

GLOBAL INFORMATION SOCIETY WATCH 2020

*Technology, the environment and
a sustainable world: Responses from
the global South*



ASSOCIATION FOR PROGRESSIVE COMMUNICATIONS (APC)
AND SWEDISH INTERNATIONAL DEVELOPMENT COOPERATION AGENCY (SIDA)

Global Information Society Watch 2020

Technology, the environment and a sustainable world: Responses from the global South

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Introduction

The Southern African Development Community (SADC) has experienced significant socioeconomic growth averaging 5.1% per year over the past decade.¹ However, this growth has not been even across the member states. The majority of the member states continue to grapple with myriad challenges, including high levels of unemployment, persistent poverty, consequences of climate change, and political instability.²

While examining the possible solutions to curtail these challenges, the need to employ a new planning paradigm based on a green economy (GE) approach complemented by information and communications technology (ICT) models has become clear.³ Prior studies demonstrate that a GE driven by ICTs could foster economic diversification, the creation of employment, access to basic services, environmental protection and reduced inequality and poverty, and ensure socioeconomic growth across the world.⁴ Furthermore, a GE could help to drive gross domestic product (GDP) and jobs through shifting investments towards clean technologies, natural capital, human resources and social institutions. Despite the evidence of such benefits, literature on the role of ICTs in fostering a GE in the SADC region is limited and ultimately dispersed. This has led to lack of evidence-based research data to inform policy direction in the region and beyond.

The purpose of this report is mainly to document the state of a GE in SADC; establish how ICTs

influence GE development in the region; identify some GE initiatives in SADC; and finally offer recommendations for policy and research. The report is based on a review of literature relevant to selected SADC member states. The report does not aim to paint a comprehensive picture of the GE in the region, but it nevertheless points to general trends.

Study context

Established in 1992, the SADC is a regional economic community comprising 15 member states covering 554,919 square kilometres with a population of over 227 million.⁵ The member state countries are Malawi, Tanzania, Zambia, Zimbabwe, Botswana, the Democratic Republic of Congo (DRC), Namibia, Angola, Mozambique, Eswatini, Lesotho, South Africa, Mauritius, Madagascar and Seychelles. Its secretariat is based in Gaborone, Botswana. Five countries have a total coastal line, six countries are landlocked, and three are Indian Ocean island states.

The main objectives of the SADC are to:

- Achieve development, peace and security, and economic growth.
- Alleviate poverty.
- Enhance the standard and quality of life of the peoples of Southern Africa.
- Support the socially disadvantaged through regional integration, built on democratic principles and equitable and sustainable development.⁶

To achieve this, the SADC Secretariat is the principal executive institution responsible for strategic planning, facilitation and coordination, and management of SADC programmes, all of which are aimed at achieving the objectives of the SADC.⁷ GDP growth is estimated at 5.1% on average across all 15 member states. The service, industry and agriculture sectors of the economy contribute to approximately 51%, 32% and 17% respectively. The projections are for a steady but increasing growth rate of 5% to 8% up to 2025. However, even as this growth is anticipated, the region continues to face a number of challenges such as water, energy and

1 Southern African Development Community. (2015). *Green Economy Strategy and Action Plan for Sustainable Development*. https://www.sadc.int/files/4515/9126/1250/SADC_Green_Economy_Strategy_and_Action_Plan-English.pdf

2 Ibid.

3 Southern African Development Community. (2017). *Action Plan for SADC Industrialization Strategy and Roadmap*. https://www.sadc.int/files/4514/9580/8179/Action_Plan_for_SADC_Industrialization_Strategy_and_Roadmap.pdf

4 Swedish International Development Cooperation Agency. (2017). *Green Economy – Why, What and How?* <https://www.sida.se/globalassets/sida/eng/partners/green-tool-box/green-economy-why-what-and-how.pdf>

5 <https://www.sadc.int/about-sadc/overview>

6 <https://www.sadc.int/about-sadc/overview/sadc-objectiv>

7 <https://www.sadc.int/sadc-secretariat>

food crises, persistent poverty, unemployment, and an increasing regional population averaging a 2.88% growth rate per year.

Conceptualising the green economy

The term “green economy” has its roots in a pioneering 1989 report produced for the government of the United Kingdom by a group of leading environmental economists and entitled *Blueprint for a Green Economy*.⁸ The report was later adopted by the UK government as a consensus definition of sustainable development.⁹ Since its inception, several definitions have emerged.

Of much interest to this report is a definition conceptualised by the United Nations Environment Programme (UNEP). UNEP defines the GE as one that results in improved human well-being and social equity, while at the same time reducing environmental risks and ecological scarcities.¹⁰ In brief, a GE is an economy that is low carbon, resource efficient and socially inclusive. In essence, a GE is characterised by an increase in investments in sectors of the economy, while at the same time decreasing ecological deficiencies and environmental threats.¹¹

GE is also used interchangeably with green growth, yet the two concepts are not the same. Green growth simply means taking measures conducive to growth and economic development, while at the same time, ensuring that natural resources and the environment contribute to the country's prosperity.¹² This implies that green growth focuses on accelerating investments and innovations that will underpin sustainable development and provide new opportunities. Nevertheless, the emergence and development of the concepts of both GE and green growth are a movement towards a more integrated and comprehensive approach to incorporating the environment in economic processes.¹³

ICTs and the green economy

Although the GE is still evolving and gaining attraction around the world, there is no question that the production of ICTs also contributes to the environmental crisis. This environmental crisis is likely to undermine the efforts of achieving a GE. For instance, the ICT sector's contribution to global CO₂ emissions is estimated at 2% to 3%. The increase in production of ICT products further exacerbates the problem of the vast and growing quantities of electronic waste. These electronic wastes contain hazardous metals like lead, mercury, toxic flame retardants and plastics.¹⁴ But there is a balance: recent studies also demonstrate that ICTs have made significant contributions to green economic growth in both the developed and developing world. ICTs are being expanded to deliver green products and increase efficiency through dematerialisation, electronic substitution, virtualisation and optimisation. These can bring economic benefits and environmental gains and enhance green growth.¹⁵ In this regard, integrating ICTs in the GE can potentially improve energy efficiency and mitigate CO₂ emissions in the SADC region and Africa in general. For instance, this could be done through:

- Smart appliances: Use of ICTs in appliances to improve efficiency.
- Integrated renewable solutions: Use of simulation, analytical and management tools to enable a wide deployment of renewable energy.
- Intelligent transport: Deployment of advanced sensors, analytical models and ubiquitous communications to enable less polluting forms of transport.
- Smart city planning: Deploying simulation software to improve urban design to optimise energy efficiency.
- Smart industry: Deploying software to forecast, simulate and analyse energy use in production processes.

The ICT landscape in the SADC member states

In view of the potential role of ICTs in supporting the GE and other sectors of the economy, SADC

8 Allen, C., & Clouth, S. (2012). *A Guidebook to the Green Economy*. UN Division for Sustainable Development. <https://sustainabledevelopment.un.org/content/documents/GE%20Guidebook.pdf>

9 Ibid.

10 United Nations Environment Programme. (2011). *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*. https://sustainabledevelopment.un.org/content/documents/126GER_synthesis_en.pdf

11 Kasztelan, A. (2017). Green Growth, Green Economy and Sustainable Development: Terminological and Relational Discourse. *Prague Economic Papers*, 26(4), 487-499. <https://doi.org/10.18267/j.pep.626>

12 Organisation for Economic Co-operation and Development. (2011). *Towards Green Growth: A summary for policy makers*. <https://www.oecd.org/greengrowth/48012345.pdf>

13 Kasztelan, A. (2017). Op. cit.

14 Maclean, D., Akoh, B., & Egede-Nissen, B. (2010). ICTs, sustainability and the green economy. In A. Finlay (Ed.), *Global Information Society Watch 2010: ICTs and environmental sustainability*. APC and Hivos. <https://www.giswatch.org/thematic-report/2010-icts-and-environmental-sustainability/icts-sustainability-and-green-economy>

15 Ibid.

TABLE 1.

ICT penetration in SADC member states

ICT ranking	Country	ICT indicators				
		Internet (%)	Mobile phone (%)	Mobile broadband (%)	Fixed line broadband (%)	ICT Development Index (scores)
1	Mauritius	55.6	145.4	59.0	19.4	5.88
2	Seychelles	58.8	176.6	76.0	16.1	5.03
3	South Africa	56.2	162.0	70.0	3.0	4.96
4	Botswana	41.2	141.4	66.9	2.1	4.59
5	Namibia	36.8	104.5	59.3	2.5	3.89
6	Lesotho	29.8	106.6	49.0	0.2	3.04
7	Zimbabwe	27.1	85.3	41.3	1.1	2.92
8	Zambia	27.9	78.6	42.2	0.2	2.54
9	Mozambique	20.8	40.0	25.7	0.1	2.32
10	Angola	11.3	44.7	14.6	0.3	1.94
11	Tanzania	16.0	69.7	8.7	3.2	1.81
12	Malawi	13.8	41.7	25.5	0.06	1.74
13	Madagascar	9.8	34.1	13.0	0.1	1.68
14	DRC	8.6	43.4	16.2	0.001	1.55
15	Eswatini	30.3	76.9	13.1	0.6	-

developed an ICT strategy in 2013.¹⁶ The objective of the strategy is to promote reforms and the continuous modernisation of SADC countries. The ICT strategy outcomes are to ensure that SADC member countries grow their ICT sectors to enhance socio-economic growth.¹⁷ Table 1 shows the ICT landscape in SADC member states, focusing on internet penetration, mobile penetration, mobile broadband and fixed broadband, and gives each country's ICT Development Index score from the International Telecommunication Union (ITU).¹⁸

As Table 1 indicates, in terms of ICT penetration and the ICT Development Index in the SADC, Mauritius is ranked number one, followed by Seychelles, South Africa, Botswana and Namibia. The remaining member countries show variations in both ICT penetration rates and overall ICT Development Index performance. For instance, countries such as Malawi, the DRC, Madagascar, Tanzania and Angola have low internet penetration rates, which impact negatively on the overall ICT Development Index score. This implies that the majority of SADC member states need to do more to improve their ICT sectors. This variation could be attributed to differences in priority targets and commitments that

each member state puts on the ICT sector. However, the overarching argument is that the variation in ICT penetration maturities in SADC member states impacts the development of a GE agenda.

The SADC approach to a green economy

The SADC views the GE as a catalyst to the socio-economic transformation of the region towards a resource-efficient, climate change-resilient, environmentally sustainable, low-carbon development and equitable society.¹⁹ In this regard, a GE is seen as a vehicle to reach sustainable development, address the challenges observed in the region in recent years (e.g. poverty, unemployment, inequality, economic vulnerability to energy prices and trade, deforestation and loss of biodiversity, etc.) and to turn them into opportunities.²⁰

Building on these considerations, while using the SADC Protocol on Environmental Management for Sustainable Development and outcomes of Rio+20 as benchmarks, the SADC expressed the intention to develop a Regional Green Economy Strategy and Action Plan for Sustainable Development in 2015.²¹

The objective of the strategy is to facilitate a balanced and accelerated attainment of the agreed

¹⁶ Southern African Development Community. (2013). *SADC Customs Information and Communication Technology Strategy*. https://www.sadc.int/files/5213/7415/0051/ICT_Strategy.pdf

¹⁷ Ibid.

¹⁸ <https://www.itu.int/net4/ITU-D/idi/2017>

¹⁹ Southern African Development Community. (2015). Op. cit.

²⁰ Ibid.

²¹ Ibid.

TABLE 2.

GE ranking in SADC member states

GGEI ranking	Country	GDP/capita (USD) ²²	GGEI scores ²³	GGGI scores ²⁴
1	Zambia	1291.3	0.5740	26.89
2	Mauritius	11203.5	0.5162	42.63
3	Tanzania	1122.1	0.4908	44.32
4	Madagascar	522.2	0.4775	33.79
5	Seychelles	17401.7	0.4723	–
6	Malawi	411.6	0.4602	29.43
7	South Africa	6001.4	0.4376	36.62
6	Lesotho	1157.5	0.4304	–
9	Mozambique	491.8	0.4304	–
10	Zimbabwe	1464.0	0.4304	25.71
11	Eswatini	3837.0	0.4299	–
12	DRC	545.2	0.4259	–
13	Namibia	4957.5	0.4146	–
14	Angola	2973.6	0.3834	–
15	Botswana	7961.3	0.3834	45.88

goals anchoring on three pillars of sustainable development:

- Environmental sustainability
- Economic well-being
- Social equity.

The GE strategy has 10 sectors that are critical to the achievement of the GE in the SADC region: agriculture, water, forest and biodiversity, fisheries, energy, manufacturing and mining, waste, transport, tourism and human settlements.

Current state of the GE in SADC member states

To establish the current situation of the GE in SADC member states, this report used the Global Green Economy Index (GGEI). The GGEI measures the GE performance of 130 countries and how experts assess that performance. Both quantitative and qualitative indicators are used to measure how well each country performs based on four key dimensions: leadership and climate change, efficiency in sectors,

market and investments, and environment.²⁵ These four dimensions are used cumulatively to understand how each country ranks. The score values range between 0 to 1. A country with a value of 1 ranks high on the GGEI, while 0 denotes a low ranking.

In addition, the Global Green Growth Index (GGGI) was used. The GGGI measures country performance in achieving sustainability targets including the Sustainable Development Goals (SDGs), the Paris Climate Agreement and the Aichi Biodiversity Targets.²⁶ The GGGI has four dimensions, namely efficient and sustainable resource use, natural capital protection, green growth opportunities, and social inclusion. The score values range between 0 to 100. Cumulatively, the higher the value on the GGGI a country scores, the higher the performance is ranked, and vice versa. Table 2 provides a summary of the GE ranking in SADC member states.

Looking at Table 2, it is clear that Zambia is the top-ranking country in the SADC when it comes to GE, followed by Mauritius, Tanzania, Madagascar and Seychelles in the top five. Taking into account the GDP/capita of these top five countries, most of their impressive GGEI scores are due to the efficiency in the sectors dimension. Literature shows that these countries have put much effort into renewable energy, reducing emissions in the transport sector, and have committed to sustainable tourism.

22 <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD?locations=ZG>

23 Tamanini, J. (2016). *Global Green Economy Index 2016*. Dual Citizen. https://www.greengrowthknowledge.org/sites/default/files/downloads/resource/The%20Global%20Green%20Economy%20Index_2016.pdf

24 Global Green Growth Institute. (2019). *Green Growth Index: Concepts, Methods and Applications*. http://greengrowthindex.gggi.org/wp-content/uploads/2019/12/Green-Growth-Index-Technical-Report_20191213.pdf

25 Dual Citizen. (2018). *Global Green Economy Index 2018*. <https://dualcitizeninc.com/global-green-economy-index>

26 Global Green Growth Institute. (2019). Op. cit.

TABLE 3.

A sample of GE initiatives in selected SADC member states

GE initiative(s)	Sector(s)	Country
Green Jobs Programme	Human settlements	Zambia ²⁷
Green Jobs Programme	Fishing, agriculture, energy	Mauritius ²⁸
SUNREF: a green credit for business	Energy, tourism, agriculture	Namibia ²⁹
Green Fund of South Africa	All sectors	South Africa ³⁰
50MW Khi Solar One Project	Energy	
Tshwane Food and Energy Centre	Agriculture, energy	
Recycling Pallets Pays	Waste management	
Pro-poor Renewable Energy	Energy	
Tozzi Green Project	Agriculture, energy	Mozambique ³¹
Solar Energy Kiosks Project	Energy	Madagascar ³²
		Malawi

However, these countries may improve the score further when their political leadership extends their focus to the market and investment dimension, where greater attention should be placed on clean tech innovation and corporate sustainability. On the other hand, member countries lagging behind in the GE need to improve all four of the GGEL dimensions to better their performance.

Surprisingly, when one considers the GGGI scores, the results indicate that Botswana, Tanzania and Mauritius are highly ranked, not only in the SADC region, but also in Africa.³³ Since the GGGI measures the performance of a country in achieving sustainability targets, these three countries are the only ones with potential to achieve the UN's SDGs, the Paris Climate Agreement and the Aichi Biodiversity Targets. Further analysis shows that SADC countries with a high ICT Development Index score such as Mauritius, Seychelles, South Africa, Botswana and Namibia (See Table 1) do not rank highly when it comes to GE rankings. For instance, Zambia is ranked number one in GE, but it is ranked average (number eight) on the ICT Development Index. This implies

that ICT development does not directly influence GE development.

However, the opposite can also be said to be true. Countries in the SADC with a low ICT development ranking have also a low GE ranking. This demonstrates a positive relationship. Mauritius is ranked number one on the ICT Development Index and number two on the GGGI. This suggests that ICTs might have an influence on the GE development in that country. However, the overall analysis is that it is not clear whether the ICT development of a particular SADC member state directly or indirectly influences the outcome of the GE development agenda. More detailed research is needed to establish the relationship between ICT development and the country's transition to a GE.

Uptake of the GE in selected SADC countries

Despite the difference in levels of ICTs and GE developments in the SADC region, member states have shown commitments to implement various GE initiatives based on the 10 sectors of the SADC's Green Economy Strategy and Action Plan for Sustainable Development. Evidence from the literature further suggests that there are a number of GE initiatives existing at different levels of maturity, cutting across all the sectors of the economy. For instance, South Africa has over 357 GE initiatives spread across all the nine provinces covering the energy, agriculture, waste management and water sectors, just to mention a few.³⁴

These GE initiatives demonstrate positive impact on green job creation, small and medium enterprise (SME) development, sustainable management of resources, and social inclusion. For instance, since the implementation of Zambia's Green Jobs

27 <http://zambiagreenjobs.org/>

28 https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_317238.pdf

29 International Labour Organization. (n/d). *Green jobs in Namibia: Opportunities for job creation in the green economy*. https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_250687.pdf

30 PAGE. (2017). *Green Economy Inventory for South Africa: An Overview*. https://www.un-page.org/files/public/green_economy_inventory_for_south_africa.pdf

31 <https://gggi.org/project/scaling-up-pro-poor-renewable-energy-in-mozambique>

32 <https://www.tozzigreen.com/en/progetto/agriculture-and-sustainable-growth>

33 Ibid.

34 PAGE. (2017). Op. cit.

Programme in 2015, the project has trained 1,500 SMEs in entrepreneurship skills, fostered private sector participation, and enabled a conducive environment for doing green business. In the long run, SMEs had created over 2,660 decent and green jobs with programme support for two years.³⁵

Evidence indicates that the majority of GE initiatives are financed by both local and international donors, and are being implemented through the public-private-partnership model. While this implementation model is encouraging, the literature also reveals that a number of them are implemented as small pilot projects, sometimes without a robust theoretical foundation for sustainability. As a result, few of these projects have scaled up to national level, partly due to financial constraints and lack of capacity. Table 3 presents a sample of notable GE initiatives in selected SADC member states.

Conclusion

In conclusion, this report has demonstrated that the SADC region recognises the importance of the GE. Many GE initiatives are being implemented at different levels of maturity targeting various sectors of the economy. However, based on the GGEl, the majority of SADC countries, despite their commitments, are lagging behind and need to do more to improve the development of the GE. In addition, the report has shown that the ICT development in SADC countries is still low, such that only a few countries are doing well.

The report has also revealed that the level of ICT development of a particular member state does not automatically translate into a GE. A review of literature also demonstrates that although the SADC has both a regional ICT strategy and a regional GE strategy, these policy documents are not talking to each other. For instance, there is no section in the SADC's regional GE strategy where the necessary elements of ICTs are spelled out to complement the GE development regime. Likewise, the ICT strategy is silent on GE development. Rather, the ICT strategy focuses on the regional collaboration of SADC countries on the computerisation of customs operations,³⁶ while the SADC ICT Sector Regional Infrastructure Development Master Plan aims only to address the high costs of internet usage, and telephony infrastructure in the region.³⁷

This disconnect in policy strategies implies that the SADC regional GE strategy needs to be revised to integrate the use of ICTs to ensure meaningful GE development in the region.

Nevertheless, some of the policy objectives in the ICT strategies are relevant to the GE, even if they are not framed in the context of environmental sustainability. To maximise the contribution of ICTs to the development of the GE, affordable access to broadband networks and services must be available to as many people as possible in the SADC region. This will enable the dematerialisation of physical products, services and processes through e-commerce, telework, online education, health care and other public services.³⁸ It will also provide the widest possible scope for bottom-up, user-generated green innovation enabled by ICTs such as the internet and social media.

Finally, all the key sectors in the SADC countries are active in or associated with GE initiatives in some way, though the agricultural sector is taking a leading role. Many of the GE initiatives in SADC countries are multistakeholder partnerships. The implementation of the GE in SADC countries provides both opportunities and challenges, which call for governments, academia, civil society groups, tech companies, private sectors, international funders and other stakeholders to collaborate in one way or another.

Action steps

This report has established that the transition of the SADC region to a GE will not happen automatically. This calls for certain urgent action steps to be put in place:

- There is a need for adequate funding for the green economy, including mechanisms for the mobilisation of domestic and international resources.
- SADC member states should engage civil society groups to help create public awareness and empower citizens with respect to GE initiatives.
- Member states should promote innovation and accelerate the dissemination of GE technologies in the SADC region by removing trade barriers.
- The SADC should enhance the capacities of its member states to adapt and deploy green technologies and integrate them in national development planning, targeting all sectors of the economy.

35 Zambia Green Jobs Programme. (2015). *Annual Impact Report 2015*. http://zambiagreenjobs.org/images/zambia/articoli/pdf/ZGJP_2015AnnualImpactReport.pdf

36 Southern African Development Community. (2013). Op. cit.

37 Southern African Development Community. (2012). *SADC ICT Sector Regional Infrastructure Development Master Plan*. https://www.sadc.int/files/9413/5293/3532/Regional_Infrastructure_Development_Master_Plan_ICT_Sector_Plan.pdf

38 MacLean, D. (2011). *ICTs as Enablers of the Green Economy: A brief on Internet policy issues*. https://www.iisd.org/sites/default/files/publications/icts_enablers_green_economy.pdf

- The SADC should create programmes for the application of ICTs in energy-saving roles across all relevant industry sectors of the economy.
- SADC countries should provide better funding and incentives to encourage the involvement of businesses in the development of the green economy through innovative public-private funding mechanisms, as well as awards and public recognition.
- SADC countries should engage businesses in policy dialogue and planning to work together in integrating plans and actions to achieve green economic growth.
- Member states should provide better information and coordination that help all sectors of society better understand the government's development priorities in the context of the GE.
- There is also a need to promote knowledge management and sharing. A review of literature has shown that there is a wealth of information on GE policies, initiatives and reports held by SADC member states, but they are not centralised in a repository. Therefore, the SADC Secretariat and member states in general should develop a consolidated GE information database that is useful to support informed decision making, policy coherence, and cross-cutting action on GE issues.³⁹

³⁹ PAGE. (2017). Op. cit.

Technology, the environment and a sustainable world: Responses from the global South

The world is facing an unprecedented climate and environmental emergency. Scientists have identified human activity as primarily responsible for the climate crisis, which together with rampant environmental pollution, and the unbridled activities of the extractive and agricultural industries, pose a direct threat to the sustainability of life on this planet.

This edition of Global Information Society Watch (GISWatch) seeks to understand the constructive role that technology can play in confronting the crises. It disrupts the normative understanding of technology being an easy panacea to the planet's environmental challenges and suggests that a nuanced and contextual use of technology is necessary for real sustainability to be achieved. A series of thematic reports frame different aspects of the relationship between digital technology and environmental sustainability from a human rights and social justice perspective, while 46 country and regional reports explore the diverse frontiers where technology meets the needs of both the environment and communities, and where technology itself becomes a challenge to a sustainable future.

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