the potential effect of additional investments on achieving the SDGs. This effect varies considerably across the SDGs and is sensitive to the period of analysis; some Goals require structural transformations in the medium and long term, beyond 2030. The research findings may guide the prioritization of sectors or areas with the greatest accelerating effect on the SDGs. This issue will be addressed in the following subsection.



3.3. Financing the SDGs

47. The political declaration agreed at the Sustainable Development Goals Summit in 2023 highlighted that the transformations expected to achieve the SDGs require huge public and private investments. Developing countries are bearing the brunt of the global failure to invest in the Goals. Urgent measures are needed to mobilize large-scale financing to close the development financing gap, now estimated at US\$4.2 trillion annually, up from the US\$2.5 trillion forecast before the COVID-19 pandemic⁸. Sustainable development and development financing featured prominently in the Pact for the Future, adopted by the United Nations at the Summit of the Future in September 2024. Action 1 of the Pact for the Future states that “We will take bold, ambitious, accelerated, just and transformative actions to implement the 2030 Agenda, achieve the Sustainable Development Goals and leave no one behind”.
48. The International Monetary Fund (IMF) estimates that Angola to achieve, by 2030, the SDG targets in the critical human capital and infrastructure sectors of high-performing countries in a similar income group would require additional annual expenditure of 20.8 percent of GDP, every year from now until 2030: Education (8.3 percent of GDP), Health (5.7 percent of GDP), Water and Sanitation (2.1 percent of GDP), Electricity (1.2 percent of GDP) and Road Infrastructure (3.5 percent of GDP). The additional annual expenditure for Angola is about 1.5 percent of GDP higher than the Sub-Saharan African average⁹. According to the IMF methodology, in the baseline scenario, Angola is not expected to achieve the SDGs until 2052 (the last year considered by the IMF financing tool). Alternatively, in a reform scenario, the country can make considerable progress towards achieving its SDGs in a much shorter time frame (by 2040) than in the reference scenario and achieve much higher real GDP per capita.
49. In this context, the Secretary-General of the United Nations launched the SDG Stimulus initiative, which requires a significant increase in funding for projects focused on the SDGs, by at least US\$500 billion per year¹⁰. This initiative recommends implementing national policies to better align and coordinate all financing streams with the SDGs through an Integrated National Financing Framework (INFF).¹¹
50. The INFF is a framework that aims to define how to finance the 2023-2027 NDP priorities and the SDGs simultaneously. A key action would be to adopt an Integrated Financing Strategy for the SDGs that establishes concrete steps to mobilize public and private, internal and external resources. Therefore, it is helpful to briefly review the financing needs of the major development strategies and national budget.
51. It is noteworthy that the Long-Term Strategy, Angola 2050, foresees a total cumulative investment to meet its objectives of around US\$1 trillion between 2023 and 2050.¹²
52. The financing needs of Angola’s NDCs, between 2020 and 2025, are estimated at approximately US\$44 billion for mitigation actions, and US\$144 million for adaptation¹³.
53. The 2024 Budget Law projects gross financing needs of 13.7 percent of GDP for 2024, owing to debt repayment (13.3 percent of GDP) and the capitalization of public funds and companies (0.4 percent of GDP)¹⁴.
54. Against this backdrop, the iSDG model has analyzed three hypotheses: i) a baseline scenario, using the 2024 national budget’s investments as a benchmark; ii) an additional investment of 2 percent of annual GDP; and iii) an additional investment of 5 percent of annual GDP (Table 2). Considering the most recent estimates of the value of Angola’s GDP¹⁵, those additional investments are estimated between US\$14.7 billion and US\$36.8 billion accumulated between 2024 and 2030.

55. The percentages of additional investment (2 percent and 5 percent of GDP) were established based on the recommendations of the Ministries consulted, considering the feasibility of mobilizing such financing until 2030, regardless of the achievement of the SDGs. This is because, as the iSDG model shows, achieving one hundred percent of the SDGs would require a huge volume of investment in the five years left until 2030.

Table 2. Comparison of investments analyzed in the iSDG model with the national budget and the nationally determined contributions (NDC)

Domain	Annual amount (percent of 2024 GDP)
iSDG model estimations, baseline investment scenario ^a	6.3
iSDG model estimations, additional investment of 2 percent of GDP scenario ^a	8.3
Financing needs across the sectors considered in the 2020-2025 nationally determined contributions (NDCs) ^b	9.5
iSDG model estimations, additional investment of 5 percent of GDP scenario ^a	11.3
Gross financing needs of the 2024 national budget ^c	13.7
Annual budgeted expenditure in the 2024 national budget ^c	33.7

Notes: a) Refer to the nine investment domains analyzed in the iSDG model (see also Table 1); b) Annual average over the five years, 2020-2025; includes adaptation and mitigation; c) See the 2024 Budget Law.

56. Within this context, designing an integrated financing strategy is crucial to mobilize the investments foreseen in the 2023-2027 NDP and to accelerate the SDGs. Drawing on the experience of other countries that have adopted the INFF, the strategy should consider several actions (Table 3):

57. Strengthen domestic resource mobilization (DRM) as a long-term route to financing sustainable development¹⁶. Fiscal policy and tax policies play a critical role in raising revenue and in influencing behavior, for example, in promoting climate action. In Least Developed Countries (LDCs), DRM there tends to be more scope to increase revenues through fiscal policy or administrative fiscal reforms than by cutting public expenditure in critical areas such as health or education. A progressive tax system is also vital to having a deeper social contract. This also involves strengthening institutional and technical capabilities on tax auditing, including transfer pricing, compliance risk management, reform of property registration, measures against the erosion of the internal tax base and profit shifting¹⁷, combating illegal financial flows and strengthening digitalization of tax administration. Some ongoing initiatives include the Tax Inspectors Without Borders and the Tax for SDGs.

58. Promote the attraction of private investments with an impact on the SDGs. Facilitating greater private sector involvement in the economy is crucial to accelerating the diversification process in the non-oil sector. Angola has made efforts to improve the business environment, positioning the country as an attractive market at a regional and global level. The Angola SDG Investor Map can be a key tool; the Map identifies sectors that offer opportunities for both private investment and to promote the SDGs. Some countries have also considered the engagement of nationals in the diaspora, including the mobilization of remittances for productive investments in the home country.

59. Strengthen the alignment of public financial management with the SDGs to integrate the Goals into the budget cycle and strategic budget processes, including the Medium-Term Fiscal Framework (MTFF)

and the Medium-Term Expenditure Framework (MTFF), in line with the Public Finance Sustainability Law¹⁸. For example, some countries introduced a system of coding and marking of the SDGs in the national budget. The citizen's budget, the participatory budget and the gender-responsive budget are crucial instruments for aligning public financial management with the SDGs. Debt swaps for climate and nature and green or blue bonds are additional tools to be considered. Angola adopted the Operational Framework for Sustainable Finance through Presidential Decree 106/23, which aims to ensure that the funds mobilized by the country through green and social instruments will finance a set of eligible projects and expenditures.


60. Boost climate finance. The Paris Agreement on climate change includes several mechanisms that can contribute to expanding the scale of climate financing in line with the 2022-2035 National Strategy for Climate Change (ENAC) and NDCs. This may need institutional and technical strengthening to improve the country's preparedness to tap into the internationally transferred mitigation outcomes (ITMOs) established by Article 6 of the Paris Agreement¹⁹. The update of Angola's NDCs by 2025 represents a key opportunity to update the financing needs and define an action plan for climate finance. Other interventions could be considered, including carbon pricing instruments such as compliance and voluntary carbon markets.

61. Adopt insurance and risk financing. Sovereign risk financing focuses on sovereign risk and the protection of large pools of public goods through one or multiple layers of financial instruments. This area requires strengthening capacities to model, analyze and articulate risks, as well as developing comprehensive long-term risk financing strategies and building risk financing solutions, together with the private sector.

62. Promote blended finance for strategic use of development finance to mobilize commercial finance for sustainable development. It has the potential to unlock private sector financing needed to fill the SDG financing gap, especially if applied in coordination with technical assistance, policy reforms and market development initiatives. However, due to the complexity of this type of financing, a risk assessment is necessary, as well as adaptation to the specific context in which it is applied.

63. Mobilize additional support from the international community. This action aims to expand the scale of concessional resources from bilateral or multilateral donors, including official development assistance to LDCs.

Table 3. Overview of resources for an integrated SDG financing strategy

Public	Internal financing	External financing
	<ul style="list-style-type: none"> • Broadening the tax base • General state budget • Domestic debt management • Taxes on tobacco, alcohol, etc. • Combating illicit financial flows • Local taxation • National development banks • SDG impact investments • Business environment reforms • Financial Institution • Venture capital investment • Pension funds • Sustainable finance • Insurance and risk finance • Blended finance 	<ul style="list-style-type: none"> • External debt management • Multilateral development banks • Development finance institutions • Export credit agencies • SDG impact investments • Foreign direct investments • Green bonds, blue bonds, etc. • Climate finance under Article 6 of the Paris Agreement • Remittances • International banks • Sustainable finance • Official Development Assistance • Foundations and org. faith-based
Private		

Source: Own elaboration based on the integrated financing strategy of Nigeria, Indonesia and Uganda. The table is not intended to be an exhaustive list but merely to summarize the main tools in use.





4. CONCLUSIONS

64. The iSDG model simulates the short-term impact of selected policy interventions up to 2030. Guided by the priorities of the 2023-2027 National Development Plan (NDP) and consultations with key ministries, the research focuses on nine investment areas: health, education, environment and climate action, agriculture, manufacturing, energy, road infrastructure, water and sanitation, and social protection.
65. The results indicate that additional investments in these nine areas would substantially enhance Angola's progress toward achieving the SDGs by 2030. However, meeting certain SDG targets requires structural transformations that can only be fully assessed from a broader, long-term perspective. In this context, further simulations could offer valuable insights.
66. More specifically, the findings point to the following conclusions:
- **SDG accelerators:** The health, education, social protection, climate action, electricity, agriculture, and water and sanitation sectors have been identified as key SDG accelerators for 2030. Increased investments in these areas would not only yield direct benefits but also create synergistic effects that accelerate progress toward other SDGs. Additionally, some investments, such as in education, produce long-term impacts that extend beyond 2030. The iSDG model can capture these long-term effects and assess interventions aligned with the socio-economic transformation envisioned in Angola's 2050 strategy.
 - **Development as an investment proposal:** Two additional investment scenarios were simulated, at 2 percent and 5 percent of GDP annually from 2024 to 2030. Considering the most recent estimates of the value of Angola's GDP, those additional investments are estimated between US\$14.7 billion and US\$36.8 billion accumulated between 2024 and 2030. The simulations indicate that increasing investments in critical development areas will significantly accelerate Angola's progress toward achieving the SDGs by 2030. Prioritizing investments in these SDG accelerators should therefore receive special attention. Notably, if investments exceed current levels, SDGs 2 (Zero Hunger) and SDG 6 (Clean Water and Sanitation) would see significant positive impacts in the short term. These sectors are also identified in the NDCs of Angola²⁰ and the Angola SDG Investor Map.
 - **Integrated financing strategy:** A key corollary of the previous point is the need to significantly increase financing of the NDP priorities aligned to the SDGs. An integrated financing strategy should be adopted to define concrete actions to mobilize more public and private, internal and external resources. Carrying out an initial mapping, based on the parameters of the Medium-Term Fiscal Framework (MTFF) and the Medium-Term Expenditure Framework (MTEF), could help identify existing gaps, as well as the actions needed to increase the scale of the financing. The integrated financing strategy should also address the NDCs' financing.
 - **Data:** The analysis underscored the need to enhance the quality, disaggregation, and frequency of data collection. A lack of statistical information for certain SDG indicators limits the ability to model and simulate progress toward achieving the goals. The iSDG model can be updated at any time, incorporating data from sources such as the Multiple Health Indicator Survey (IIMS) and the Population Census, among others. However, to ensure continuous SDG monitoring, strong coordination among various ministries and relevant departments is essential. Establishing a task force on SDG data, involving all key public and private stakeholders, is highly recommended.



REFERENCES

- Allen, C., Metternicht G., and Wiedmann T. (2016). National pathways to the Sustainable Development Goals (SDGs): a comparative review of scenario modeling tools, *Environmental Science & Policy*, 66, 199-207.
- Barlas, Y. (2007). System dynamics: Systemic feedback modeling for policy analysis. *Systems*, 1, 59.
- (1996). Formal aspects of model validity and validation in system dynamics, *System Dynamics Review*, 12(3), 183-210.
- Government of Angola (2023a). The 2023-2027 National Development Plan.
- (2023b). Angola 2050. Available at: <https://www.mep.gov.ao/publicacoes>
- (2021). Voluntary National Review on the implementation of the 2030 Agenda for Sustainable Development 2021. Available at: https://sustainabledevelopment.un.org/content/documents/286012021_VNR_Report_Angola.pdf
- Homer, J. B. (2012). Partial model testing as a validation tool for system dynamics (1983). *System Dynamics Review*, 28(3), 281-294.
- International Monetary Fund (IMF), 2023. IMF Country Report No. 23/101. Selected issues. Development planning, SDG progress, and fiscal space in Angola.
- Millennium Institute (2018). Millennium Institute: Projects. Available at: <https://www.millennium-institute.org/projects>.
- Pedercini M., and Barney G.O. (2009). Dynamic analysis of interventions designed to achieve Millennium Development Goals (MDG): The case of Ghana, 44(2), 89-99.
- Pedercini M., Zuellich G., Dianati K., and Arquitt S. (2018). Towards achieving Sustainable Development Goals in Ivory Coast: Stimulating pathways to sustainable development, *Sustainable Development*, 26(6), 588-595.
- Sterman, J. (2000). *Business dynamics: Systems thinking and modeling for a complex world*, Irwin/McGraw-Hill.
- System Dynamics Society (2021). What is System Dynamics? Available at: <https://systemdynamics.org/what-is-system-dynamics/>.
- United Nations Development Programme (2024). Human Development Report 2023/2024.
- (2023). SDG Insights Report. Angola.

ANNEXES

A. The iSDG Model

The iSDG Angola Model

The iSDG-Angola Model aims to provide an analytical tool to reinforce the 2023-2027 National Development Plan (NDP) through a systemic and dynamic medium-term model, which integrates a broad set of the country's economic, social and environmental variables. Its scope and level of aggregation make the iSDG model a key tool to support a detailed analysis of different policies and programs included in the NDP (UNEP, 2014; Allen et al., 2016).

Based on the Millennium Institute's Threshold 21 model, iSDG -Angola derives from a long line of models that have been continually developed over the last thirty years as a tool for policy development (Pedercini et al., 2018). These models have been implemented in more than 40 countries around the world and have been used to help develop plans for national development, green economy and sustainable agriculture (Millennium Institute, 2018).

The model was built using the System Dynamics methodology, which focuses on the deconstruction and analysis of complex socioeconomic environments and political systems (Sterman, 2000). Systems Dynamics is a computer-aided approach to designing strategies and policies. The main objective is to help people make better decisions when faced with complex and dynamic systems. The approach provides methods and tools for modeling and analyzing dynamic systems²¹.

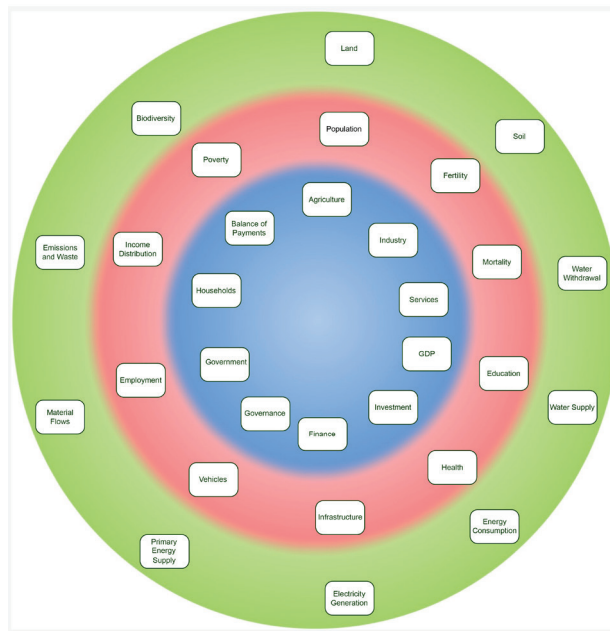
It is important to clarify that the analysis does not provide a prediction, but rather seeks to improve policymakers' understanding of complex intersectoral connections, allowing them to approach the design of public policies with a holistic, complex systems perspective.

The iSDG-Angola Model includes interactive modules related to economic, social and environmental dimensions. Each module can be considered as an individual model, where variables are calculated based on variables from other modules and historical data.

Figure A provides a conceptual overview of the iSDG model structure, which includes 30 modules. Economic activities (blue circle) occur within the social sphere (red circle), from which economic value is generated, within the broader natural environment (green circle), which encompasses natural resources, emissions and waste. All sectors interact dynamically, therefore, a change in one sector leads to impacts over time on all other sectors²².



Figure A. Sectors represented in the iSDG model



Source: Millennium Institute

The connection of modules allows the analysis of dynamic interactions between them. Interactions capture feedback loops, non-linearity and delays, fundamental elements of complex socio-economic-environmental systems that are necessary for understanding development issues. Economic activities occur within a society, from which the social resources extracted can generate economic value, limiting the carrying capacity and resilience of the environment.

The economic modules include economic sectors (agriculture, industry and services), which are characterized by Cobb-Douglas²³ production functions that consider resources, labor, capital and total productivity of endogenous factors. The Government module generates taxes based on economic activity and allocates expenses by categories²⁴.

The Governance module comprises the six indicators of a composite Governance index that affects the productivity and effectiveness of public expenditure. The Households module summarizes household income and disposable income – based on economic activity, subsidies and transfers, remittances, etc. – and is used to support savings and private consumption. In the Investment module, private and public investments are allocated to agriculture, industry and service provision and their disaggregation, if available. The Balance of Payments module encompasses trade, currency, capital operations and accounts. The Finance module comprises capital flows, including public debt management.

The social modules include detailed population dynamics by sex and age groups, from 0 to 99 years and 100 years and over; health and education challenges and programs; basic infrastructure (roads and railways) and vehicles; job; poverty levels and income distribution. The modules consider, for example, the interactions between income, health, nutrition and adult literacy rates and the effect this interaction has on fertility and life expectancy, which in turn determine population growth.

Population determines the workforce over time, which shapes employment in addition to education and capital

levels. Furthermore, employment, education and savings levels affect income distribution and, consequently, poverty. Education and health, along with other factors, influence labor productivity and life expectancy. Similarly, infrastructure and vehicles impact productivity, but at the same time cause demand and emissions for fossil fuels, affecting health levels.

Environmental modules summarize the consumption of natural resources – renewable and non-renewable – and estimate the impact of the use and depletion of these resources on production, health and other modules. They cover changes in land use (e.g. from forest to agriculture or urban territory) in resource stocks, e.g. fish and forest cover; on soil quality based on its nutrient levels; and evaluate their impacts on other modules, such as agricultural productivity, nutrition and biodiversity²⁵.

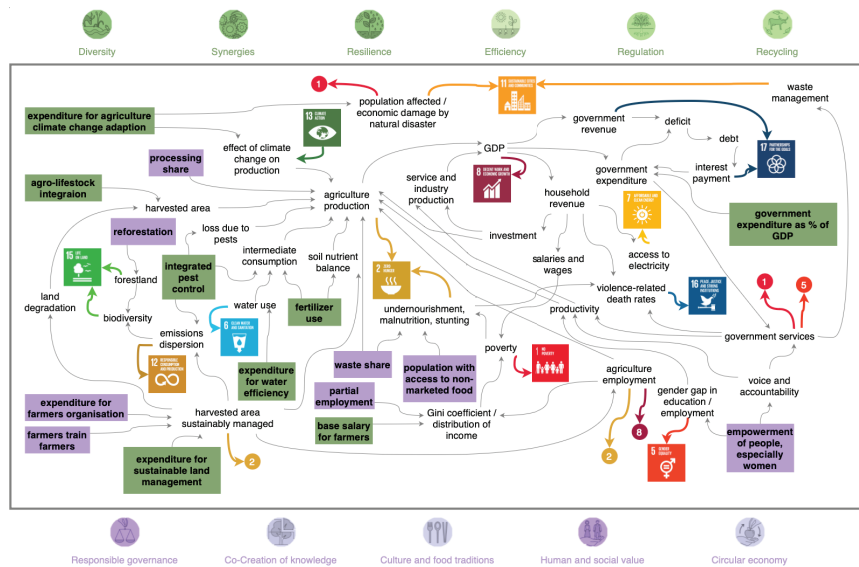
We strive to maintain consistency by using identical values from the 2023 Sustainable Development Report whenever possible. In cases where this was not possible, we meticulously replicated the methodology, based on data from the global SDG database. Supplementary data was obtained from several reliable sources, including FAOSTAT, the Global Material Flows Database, UNESCO and the World Development Indicators.

The System Dynamics methodology uses feedback-based simulation models that complement systems thinking approaches. This allows us to understand the behavior of complex systems over time, considering the existence of internal feedback loops – which can reinforce or weaken some processes – as well as delays that affect the behavior of the system as a whole. Analyzing complex and dynamic systems is crucial to be able to capture the interaction between hundreds of variables that influence development, moving away from the linear logic by which a policy intervention affects a certain variable and leads to a single result.

A causal loop diagram is a method used to understand and analyze complex systems. It helps visualize how different key variables in a system are causally interrelated. The diagram consists of a set of words and arrows, including a narrative that describes the causally closed situation that the diagram describes.

Feedback loops are cause-and-effect relationships that directly impact system dynamics, that is, they are a sequence of variables that are interconnected in a cycle. Reinforcing feedback has a positive polarity and is responsible for reinforcing or expanding the initial action of the system. On the other hand, equilibrium feedback tends to oppose the initial action seeking to stabilize complex systems.

Figure B. Example of a feedback loop diagram



Source: Millennium Institute

Calibration and Validation

The iSDG-Angola Model has undergone extensive structural and behavioral validation exercises, both as part of this project and in previous model implementations (Barlas, 1996). The model structure was validated through reviews carried out by the modeling team.¹

The iSDG-Angola is the customized version for the Angolan context²⁶, through a specific calibration process, relying on historical data from 2003 to the present. Calibration was performed using partial calibration cycles (Homer, 2012), also including multi-parametric optimization²⁷. Calibration of some modules, such as population, fertility and mortality, is mainly based on absolute values.

In contrast, the calibration of other modules – such as agriculture, industry and services – considers the growth patterns of various elements of the structure, in relation to themselves and also to other elements. One of the different tests carried out to validate the model results was the comparison with the simulation results with real historical data²⁸.

To develop the iSDG-Angola Model, two teams were formed:

- Technical team: MINPLAN, MINFIN, INE, UNDP and Millennium Institute.
- Consultation group: MINPLAN, MINFIN, INE, the Study, Planning and Statistics Offices of all Ministries, United Nations System in Angola (UNDP, UNICEF, WHO, UNHCR, UNFPA and UN Resident Coordinator Office) and Millennium Institute.

Data was collected from international and national data sources. National data sources were prioritized, with international data filling gaps where national data were not available or did not exist for specific indicators. Data collection and analysis occurred in close coordination with technical experts from MINPLAN, MINFIN, INE, UNDP and external experts when existing data was insufficient.

All historical data, parameters and assumptions were discussed and finally confirmed by partners from the institutions involved. In some cases, available historical data has been adjusted to better reflect reality.

Although best efforts have been made to replicate all historical data, in some cases the data sources are not entirely consistent, in part because several data sources are used to cover a long period. As a consequence, some changes are occasionally necessary to ensure that the overall model simulates reality as best as possible.²⁹

Definition of Analyzed Interventions

The interventions tested in the iSDG-Angola Model were defined based on:

- Long Term Strategy, Angola 2050
- National Development Plan (NDP) 2023-2027
- Relevant national plans and strategies
- iSDG model initial workshop, held in 2022

- iSDG model technical workshops, held between 2022 and 2023
- iSDG model validation workshop, held in March 2024

How Performance is Calculated

The global framework of SDG indicators adopted by the United Nations Statistical Commission brings together 169 targets and 247 indicators, of which 231 are unique indicators³⁰, to monitor countries' progress until 2030.

To analyze the iSDG-Angola Model, a set of SDG indicators was selected based on the following criteria:

- Indicators reported by Angola in the 2021 Voluntary National Review;
- Indicators of a quantitative nature;
- Indicators that the country can influence through the 2023-2027 NDP³¹. Therefore, the iSDG-Angola model performs simulations on 59 unique SDG indicators (see Annex G)³².

For each indicator, the performance of interventions is defined in terms of progress toward achieving the SDGs linked to that intervention. Each SDG consists of a series of indicators with a target value agreed by the international or national community. The model compares the value of each indicator in 2030, in each scenario, with the value in 2015, the base year measurement. The model then calculates the ratio of this difference to that between the target values and the values in 2015.

$$\frac{\text{Value } 2030i - \text{Value } 2015}{\text{Goal-Value } 2015}$$

Where i represents a scenario.

For this reason, the impact of a policy intervention is assessed based on the distance between these values and the corresponding target values. For some indicators, targets are absolute (for example, for indicator 1.1, the target is to reach 0, so performance has improved as this indicator approaches zero), while others are set about meeting the value to the 2015 value; for example, for indicator 8.6.1, the target is to halve the youth unemployment rate compared to the 2015 level.

The achievement of the SDGs is calculated from 0 to 100 percent, where 100 percent corresponds to the full realization of a Goal. The realization of the SDG targets are weighted equally when calculating levels of achievement of indicators. The levels of compliance with the indicators, in turn, are weighted equally when calculating the levels of compliance with the SDGs.

Finally, all SDGs are weighted equally in calculating the overall attainment of the 59 SDG indicators considered in the model. It is worth noting that not all 169 goals defined in the 2030 Agenda are present in the model due to some being qualitative or the lack of a concrete definition of indicators³³.

Scenarios

To provide a reference for comparing the effects of the 2023-2027 NDP interventions, a base scenario - called business as usual - was first developed. This scenario presupposes a change in policies, maintaining historical growth trends and government and private sector investment levels indexed to GDP, without extreme changes.

The 2023–2027 NDP contains interventions in the areas of education, health, food security, environment, and energy, among others. The NDP targets and the SDG targets are compared with the Business as Usual scenario both individually and together in the first analysis component to assess their effect.

To investigate possible SDG accelerators, it is necessary to consider different scenarios that will affect the implementation of interventions and their effects. The scenarios describe the possible evolutions of some variables considered important for the development of Angola.

Based on consultations with different government entities, three variables were identified that could strongly influence changes in Angola’s future: Oil Prices, Oil Production and Governance. For these three variables, three possible scenarios are considered: reference, positive and adverse (Table 5).

On a positive trajectory, it is assumed that the average oil price will increase 45 percent above the projections of the World Energy Outlook (WEO) until 2030. Similarly, oil production will increase by 20 percent by 2030 compared to 2021 production. Governance is also expected to improve by 40 percent. In an adverse scenario, the three variables mentioned above will have a negative evolution.

Additional investment levels as a percentage of GDP to achieve SDG targets are also defined under the premise of development in two scenarios: Positive and Adverse.

- Oil Price: In the Positive scenario, an increase of 45 percent is assumed by 2030 compared to the projections World Energy Outlook (WEO) of US\$89.5 per barrel. In the Adverse context, a 27 percent price reduction is considered compared to the same projection.
- Oil Production: In the Positive scenario, an increase in production by 20 percent is assumed compared to the reference value in 2021 (1.20 million barrels per year). Conversely, in the Adverse scenario, a 20 percent reduction in production is considered compared to the same value.
- Governance: the model uses the World Bank’s Worldwide Governance Indicators (WGIs). The WGIs are assumed by 40 percent compared to the reference value (Table A). In the Adverse scenario, a 40 percent worsening of the same value is considered.

Table A. Scenarios analyzed in the iSDG-Angola Model (values in 2030)

Indicators/ Scenarios	Reference	Positive	Adverse	Unit of measurement
National oil production (annual average)	1,20	1,44	0,97	Million barrels per day
Oil price (annual av- erage)	89,5	130,0	65,0	US\$ per barrel
WGI Governance Index ^a	0,32	0,192	0,448	Adimensional

Note: a) The Worldwide Governance Indicators (WGIs) feature six aggregate governance indicators for over 200 countries and territories over the period 1996–2022. The WGI Governance Index averages those six key governance indicators: Control of Corruption, Government Effectiveness, Political Stability and Absence of Violence/Terrorism, Regulatory Quality, Rule of Law, and Voice and Accountability. Indicators are normalized to a common scale using the formula $(X+2.5)/6$, transforming values from -2.5 to +2.5 into a range from 0 to 1. Normalized indicators are then averaged to yield the overall governance index. This method provides a single index reflecting the comprehensive measure of governance quality. The reference value of 0.32 was calculated using 2018 as the base year. See also: Kaufmann, D., Kraay, A. (2002). Governance Matters II, Updated Indicators for 2000/01. Policy Research Working Paper, (2772). Washington, DC: World Bank.

A baseline scenario is also analyzed, where no additional investments are made and none of the three scenarios are considered. This scenario is used to have a baseline to compare different model simulations with an initial simulation.

B. Limitations

A Systems Dynamics model has intrinsic limitations that must be considered when evaluating its results. Some important points to consider are:

1. Forecast vs. simulation: The iSDG model should be used as a decision-making support tool. Its greatest utility is related to the ability to demonstrate system connections and quantify proposed interventions. However, the results of the simulations should not be considered predictions of the future, but rather be taken as a basis for decision-making based on data and scientific basis.
2. Model structure: A System Dynamics model is intended to help understand the connections of a complex system, just as a map of a territory is used to aid navigation. In this way, it is impossible to completely represent the entire system of a country, just as it is impossible to have a map with the same level of detail as a real terrain.
3. Validation: Validation of a Systems Dynamics model is complex due to the philosophical and technical way in which it is developed (Barlas, 2007). However, the causalities assumed in a model require a scientific basis to be recognized. The Millennium Institute uses recent research to build the iSDG model and adapt it to each country.
4. Data: The quality and consistency of databases are extremely important to increase confidence in a System Dynamics model. However, it is common to use extrapolation and interpolation methods to fill data gaps, which can reduce the quality of the results. The Millennium Institute works with internationally recognized data sources so that the best available data is used. Furthermore, the limitation of statistical information on SDG indicators and targets (see Figure 3) prevents a broad and in-depth simulation of the trajectory towards achieving the SDGs.
5. Aggregation level: To simplify understanding the connections and impacts of interventions in a system, an iSDG model aggregates data at the national level, limiting its use to provincial and municipal levels.

C. Data Sources

This section summarizes the data sources and highlights the main assumptions considered in the iSDG-Angola Model. The primary sources of data are summarized in the table below.

Table B. Primary data sources used in the iSDG-Angola Model

Module	Source
1. Population	World Population Prospects 2019 Revision
2. Fertility	WDI - World Development Indicators
	World Population Prospects 2019 Revision
3. Mortality	World Population Prospects 2019 Revision
	World Development Indicators
	EMDAT - The international disasters database
	WHO – World Health Organization
4. Education	WDI - World Development Indicators
	Barro Lee
5. Health	WDI - World Development Indicators
6. Road Infrastructure	Ministério dos Transportes de Angola
	WDI - World Development Indicators
	CIA - Central Intelligence Agency
	EMDAT - The international disasters database
7. Vehicles	OICA - International Organization of Motor Vehicle Manufacturers
8. Employment	ILO - International Labour Organization
	FAO - Food and Agriculture Organization of the United Nations
	National Institute of Statistics (INE) of Angola
	WDI - World Development Indicators
9. Income Distribution	WDI - World Development Indicators
10. Poverty	WDI - World Development Indicators
	UNDP - United Nations Development Programme:
11. Agriculture	WDI - World Development Indicators
	FAO - Food and Agriculture Organization of the United Nations
	INE Angola – Instituto Nacional de Estatística
	UNSD
12. Industry	WDI - World Development Indicators

Module	Source
13. Services	WDI - World Development Indicators
	IMF – International Monetary fund
14. GDP	WDI - World Development Indicators
15. Investment	Government of Angola General State Accounts
16. Households	WDI - World Development Indicators
17. Government	WDI - World Development Indicators
	IMF – International Monetary fund
18. Governance	WDI - World Development Indicators
	World Bank
19. Finance	IMF – International Monetary fund
	WDI - World Development Indicators
	Governo de Angola
20. Balance of Payments	WDI - World Development Indicators
21. Territory	FAO - Food and Agriculture Organization of the United Nations
22. Soil	FAO - Food and Agriculture Organization of the United Nations
23. Water Withdrawal	FAO - Food and Agriculture Organization of the United Nations
24. Water Supply	FAO - Food and Agriculture Organization of the United Nations
	WDI - World Development Indicators
25. Energy Consumption	EIA - International Energy Agency
	WDI - World Development Indicators
26. Electricity Generation	EIA - International Energy Agency
	UNSD - United Nations Statistics Division
27. Primary Energy Supply	WDI - World Development Indicators
28. Material Consumption	UNSTATS – United Nations Statistics
	WDI - World Development Indicators
29. Emissions and Waste	WDI - World Development Indicators
	FAO - Food and Agriculture Organization of the United Nations
	What A Waste Global Database
	Climate Knowledge Portal
30. Biodiversity	UNSTATS – United Nations Statistics
	WDI - World Development Indicators
	Searoundus.org



D. Identification of SDG accelerators

SDG accelerators are leverage points where improvement in one area can trigger progress in several SDG indicators. Accelerators can become priority areas for development or areas that are lagging.

After potential leverage points are identified, investment scenarios are defined based on the investment domains considered in the model (Table 1); then, interventions are tested in the iSDG-Angola Model to verify their potential effect on SDG performance.

Various analysis methods are used to identify SDG accelerators through their impact on performance. A combination of results from these methods informs accelerator selection. These analysis methods are structured around three questions:

1. Which areas experience the greatest performance relative to the investment required?

For those scenarios that have associated costs in the iSDG model, performance can be calculated about their cost. Some interventions are relatively less expensive than others and, due to their cost of implementation, can offer good returns for relatively lower levels of investment, even if the overall performance is not as high as in the case of other interventions.

Furthermore, return on investment patterns may vary in the case of non-linear returns. For example, in the case of health coverage, it is typically more expensive to go from 95 percent to 100 percent coverage rather than from 50 percent to 55 percent, as they are more likely to be in hard-to-reach areas.

The calculation of return on investment is made by dividing the improvement, or decline, in performance of the base performance by the average annual percentage of GDP expenses for implementing this scenario:

$$\text{Return on Investment} = \frac{\text{Performance } i,j - \text{Performance base } j}{\text{percent of GDP invested } i}$$

Where *i* represents a specific scenario and *j* represents a specific SDG.

2. Which SDGs have the greatest synergistic return?

Combining the individual performance of each scenario and comparing the individual scenarios with the scenario that combines all interventions, the “All” scenario was created, and the interaction between the scenarios can be analyzed. This method is used to identify cost-effective SDG strategies and possible redundancies.

Contributions are calculated based on the performance of each scenario versus the performance of the scenario that includes all interventions (“All” scenario). This value represents the relative performance of the scenario about the performance of the scenario that combines all interventions.

$$\text{Contribution } ij = \text{Individual Performance Scenario } i,j - \text{Performance Base } j$$

Where *i* represents a specific scenario and *j* represents a specific SDG.

Synergies between scenarios (interventions) for each indicator are specified as one minus the linear sum of the contributions of all individual scenarios. If it is positive (contributions add up to more than 1), this value represents a situation where, implementing all scenarios together, the contribution to performance is stronger. If it is negative (contributions add up to less than 1), it represents redundancy, i.e. the performance of the individual scenarios is stronger than that of the combined scenario, including all interventions.

This redundancy can arise for three possible reasons. First, the return on investment in that specific objective may decline as better performance is achieved. Second, there may be negative effects between certain scenarios. Finally, this redundancy can also occur if goals are achieved, for example reaching 100 percent.

$$\text{Synergy } ij = \text{Individual Performance } ij - (\text{Total Performance } j - \text{Elimination Performance } ij)$$

By knowing which SDGs have the greatest increase in performance through the interaction of different scenarios, interventions targeting these SDGs can be further studied.

3. What interventions are most vital to support other areas towards achieving the SDGs?

Although an intervention may present unsatisfactory results when implemented individually, this same intervention may prove to be important when implemented in conjunction with other interventions. However, an intervention may negatively influence one or more areas when tested simultaneously with other interventions. This is due to the dynamic and systemic nature of the iSDG model. In support of this point, a second synergy study can be carried out using an elimination analysis, calculating the effects if an intervention were excluded.

E. Cost of the interventions

In this section a justification of the process is presented; then, the projects of the Medium-Term Fiscal Framework (MTFF) and the Medium-Term Expenditure Framework (MTEF) are illustrated by category, including the correspondent interventions simulated in the Angola's iSDG model, and any other assumptions related to the costs

The MTEF is a financial programming instrument that allows the Government to expand the horizon of budgetary policy beyond the annual calendar, relating medium-term development policies, national planning and the budget. The instrument is supported by the Public Finance Sustainability, which obliges the sovereign bodies and, Central and Local Administration of the State to prepare the document by June 30th of each year.

Cost estimates are derived primarily from MTFF and MTEF documents and other sources, as described below. Although costs for 2023-2027 NDP programs are available, many of these programs are cross-sectoral and many interventions span multiple programs.

For example, the agro-industry program includes not only investments in agriculture and industry but also in road infrastructure. This is in addition to the Mineral Development, Sustainable Development of Petroleum Resources, Private Sector Development, Manufacturing, Urbanization and Sustainable Housing programs, and, of course, Infrastructure and Integrated Transport Services programs that also mention increased investment in paved roads.

Although these are most often linked to specific projects, repercussions for other areas outside the change intended by the programs must also be measured. Therefore, this analysis recategorizes projects within these programs by intervention. As individual project costs for these programs are not available, it was not possible to map these costs directly to the programs. Therefore, results are presented by intervention category, with additional interpretation of programs in the results section.

The cost estimation process begins with calculating the unit cost of policies, which is derived from multiple data sources. These data sources may include national statistics, regional economic reports, or international

databases. If country-specific data is not available, a reference unit cost is used, based on the region of the country or an average for similar countries.

The benchmark unit cost serves as a baseline, providing a standard measure for comparison between different locations. It can be denominated in local currency or U.S. dollar in purchasing power parity (PPP). In cases where the reference unit cost is in U.S. dollar, a local currency converter is used to adjust the cost based on the deflator and exchange rate, ensuring accuracy and relevance to the local context.

Once the base unit cost has been established, the next step involves projecting the expected unit cost for 2030. This projection is achieved through optimization techniques within the model, taking into account various factors such as inflation, economic growth, technological advances and policies. changes. The optimization process calibrates the expected unit cost based on the reference unit price, ensuring that the estimate is aligned with projected future conditions and requirements.

By employing this comprehensive approach, the cost estimation model provides a robust framework for forecasting policy costs, incorporating both current data and future projections.

Table C. Cost estimates used in the simulation

Area	Domain	Intervention	Unit cost	Unit
Human capital	1. Health	Health	3 946	Kz/capita
		Family planning	83	Kz/capita
	2. Education	Education	Primary 1,600	Kz/capita
			Secondary 3,000	
			Tertiary 33,000	
	3. Water and Sanitation	Water management	1 584	Kz/capita
Basic sanitation			1 553	Kz/capita
4. Social Protection	Income transfers			
Productive Sectors	5. Environment and Climate Action	Adaptation to climate change		
		Environmental protection	4 190	Kz/km2
		Marine protection	58 200	Kz/km2
		Reforestation and afforestation	15 500	Kz/km2
	6. Agriculture	Livestock		
		Fisheries		
		Subsidies to fertilizers	Nitrogen 1,574	US\$/ton
			Phosphorus 3,000	
			Potassium 33,000	
		Capacity building on sustainable agriculture	776	Kz/capita
	Irrigation	1 800	US\$/ha	
	7. Manufacturing Industry	Manufacturing		
	8. Energy	Solar and hydroelectric energy	33	Kz/kW
9. Road infrastructure	Road paving	2 257 981	US\$/km	

Notes: ha=hectare; km=kilometre; km2=square kilometre; kW= Kilowatt; Kz=Kwanza; USD=United States dollar.

F. Additional results

The table below presents the results of simulations of achieving the SDG targets under the three different scenarios tested in the iSDG model (Positive, Reference and Adverse), as well as considering the different investment scenarios: baseline (based on the 2024 national budget), additional 2 percent of annual GDP and additional 5 percent of annual GDP. The results from the “Reference” column are also presented in Figure 7.

Table D. Estimated achievement of the SDGs by Goal (% of achievement by 2030)

Scenarios (right) and SDGs (below)	Positive			Reference			Adverse		
	Baseline invest.	Additional invest. of 2% of GDP	Additional invest. of 5% of GDP	Baseline invest.	Additional invest. of 2% of GDP	Additional invest. of 5% of GDP	Baseline invest.	Additional invest. of 2% of GDP	Additional invest. of 5% of GDP
ODS 1	46%	72%	73%	45%	66%	68%	43%	63%	64%
ODS 2	6%	70%	70%	6%	70%	70%	6%	69%	69%
ODS 3	46%	47%	49%	45%	45%	47%	43%	44%	46%
ODS 4	57%	60%	61%	56%	59%	60%	54%	59%	59%
ODS 5	63%	87%	87%	62%	87%	87%	59%	87%	87%
ODS 6	51%	71%	87%	45%	61%	80%	42%	56%	74%
ODS 7	79%	83%	91%	75%	79%	89%	71%	75%	85%
ODS 8	32%	33%	34%	26%	27%	28%	19%	20%	21%
ODS 9	60%	61%	62%	59%	59%	60%	56%	57%	58%
ODS 10	33%	33%	35%	33%	33%	35%	33%	33%	34%
ODS 11	76%	77%	78%	75%	76%	77%	74%	75%	75%
ODS 12	41%	38%	38%	42%	40%	40%	43%	42%	42%
ODS 13	83%	83%	87%	83%	83%	87%	83%	83%	87%
ODS 14	<1%	<1%	30%	<1%	<1%	22%	<1%	<1%	15%
ODS 15	62%	60%	89%	62%	61%	83%	63%	62%	77%
ODS 16	59%	56%	56%	56%	53%	53%	51%	48%	48%
ODS 17	41%	49%	50%	22%	32%	34%	20%	21%	22%

Source: iSDG-Angola Model.




Table E. Estimated achievement of the SDGs (% of achievement by 2030)

Scenario	Baseline investment ^a	Additional investment of 2 percent of GDP	Additional investment of 5 percent of GDP
Positive	49%	58%	63%
Reference	47%	55%	60%
Adverse	45%	53%	57%

Source: Own elaboration based on the iSDG model. Notes: a) Investment foreseen in the 2024 Budget Law

G. Selected SDG indicators used in the model







Table F. Selected SDG indicators used in the Angola iSDG Model

SDGs	SDG indicators
 <p>1 NO POVERTY</p>	1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)
	1.2.1 Proportion of population living below the national poverty line, by sex and age
	1.4.1 Proportion of population living in households with access to basic services
	1.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
	1.5.2 Direct economic loss attributed to disasters in relation to global gross domestic product (GDP)*
 <p>2 ZERO HUNGER</p>	2.1.1 Prevalence of undernourishment
	2.2.1 Prevalence of stunting (height for age <-2 standard deviation from the median of the World Health Organization (WHO) Child Growth Standards) among children under 5 years of age
	2.2.2 Prevalence of malnutrition (weight for height >+2 or <-2 standard deviation from the median of the WHO Child Growth Standards) among children under 5 years of age, by type (wasting and overweight)
	2.3.1 Volume of production per labour unit by classes of farming/pastoral/forestry enterprise size
	2.4.1 Proportion of agricultural area under productive and sustainable agriculture
 <p>3 GOOD HEALTH AND WELL-BEING</p>	3.1.1 Maternal mortality ratio
	3.1.2 Proportion of births attended by skilled health personnel
	3.2.1 Under 5 mortality rate
	3.2.2 Neonatal mortality rate
	3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease
	3.6.1 Death rate due to road traffic injuries
	3.7.1 Proportion of women of reproductive age (aged 15–49 years) who have their need for family planning satisfied with modern methods
	3.7.2 Adolescent birth rate (aged 10–14 years; aged 15–19 years) per 1,000 women in that age group
	3.8.1 Coverage of essential health services
 <p>4 QUALITY EDUCATION</p>	4.1.1 Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex
	4.3.1 Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex
	4.5.1 Parity indices (female/male, rural/urban, bottom/top wealth quintile and others such as disability status, indigenous peoples and conflict-affected, as data become available) for all education indicators on this list that can be disaggregated
	4.6.1 Proportion of population in a given age group achieving at least a fixed level of proficiency in functional (a) literacy and (b) numeracy skills, by sex



SDGs	SDG indicators
5 GENDER EQUALITY 	5.5.2 Proportion of women in managerial positions
	5.6.1 Proportion of women aged 15–49 years who make their own informed decisions regarding sexual relations, contraceptive use and reproductive health care
6 CLEAN WATER AND SANITATION 	6.1.1 Proportion of population using safely managed drinking water services
	6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water
	6.4.1 Change in water-use efficiency over time
	6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources
7 AFFORDABLE AND CLEAN ENERGY 	7.1.1 Proportion of population with access to electricity
	7.2.1 Renewable energy share in the total final energy consumption
	7.3.1 Energy intensity measured in terms of primary energy and GDP
8 DECENT WORK AND ECONOMIC GROWTH 	8.1.1 Annual growth rate of real GDP per capita
	8.2.1 Annual growth rate of real GDP per employed person
	8.4.1 Material footprint, material footprint per capita, and material footprint per GDP*
	8.4.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP
	8.5.2 Unemployment rate, by sex, age and persons with disabilities
	8.6.1 Proportion of youth (aged 15–24 years) not in education, employment or training
9 INDUSTRY, INNOVATION AND INFRASTRUCTURE 	9.1.1 Proportion of the rural population who live within 2 km of an all-season road
	9.2.1 Manufacturing value added as a proportion of GDP and per capita
	9.2.2 Manufacturing employment as a proportion of total employment
	9.4.1 CO2 emission per unit of value added
10 REDUCED INEQUALITIES 	10.1.1 Growth rates of household expenditure or income per capita among the bottom 40 percent of the population and the total population
	10.2.1 Proportion of people living below 50 percent of median income, by sex, age and persons with disabilities
	10.4.1 Labour share of GDP
11 SUSTAINABLE CITIES AND COMMUNITIES 	11.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population
	11.5.2 Direct economic loss in relation to global GDP, damage to critical infrastructure and number of disruptions to basic services, attributed to disasters*
	11.6.1 Proportion of municipal solid waste collected and managed in controlled facilities out of total municipal waste generated, by cities
	11.6.2 Annual mean levels of fine particulate matter (e.g., PM2.5 and PM10) in cities (population weighted)



SDGs	SDG indicators
	12.2.1 Material footprint, material footprint per capita, and material footprint per GDP
	12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP
	13.1.2 Number of countries that adopt and implement national disaster risk reduction strategies in line with the Sendai Framework for Disaster Risk Reduction 2015–2030*
	13.2.2 Total greenhouse gas emissions per year
	14.4.1 Proportion of fish stocks within biologically sustainable levels
	14.5.1 Coverage of protected areas in relation to marine areas
	15.1.2 Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type
	15.5.1 Red List Index
	16.1.1 Number of victims of intentional homicide per 100,000 population, by sex and age
	16.6.2 Proportion of population satisfied with their last experience of public services
	17.1.1 Total government revenue as a proportion of GDP, by source
	17.1.2 Proportion of domestic budget funded by domestic taxes
	17.3.1 Foreign direct investment, official development assistance and South-South cooperation as a proportion of gross national income
	17.4.1 Debt service as a proportion of exports of goods and services

Note: *) The global indicator framework includes 231 unique SDG indicators; however, thirteen indicators repeat under two or three different targets. There are four SDG indicators considered in the Angola iSDG Model that are repeated; they are marked with the symbol *. See also: <https://unstats.un.org/sdgs/indicators/indicators-list/>



NOTES

1. United Nations, 2023. The Sustainable Development Goals Report 2023: Special edition. Towards a Rescue Plan for People and the Planet. Available at: <https://unstats.un.org/sdgs/report/2023/>
2. United Nations, Inter-agency Task Force on Financing for Development, 2024. Financing for Sustainable Development Report 2024: Financing for Development at a Crossroads.
3. The sustainable financing gap for 48 developing countries by 2030 is estimated at between USD5.4 billion and USD6.4 billion per year. Source: UNCTAD, 2023. The costs of achieving the SDGs. Available at: <https://unctad.org/sdg-costing>.
4. United Nations Secretary-General's SDG Stimulus to Deliver Agenda 2030. February 2023.
5. The term investment is used to refer to public expenditure budgeted in the 2024 National Budget. The definition includes both current expenditure and capital expenditure.
6. In 2023, the oil sector contributed around 60 percent of the country's tax revenues. Source: Ministry of Finance, National Budget 2024, Foundation Report.
7. The Reference scenario assumes that oil price and production trends, as well as governance indicators, remain similar to 2023 values.
8. United Nations, Inter-agency Task Force on Financing for Development, 2024. Financing for Sustainable Development Report 2024: Financing for Development at a Crossroads.
9. International Monetary Fund (IMF), 2023. IMF Country Report No. 23/101. Selected issues. Development planning, SDG progress, and fiscal space in Angola.
10. The initiative presents three areas for immediate action: i) addressing the high cost of debt and increasing risks of debt distress, including through the conversion of short-term high-interest loans into long-term debt (over 30 years) at lower interest rates; ii) massively increase affordable long-term financing for development, especially through public development banks, including multilateral development banks, and by aligning all financing flows with the SDGs; and iii) expand contingency financing to countries in need.
11. Integrated National Financing Framework (INFF). Note: the same SDG Stimulus commitment was reinforced in the Political Declaration of the 2023 SDG Summit, approved by UN General Assembly resolution A/RES/78/1.
12. Government of Angola. Long-Term Strategy, Angola 2050. Note: The 2023-2027 NDP does not indicate the volume of financing required.
13. The values refer to adaptation and mitigation actions in a non-conditional way, that is, relying only on available resources, without considering international support.
14. To cover these needs, the 2024 National Budget Law foresees the raising of financial resources in the domestic markets (5.2 percent of GDP), using the usual Treasury debt instruments, including loan contracts, as well as using the external market (8.4 percent of GDP) and with partner financial institutions, multilateral and bilateral. The revenues provided for in the Privatization Program (PROPRIV) are also a source of financing for these needs.
15. International Monetary Fund (IMF), 2024. World Economic Outlook, April 2024. Gross domestic product, current prices in U.S. dollars.
16. Domestic resource mobilization is a process through which the State raises and spends its funds to provide for the population. It does not necessarily mean new taxes or higher tax rates.
17. Domestic tax base erosion and profit shifting (BEPS).
18. Law 37/20.
19. Internationally Transferable Mitigation Outcome (ITMO).
20. Angola's NDCs mitigation actions for 2020-2025 comprise four sectors: i) Energy, ii) Agriculture, Forestry and Other Land Uses



- (AFOLU), iii) Industry and iv) Waste. The country's NDCs adaptation actions comprise six sectors: i) Agriculture and Fisheries, ii) Coastal Zone, iii) Forest, Ecosystem and Biodiversity, iv) Water Resources, v) Human Health and vi) Infrastructure.
21. The methodology uses feedback-based simulation models that complement systems thinking approaches (System Dynamics Society, 2021).
 22. This feedback-rich structure endogenously determines the model's behavior, as economic, social and environmental indicators respond to the accumulation or deterioration of resources over time.
 23. The Cobb-Douglas is a function widely used in economics to represent the relationship between two (or more) factors of production and the product.
 24. Public expenditure impacts the provision of public services. The categories of the national budget are incorporated into the model.
 25. Other issues addressed are the demand and supply of fossil fuels, electricity and water, with their impacts on various factors such as productivity, access to electricity affecting education, access to water and sanitation facilities affecting health levels and emissions. Population and production levels determine the demand for these natural resources and the generation of waste and air pollution (e.g., greenhouse gases), but investment decisions can influence the level of waste treatment and efficiency, in addition to the capacity to use renewable energy.
 26. Calibration is the process of estimating model parameters to obtain a correspondence between model results and historical data.
 27. The optimization process that includes different parameters at the same time.
 28. If the model reproduces historical data well and for the right reasons, it creates the degree of confidence necessary to make future projections. These comparisons showed satisfactory results for the main indicators.
 29. A limitation of this approach is that it can potentially change the results if different sets of assumptions are made. The main limitations of the iSDG-Angola Model are described in the Annex.
 30. There are SDG indicators repeated in more than one Goal. The full list of SDG indicators, including those repeated, is available here: <https://unstats.un.org/sdgs/indicators/indicators-list/>
 31. Among the 247 SDG indicators, there are some of a qualitative or multilateral nature that the iSDG-Angola Model is unable to incorporate. For example, indicator 13.1.2 refers to "the number of countries adopting and implementing national disaster risk reduction strategies in line with the 2015-2030 Sendai Framework for Disaster Risk Reduction"; a quantitative simulation on this type of indicator is not applicable.
 32. The indicators and their respective targets are presented in section 3.2 together with their respective SDGs and results.
 33. Target achievement is expressed in absolute terms in this report, not in relative terms. So, for example, when performance increases from 10.0 percent to 16.5 percent, performance is 6.5 percent higher.

