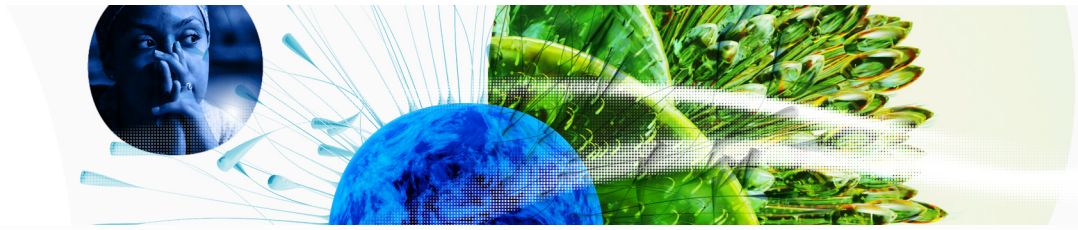
Global Innovation Index 2023



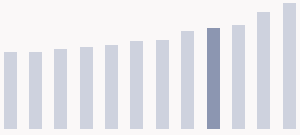
The Global Innovation Index (GII) **ranks world economies according to their innovation capabilities.**

Consisting of **roughly 80 indicators**, grouped into innovation inputs and outputs, the GII **aims to capture the multi-dimensional facets of innovation**.

Zambia ranking in the Global Innovation Index 2023

> Zambia ranks 118th among the 132 economies featured in the GII 2023.

> Zambia ranks 4th among the 12 low-income group economies.



> Zambia ranks 16th among the 28 economies in Sub-Saharan Africa.

> Zambia GII Ranking (2020-2023)

The table shows the rankings of Zambia over the past four years. Data availability and changes to the GII model framework influence year-on-year comparisons of the GII rankings. The statistical confidence interval for the ranking of Zambia in the GII 2023 is between ranks 112 and 120.

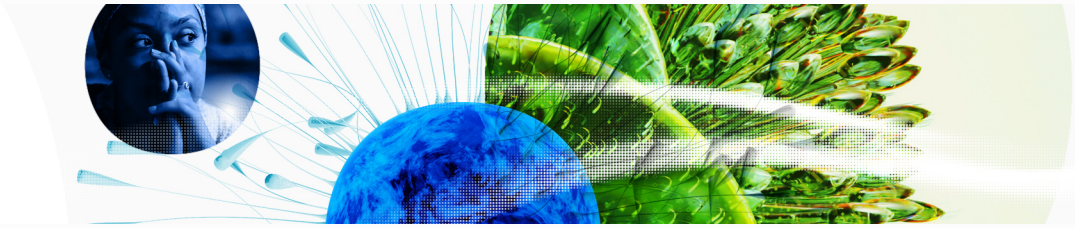
	GII Position	Innovation Inputs	Innovation Outputs
2020	122nd	109th	128th
2021	121st	111st	127th
2022	118th	118th	115th
2023	118th	111st	122nd

Zambia performs worse in innovation outputs than innovation inputs in 2023.

This year Zambia ranks 111st in innovation inputs. This position is higher than last year.

Zambia ranks 122nd in innovation outputs. This position is lower than last year.

Global Innovation Index 2023

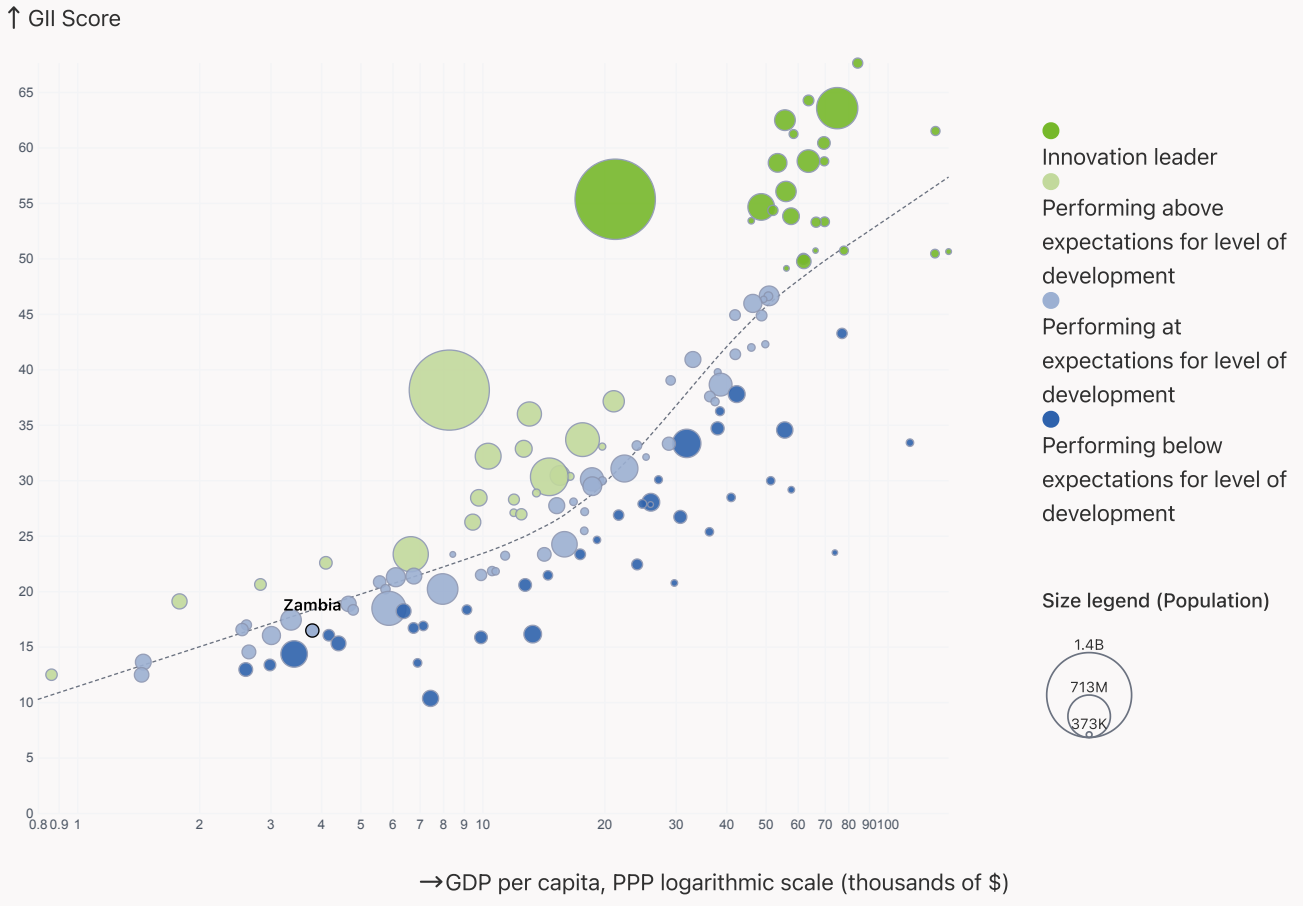


→ Expected vs. observed innovation performance

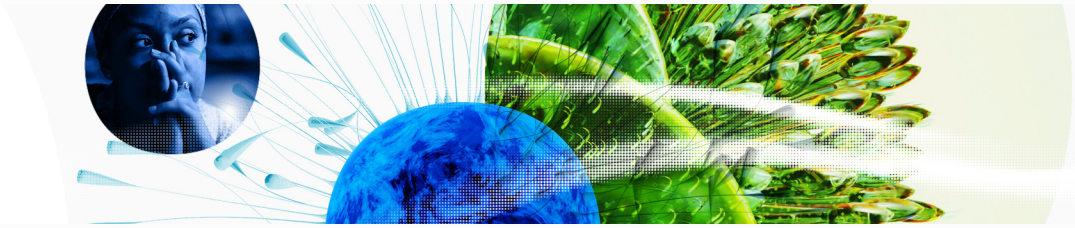
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected and those below are performing below expectations.

> Relative to GDP, Zambia's performance is at expectations for its level of development.

> Innovation overperformers relative to their economic development



Global Innovation Index 2023

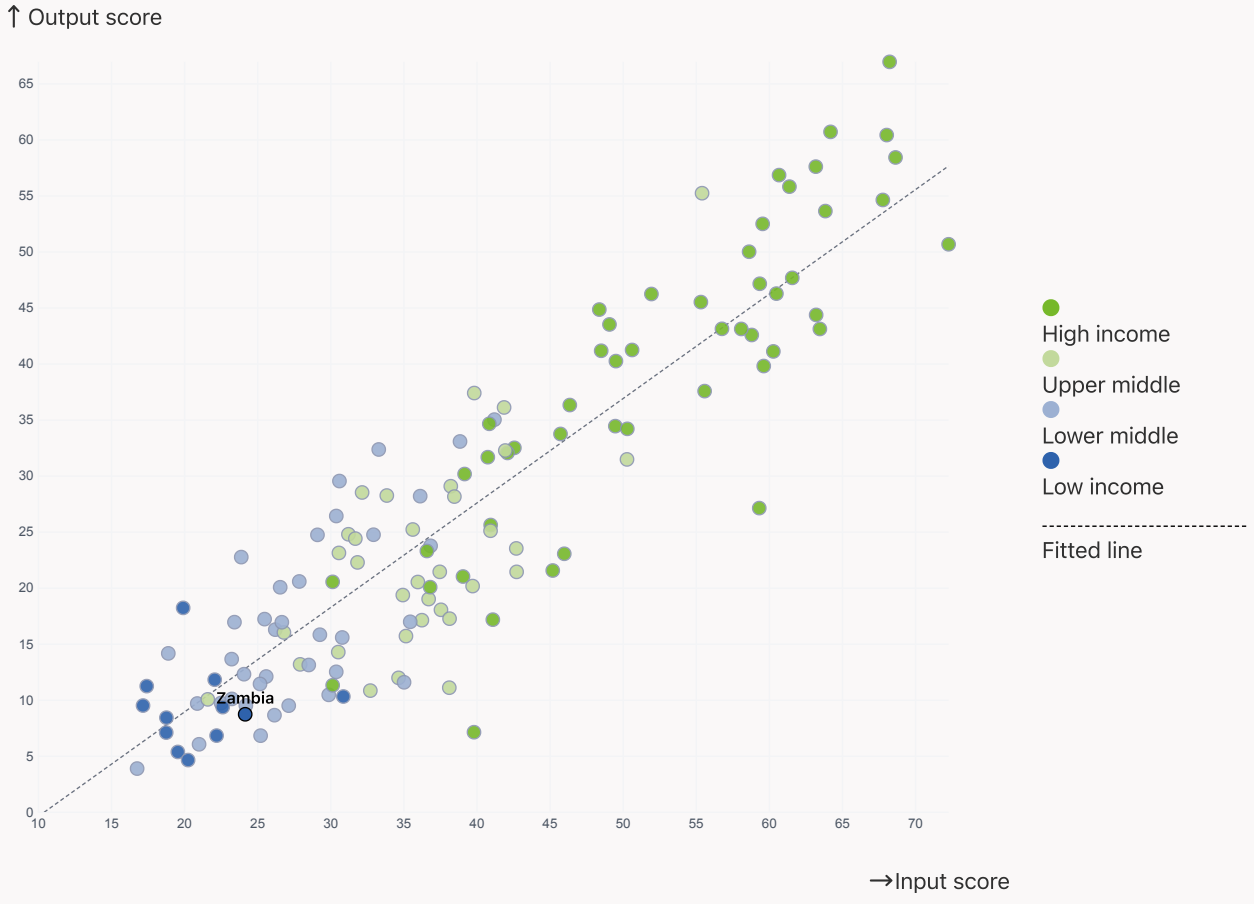


→ Effectively translating innovation investments into innovation outputs

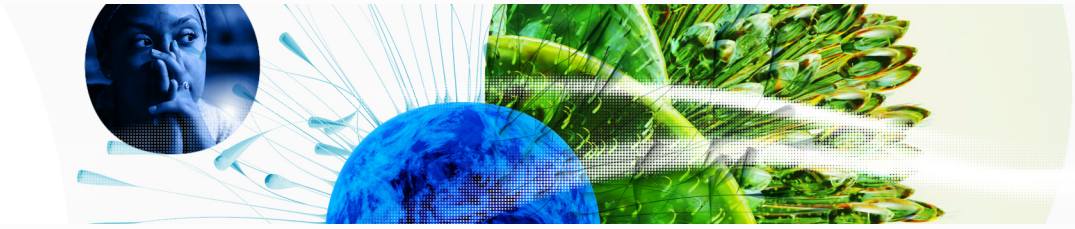
The chart below shows the relationship between innovation inputs and innovation outputs. Economies above the line are effectively translating costly innovation investments into more and higher-quality outputs.

> Zambia produces less innovation outputs relative to its level of innovation investments.

> Relationship between innovation inputs and outputs

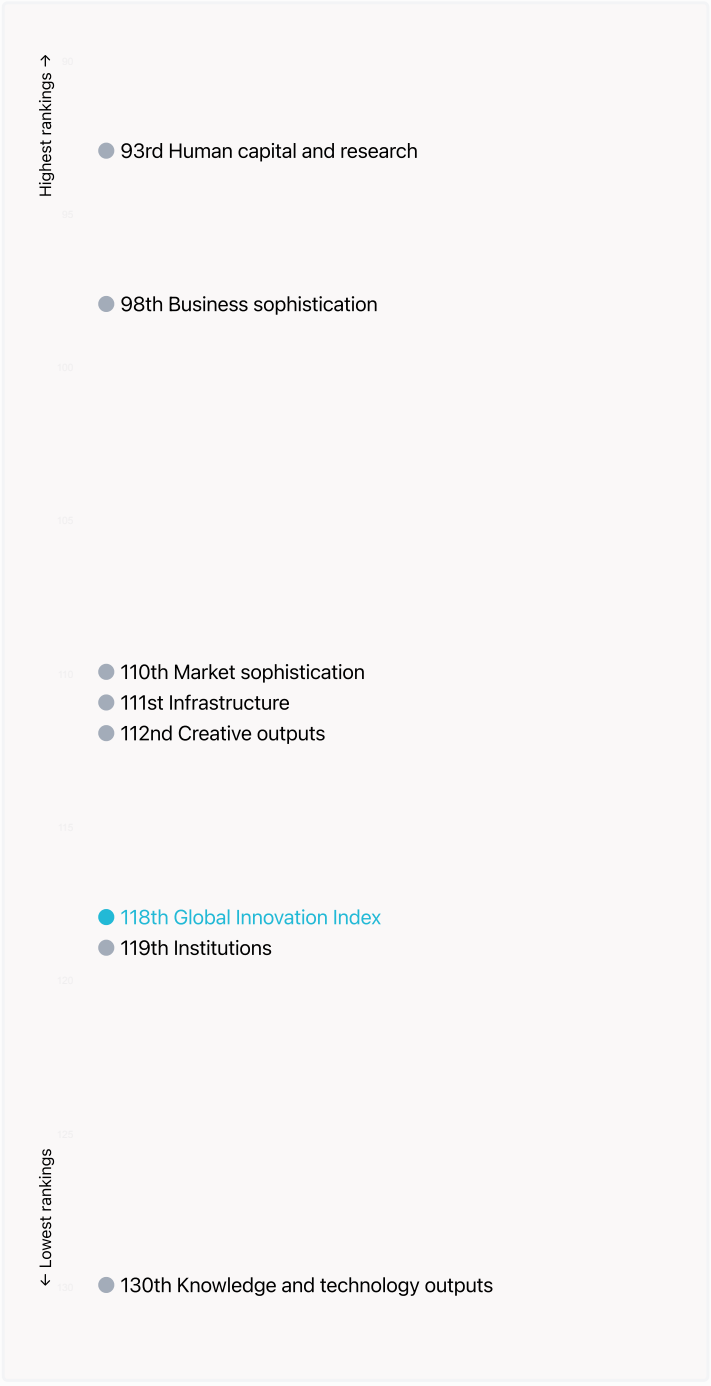


Global Innovation Index 2023



→ Overview of Zambia's rankings in the seven areas of the GII in 2023

The chart shows the ranking for each of the seven areas that the GII comprises. The strongest areas for Zambia are those that rank above the GII (shown in blue) and the weakest are those that rank below.



> Highest rankings

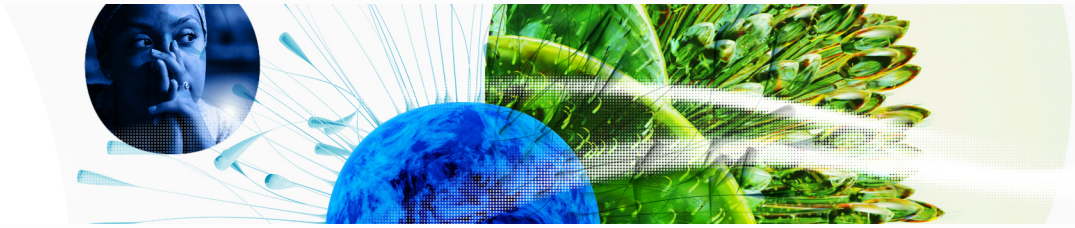
Zambia ranks highest in Human capital and research (93rd), Business sophistication (98th), Market sophistication (110th), Infrastructure (111st) and Creative outputs (112nd).

> Lowest rankings

Zambia ranks lowest in Knowledge and technology outputs (130th), Institutions (119th) and Creative outputs (112nd).

The full WIPO Intellectual Property Statistics profile for Zambia can be found on this link.

Global Innovation Index 2023



→ Benchmark of Zambia against other country groupings for each of the seven areas of the GII Index

The charts shows the relative position of Zambia (blue bar) against other country groupings (grey bars), for each of the seven areas of the GII Index.

> Low-Income economies

Zambia performs above the low-income group average in Creative outputs, Business sophistication, Market sophistication, Human capital and research, Infrastructure.

> Sub-Saharan Africa

Zambia performs below the regional average in Knowledge and technology outputs, Creative outputs, Institutions.

Knowledge and technology outputs

- Top 10 | Score: 58.96
- Sub-Saharan Africa | Score: 12.16
- Low income | Score: 11.03
- Zambia | Score: 8.73

Creative outputs

- Top 10 | 56.09
- Sub-Saharan Africa | 10.36
- Zambia | 8.65
- Low income | 7.48

Business sophistication

- Top 10 | 64.39
- Zambia | 21.69
- Sub-Saharan Africa | 19.85
- Low income | 16.81

Market sophistication

- Top 10 | 61.93
- Zambia | 21.74
- Sub-Saharan Africa | 20.00
- Low income | 15.67

Human capital and research

- Top 10 | 60.28
- Zambia | 22.65
- Sub-Saharan Africa | 17.80
- Low income | 15.55

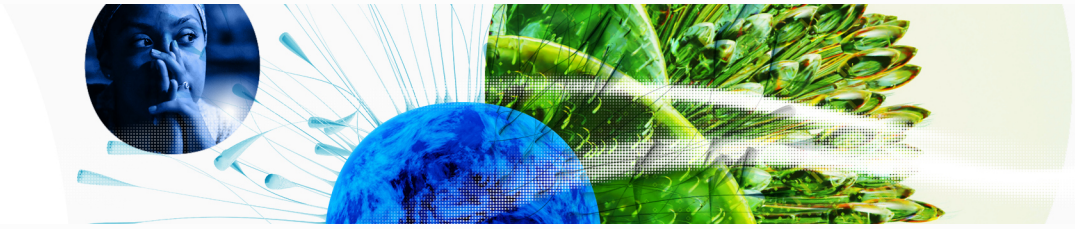
Infrastructure

- Top 10 | 62.83
- Zambia | 23.52
- Sub-Saharan Africa | 23.36
- Low income | 19.43

Institutions

- Top 10 | 79.85
- Sub-Saharan Africa | 43.27
- Low income | 38.42
- Zambia | 31.34

Global Innovation Index 2023



→ Innovation strengths and weaknesses in Zambia

The table below gives an overview of the indicator strengths and weaknesses of Zambia in the GII 2023.

> Zambia's main innovation strengths are **Gross capital formation, % GDP** (rank 21), **Loans from microfinance institutions, % GDP** (rank 22) and **Industrial designs by origin/bn PPP$ GDP** (rank 41).

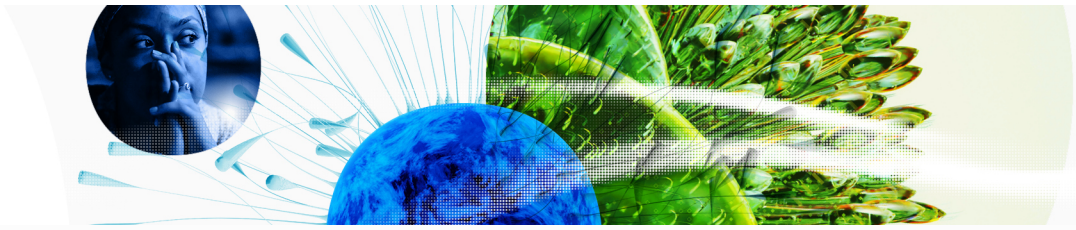
Strengths

Rank	Code	Indicator name
21	3.2.3	Gross capital formation, % GDP
22	4.1.3	Loans from microfinance institutions, % GDP
41	7.1.4	Industrial designs by origin/bn PPP$ GDP
42	5.1.2	Firms offering formal training, %
57	4.2.3	VC recipients, deals/bn PPP$ GDP
65	5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP
73	1.3.1	Policies for doing business
73	5.2.2	State of cluster development
74	7.1.2	Trademarks by origin/bn PPP$ GDP
78	3.3.2	Environmental performance

Weaknesses

Rank	Code	Indicator name
128	1.2.3	Cost of redundancy dismissal
125	7.3.1	Generic top-level domains (TLDs)/th pop. 15-69
123	5.3.2	High-tech imports, % total trade
122	5.3.4	FDI net inflows, % GDP
101	6.1.2	PCT patents by origin/bn PPP$ GDP
95	5.2.5	Patent families/bn PPP$ GDP
74	7.1.3	Global brand value, top 5,000
71	2.3.4	QS university ranking, top 3
48	6.2.2	Unicorn valuation, % GDP
40	2.3.3	Global corporate R&D investors, top 3, mn US$

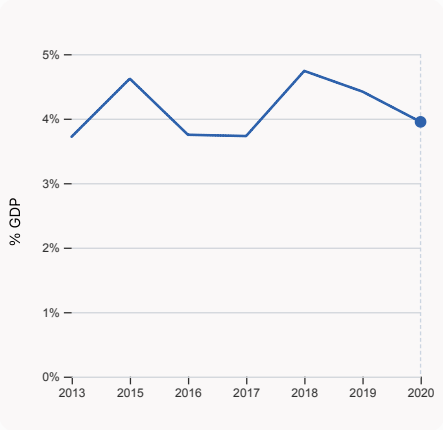
Global Innovation Index 2023



→ Zambia's innovation system

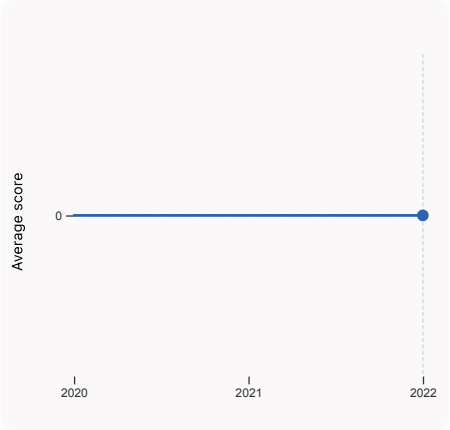
As far as practicable, the plots below present unscaled indicator data.

> Innovation inputs in Zambia



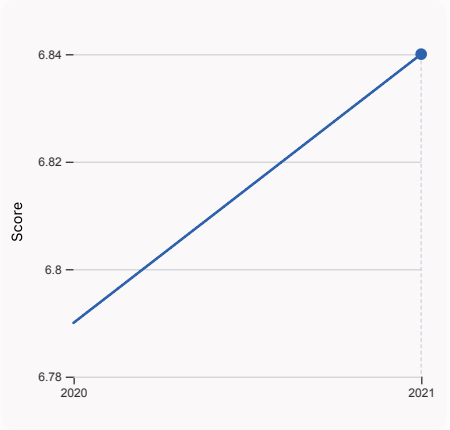
2.1.1 Expenditure on education, % GDP

was equal to 3.95% GDP in 2020, down by 0.47 percentage points from the year prior – and equivalent to an indicator rank of 74.



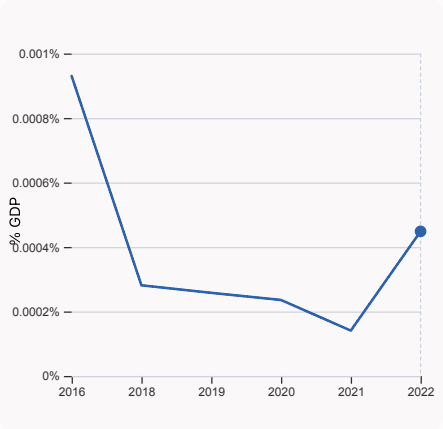
2.3.4 QS university ranking, top 3

was equal to an average score of 0 for the top 3 universities in 2022, equivalent to an indicator rank of 71.



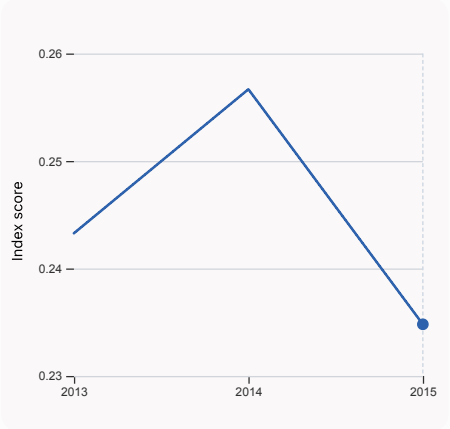
3.1.1 ICT access

was equal to a score of 6.84 in 2021, up by 0.74% from the year prior – and equivalent to an indicator rank of 105.



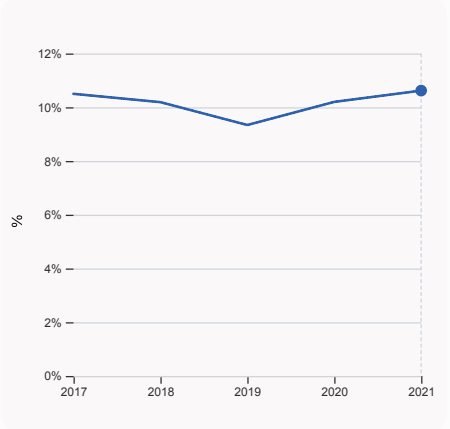
4.2.4 VC received, value, % GDP

was equal to 0.00045% GDP in 2022, up by 0.00031 percentage points from the year prior – and equivalent to an indicator rank of 70.



4.3.2 Domestic industry diversification

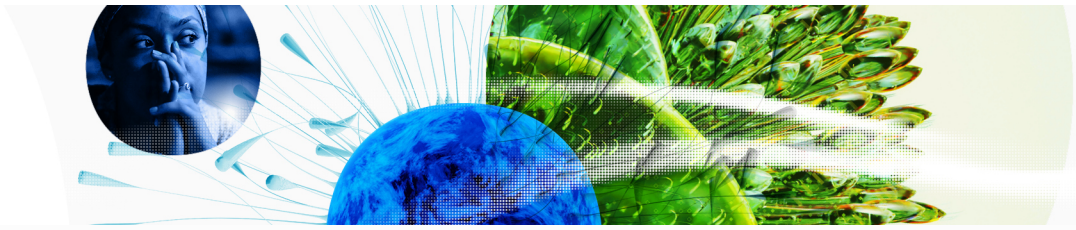
was equal to an index score of 0.235 in 2015, down by 8.52% from the year prior – and equivalent to an indicator rank of 82.



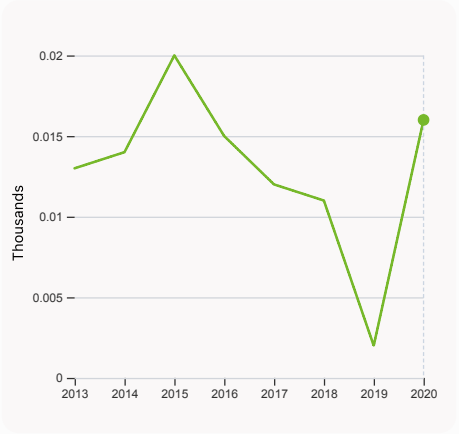
5.1.1 Knowledge-intensive employment, %

was equal to 10.62% in 2021, up by 0.42 percentage points from the year prior – and equivalent to an indicator rank of 106.

Global Innovation Index 2023

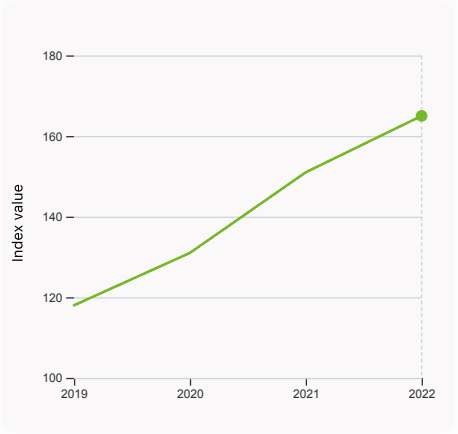


> Innovation outputs in Zambia



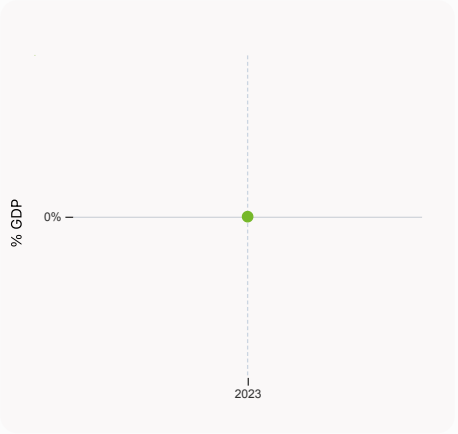
6.1.1 Patents by origin

was equal to 0.016 Thousands in 2020, up by 700% from the year prior – and equivalent to an indicator rank of 93.



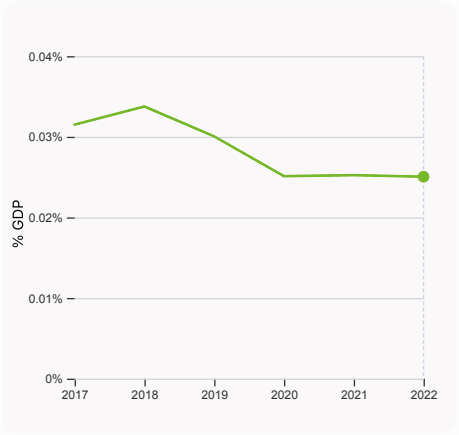
6.1.5 Citable documents H-index

was equal to an index value of 165 in 2022, up by 9.27% from the year prior – and equivalent to an indicator rank of 90.



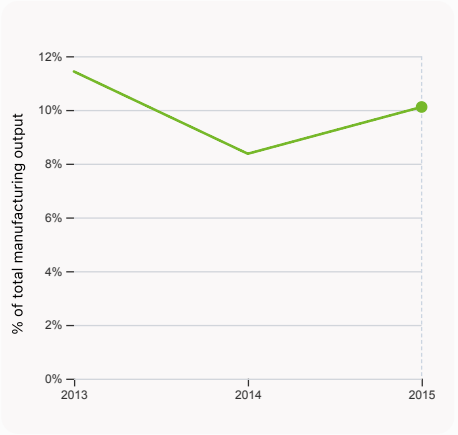
6.2.2 Unicorn valuation, % GDP

was equal to 0 % GDP in 2023 – and equivalent to an indicator rank of 48.



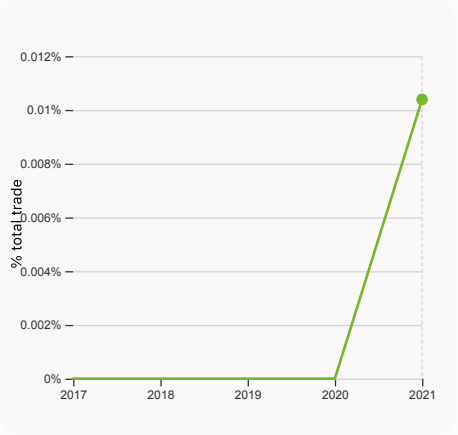
6.2.3 Software spending, % GDP

was equal to 0.025% GDP in 2022, down by 0.0002 percentage points from the year prior – and equivalent to an indicator rank of 118.



6.2.4 High-tech manufacturing, %

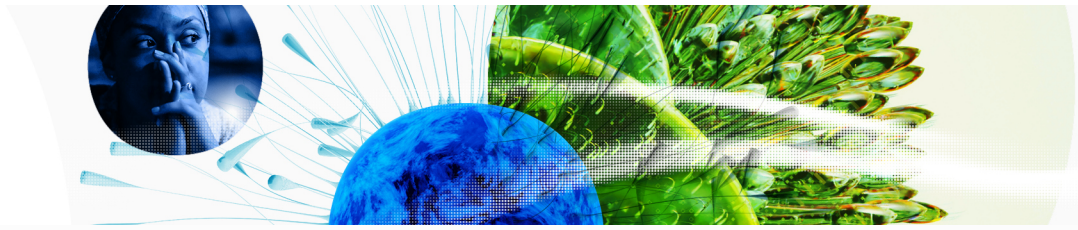
was equal to 10.11% of total manufacturing output in 2015, up by 1.74 percentage points from the year prior – and equivalent to an indicator rank of 91.

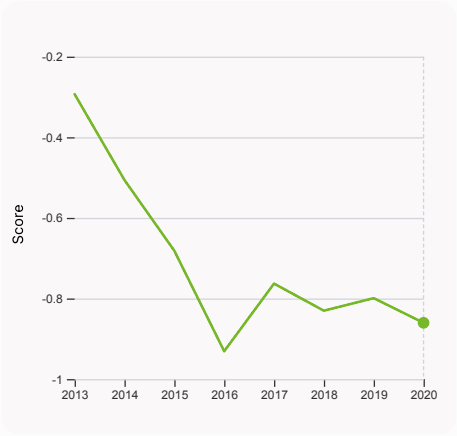


6.3.1 Intellectual property receipts, % total trade

was equal to 0.01% total trade in 2021 0.01 – and equivalent to an indicator rank of 100.

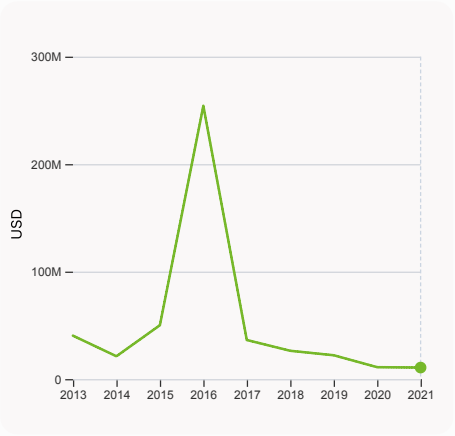
Global Innovation Index 2023





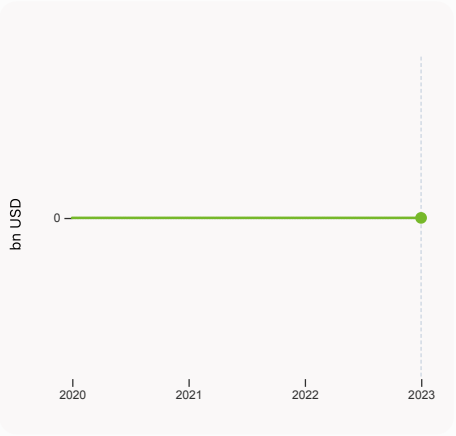
6.3.2 **Production and export complexity**

was equal to a score of -0.86 in 2020, down by 7.66% from the year prior – and equivalent to an indicator rank of 103.



6.3.3 **High-tech exports**

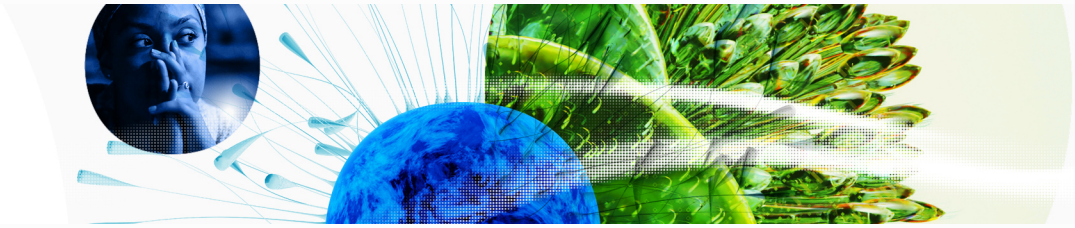
was equal to 10,749,398 USD in 2021, down by 3.21% from the year prior – and equivalent to an indicator rank of 116.



7.1.3 **Global brand value, top 5,000**

was equal to 0 bn USD in 2023 – and equivalent to an indicator rank of 74.

Global Innovation Index 2023



Zambia

GII 2023 rank **118**

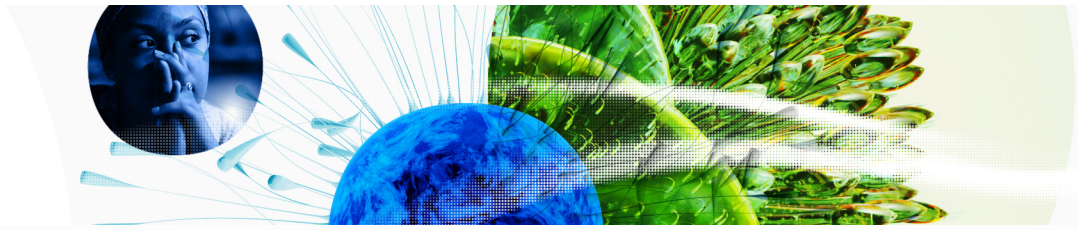
Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
122	111	Low	SSA	20.0	76.3	3,808.1

	Score / Value	Rank	
Institutions	**31.3**	**119**	
1.1 Institutional environment	**28.3**	**104**	
1.1.1 Operational stability for businesses*	42.4	86	
1.1.2 Government effectiveness*	14.2	119	
1.2 Regulatory environment	**20.4**	**130**	○ ◇
1.2.1 Regulatory quality*	27.8	102	
1.2.2 Rule of law*	22.3	99	
1.2.3 Cost of redundancy dismissal	50.6	128	○ ◇
1.3 Business environment	**45.4**	**[68]**	
1.3.1 Policies for doing business†	45.4	73	● ◆
1.3.2 Entrepreneurship policies and culture†	n/a	n/a	
Human capital and research	**22.7**	**[93]**	
2.1 Education	**45.3**	**[80]**	
2.1.1 Expenditure on education, % GDP	3.9	74	
2.1.2 Government funding/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3 School life expectancy, years	n/a	n/a	
2.1.4 PISA scales in reading, maths and science	n/a	n/a	
2.1.5 Pupil-teacher ratio, secondary	21.1	103	
2.2 Tertiary education	**n/a**	**[n/a]**	
2.2.1 Tertiary enrolment, % gross	n/a	n/a	
2.2.2 Graduates in science and engineering, %	n/a	n/a	
2.2.3 Tertiary inbound mobility, %	n/a	n/a	
2.3 Research and development (R&D)	**0.0**	**[119]**	
2.3.1 Researchers, FTE/mn pop.	n/a	n/a	
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3 Global corporate R&D investors, top 3, mn US$	0.0	40	○ ◇
2.3.4 QS university ranking, top 3*	0.0	71	○ ◇
Infrastructure	**23.5**	**111**	
3.1 Information and communication technologies (ICTs)	**37.7**	**111**	
3.1.1 ICT access*	52.3	105	◆
3.1.2 ICT use*	24.1	121	
3.1.3 Government's online service*	38.3	111	
3.1.4 E-participation*	36.0	93	
3.2 General infrastructure	**18.3**	**97**	
3.2.1 Electricity output, GWh/mn pop.	932.3	98	◆
3.2.2 Logistics performance*	n/a	n/a	
3.2.3 Gross capital formation, % GDP	31.5	21	● ◆
3.3 Ecological sustainability	**14.6**	**104**	◆
3.3.1 GDP/unit of energy use	5.5	113	
3.3.2 Environmental performance*	33.1	78	● ◆
3.3.3 ISO 14001 environment/bn PPP$ GDP	0.2	118	
Market sophistication	**21.7**	**110**	◆
4.1 Credit	**9.7**	**113**	
4.1.1 Finance for startups and scaleups†	n/a	n/a	
4.1.2 Domestic credit to private sector, % GDP	15.2	118	
4.1.3 Loans from microfinance institutions, % GDP	1.3	22	● ◆
4.2 Investment	**5.9**	**[71]**	
4.2.1 Market capitalization, % GDP	n/a	n/a	
4.2.2 Venture capital (VC) investors, deals/bn PPP$ GDP	n/a	n/a	
4.2.3 VC recipients, deals/bn PPP$ GDP	0.0	57	● ◆
4.2.4 VC received, value, % GDP	0.0	70	
4.3 Trade, diversification, and market scale	**49.6**	**87**	◆
4.3.1 Applied tariff rate, weighted avg., %	4.8	89	◆
4.3.2 Domestic industry diversification	78.4	82	
4.3.3 Domestic market scale, bn PPP$	76.3	93	

	Score / Value	Rank	
Business sophistication	**21.7**	**98**	◆
5.1 Knowledge workers	**22.8**	**[90]**	
5.1.1 Knowledge-intensive employment, %	10.6	106	
5.1.2 Firms offering formal training, %	36.6	42	● ◆
5.1.3 GERD performed by business, % GDP	n/a	n/a	
5.1.4 GERD financed by business, %	n/a	n/a	
5.1.5 Females employed w/advanced degrees, %	3.8	98	◆
5.2 Innovation linkages	**21.0**	**67**	● ◆
5.2.1 University-industry R&D collaboration†	38.6	77	
5.2.2 State of cluster development†	38.8	73	● ◆
5.2.3 GERD financed by abroad, % GDP	n/a	n/a	
5.2.4 Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	65	● ◆
5.2.5 Patent families/bn PPP$ GDP	0.0	95	○ ◇
5.3 Knowledge absorption	**21.2**	**125**	○
5.3.1 Intellectual property payments, % total trade	0.3	86	◆
5.3.2 High-tech imports, % total trade	4.2	123	○ ◇
5.3.3 ICT services imports, % total trade	0.5	109	◇
5.3.4 FDI net inflows, % GDP	-0.0	122	○
5.3.5 Research talent, % in businesses	n/a	n/a	
Knowledge and technology outputs	**8.7**	**130**	○
6.1 Knowledge creation	**6.8**	**100**	
6.1.1 Patents by origin/bn PPP$ GDP	0.3	93	
6.1.2 PCT patents by origin/bn PPP$ GDP	0.0	101	○ ◇
6.1.3 Utility models by origin/bn PPP$ GDP	n/a	n/a	
6.1.4 Scientific and technical articles/bn PPP$ GDP	n/a	n/a	
6.1.5 Citable documents H-index	6.8	90	
6.2 Knowledge impact	**11.3**	**127**	○ ◇
6.2.1 Labor productivity growth, %	-1.3	120	◇
6.2.2 Unicorn valuation, % GDP	0.0	48	○ ◇
6.2.3 Software spending, % GDP	0.0	118	
6.2.4 High-tech manufacturing, %	10.1	91	
6.3 Knowledge diffusion	**8.1**	**118**	
6.3.1 Intellectual property receipts, % total trade	0.0	100	
6.3.2 Production and export complexity	34.5	103	
6.3.3 High-tech exports, % total trade	0.1	116	
6.3.4 ICT services exports, % total trade	0.3	113	
6.3.5 ISO 9001 quality/bn PPP$ GDP	0.5	119	
Creative outputs	**8.7**	**112**	
7.1 Intangible assets	**16.9**	**94**	
7.1.1 Intangible asset intensity, top 15, %	n/a	n/a	
7.1.2 Trademarks by origin/bn PPP$ GDP	31.4	74	● ◆
7.1.3 Global brand value, top 5,000	0.0	74	○ ◇
7.1.4 Industrial designs by origin/bn PPP$ GDP	2.0	41	● ◆
7.2 Creative goods and services	**0.5**	**[122]**	
7.2.1 Cultural and creative services exports, % total trade	n/a	n/a	
7.2.2 National feature films/mn pop. 15-69	n/a	n/a	
7.2.3 Entertainment and media market/th pop. 15-69	n/a	n/a	
7.2.4 Creative goods exports, % total trade	0.0	111	
7.3 Online creativity	**0.3**	**129**	○ ◇
7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	0.1	125	○
7.3.2 Country-code TLDs/th pop. 15-69	0.1	118	
7.3.3 GitHub commits/mn pop. 15-69	0.6	119	
7.3.4 Mobile app creation/bn PPP$ GDP	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; ◆ an income group strength; ◇ an income group weakness; * an index; † a survey question, ◔ indicates that the economy's data are older than the base year; see appendices for details, including the year of the data, at https://www.wipo.int/gii-ranking. Square brackets [ ] indicate that the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level.

Global Innovation Index 2023



→ Data availability

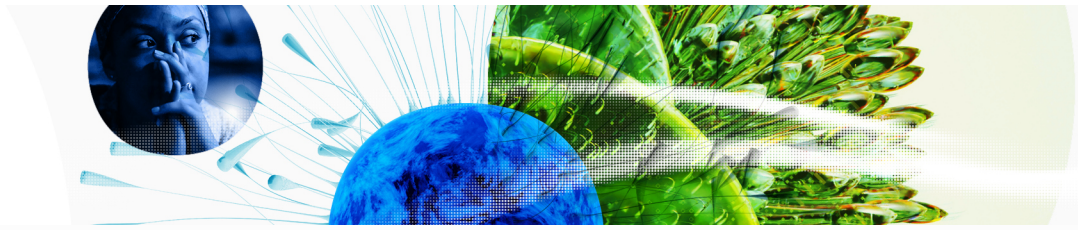
The following tables list indicators that are either missing or outdated for Zambia.

> Zambia has missing data for twenty three indicators and outdated data for nine indicators.

> Missing data for Zambia

Code	Indicator name	Economy Year	Model Year	Source
1.3.2	Entrepreneurship policies and culture	n/a	2022	Global Entrepreneurship Monitor
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	2019	UNESCO Institute for Statistics
2.1.3	School life expectancy, years	n/a	2020	UNESCO Institute for Statistics
2.1.4	PISA scales in reading, maths and science	n/a	2018	OECD, PISA
2.2.1	Tertiary enrolment, % gross	n/a	2020	UNESCO Institute for Statistics
2.2.2	Graduates in science and engineering, %	n/a	2020	UNESCO Institute for Statistics; Eurostat; OECD
2.2.3	Tertiary inbound mobility, %	n/a	2020	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	n/a	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
2.3.2	Gross expenditure on R&D, % GDP	n/a	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
3.2.2	Logistics performance	n/a	2023	World Bank, Logistics Performance Index 2023 (https://lpi.worldbank.org/); and World Bank 2023, Connecting to Compete 2023: Trade Logistics in the Global Economy ÔÇô The Logistics Performance Index and its Indicators.
4.1.1	Finance for startups and scaleups	n/a	2022	Global Entrepreneurship Monitor
4.2.1	Market capitalization, % GDP	n/a	2020	World Federation of Exchanges; World Bank
4.2.2	Venture capital (VC) investors, deals/bn PPP$ GDP	n/a	2022	Refinitiv; International Monetary Fund
5.1.3	GERD performed by business, % GDP	n/a	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.1.4	GERD financed by business, %	n/a	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.2.3	GERD financed by abroad, % GDP	n/a	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT

Global Innovation Index 2023

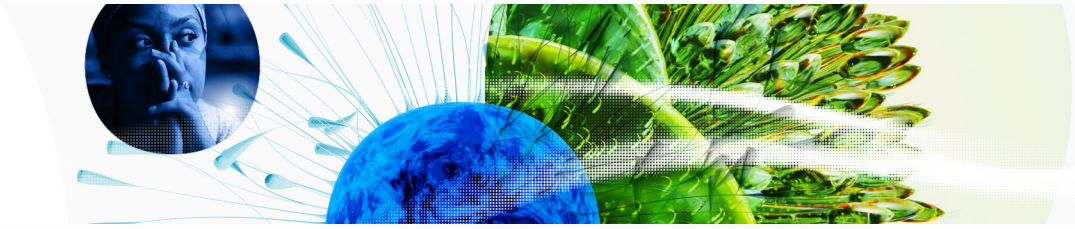


Code	Indicator name	Economy Year	Model Year	Source
5.3.5	Research talent, % in businesses	n/a	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	2021	World Intellectual Property Organization; International Monetary Fund
7.1.1	Intangible asset intensity, top 15, %	n/a	2022	Brand Finance
7.2.1	Cultural and creative services exports, % total trade	n/a	2021	World Trade Organization and United Nations Conference on Trade and Development
7.2.2	National feature films/mn pop. 15-69	n/a	2021	OMDIA; United Nations, World Population Prospects
7.2.3	Entertainment and media market/th pop. 15-69	n/a	2022	PwC, GEMO; United Nations, World Population Prospects; International Monetary Fund
7.3.4	Mobile app creation/bn PPP$ GDP	n/a	2022	data.ia; International Monetary Fund

> Outdated data for Zambia

Code	Indicator name	Economy Year	Model Year	Source
2.1.1	Expenditure on education, % GDP	2020	2021	UNESCO Institute for Statistics
2.1.5	Pupil-teacher ratio, secondary	2014	2020	UNESCO Institute for Statistics
4.3.2	Domestic industry diversification	2015	2020	United Nations Industrial Development Organization
5.1.1	Knowledge-intensive employment, %	2021	2022	International Labour Organization
5.1.5	Females employed w/advanced degrees, %	2021	2022	International Labour Organization
6.1.1	Patents by origin/bn PPP$ GDP	2020	2021	World Intellectual Property Organization; International Monetary Fund
6.2.4	High-tech manufacturing, %	2015	2020	United Nations Industrial Development Organization
7.1.2	Trademarks by origin/bn PPP$ GDP	2020	2021	World Intellectual Property Organization; International Monetary Fund
7.1.4	Industrial designs by origin/bn PPP$ GDP	2020	2021	World Intellectual Property Organization; International Monetary Fund

Global Innovation Index 2023



About the Global Innovation Index

- The Global Innovation Index (GII) is published by the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations.
- Recognizing that innovation is a key driver of economic development, the GII aims to provide an innovation ranking and rich analysis referencing around 130 economies. Over the last decade, the GII has established itself as both a leading reference on innovation and a "tool for action" for economies that incorporate the GII into their innovation agendas.

Source: Global Innovation Index Database, WIPO, 2023.

The Index is a ranking of the innovation capabilities and results of world economies. It measures innovation based on criteria that include institutions, human capital and research, infrastructure, credit, investment, linkages; the creation, absorption and diffusion of knowledge; and creative outputs.

The GII has two sub-indices: the Innovation Input Sub-Index and the Innovation Output Sub-Index, and seven pillars, each consisting of three sub-pillars.