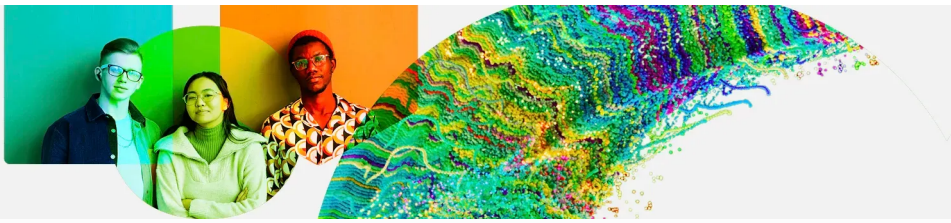
Global Innovation Index 2024



Rwanda ranking in the Global Innovation Index 2024

Rwanda ranks 104th among the 133 economies featured in the GII 2024.

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.

Rwanda ranks 1st among the 10 low-income group economies.

Rwanda ranks 9th among the 27 economies in Sub-Saharan Africa.

Rwanda GII Ranking (2020-2024)

The table shows the rankings of Rwanda 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 Rwanda in the GII 2024 is between ranks 94 and 112.

Year	GII Position	Innovation Inputs	Innovation Outputs
2020	91st	79th	112nd
2021	102nd	91st	108th
2022	105th	91st	123rd
2023	103rd	85th	113rd
2024	104th	81st	116th

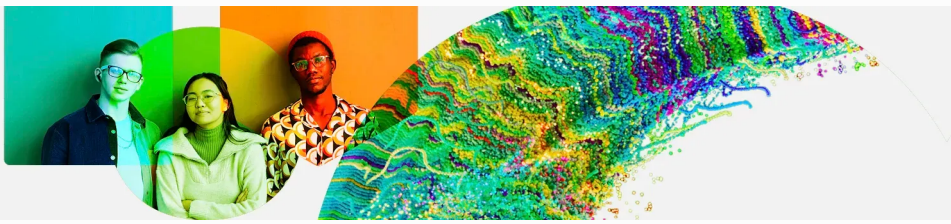
Rwanda performs worse in innovation outputs than innovation inputs in 2024.

This year **Rwanda ranks 81st in innovation inputs.** This position is higher than last year.

Rwanda ranks 116th in innovation outputs. This position is lower than last year.

Rwanda has no clusters in the top 100 S&T clusters of the Global Innovation Index.

Global Innovation Index 2024



> Global Innovation Tracker

The Global Innovation Tracker 2024 shows what is the current state of innovation in Rwanda, how rapidly is technology being embraced and what are the resulting societal impacts.

For Rwanda, 5 indicators have improved in the short-term and 1 indicator has worsened.

Science and innovation investment

Scientific publications	R&D investments	Venture capital		International patent filings
		Deal numbers	Deal values	
▼ -11% 2022 - 2023	▲ 13% 2016 - 2019	▲ 75% 2022 - 2023	n/a	n/a
▲ 14.6% 2013 - 2023	n/a	▲ 3.4% 2013 - 2023	▲ 24.5% 2013 - 2023	▼ -100% 2013 - 2023

Technology adoption

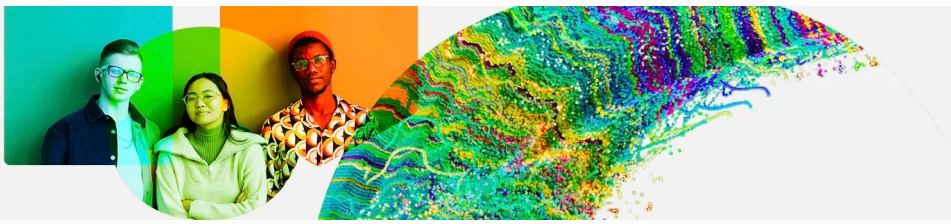
Safe sanitation	Connectivity		Robots	Electric vehicles
	Fixed broadband	5G		
n/a	▲ 46.3% 2021 - 2022	n/a	n/a	n/a
n/a	▲ 21.2% 2012 - 2022		n/a	n/a
n/a	0.3 per 100 inhabitants in 2022	n/a		n/a

Socioeconomic impact

Labor productivity	Life expectancy	Temperature change
▲ 2.5% 2022 - 2023	▲ 1.6% 2021 - 2022	n/a
▲ 4.6% 2013 - 2023	▲ 0.5% 2012 - 2022	n/a
9,413 USD in 2023	67.1 years in 2022	

Notes: Not all indicators of the Global Innovation Tracker are used to calculate the Global Innovation Index. Long-term annual growth refers to the compound annual growth rate (CAGR) over the indicated period. For each variable, a one-year growth rate is set for the short run, and ten-year CAGR is set for the long run; time windows might differ when gaps exist in data availability. The end period corresponds to the most recent available observation, which may differ among countries. Temperature change is an exception: it indicates the change in degrees Celsius with respect to the average temperature in the country from 1951–1980. Figures are rounded.

Global Innovation Index 2024

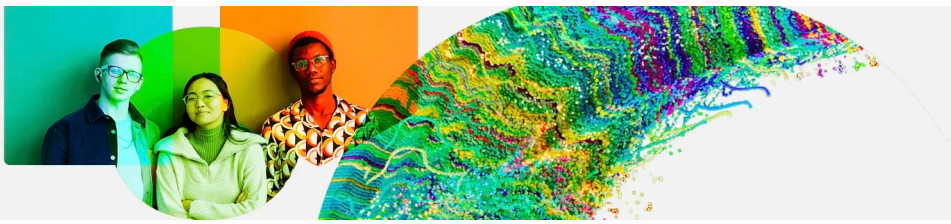


Expected vs. observed innovation performance

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, Rwanda is performing above expectations for its level of development.

> Innovation overperformers relative to their economic development



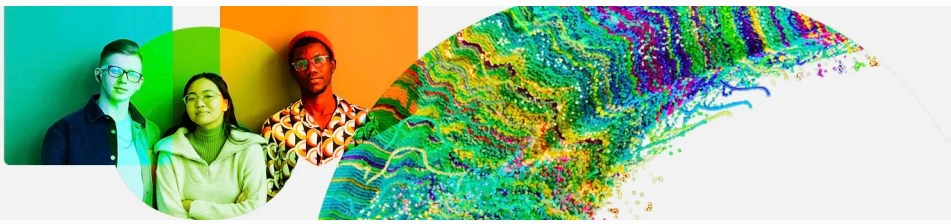
Effectively translating innovation investments into innovation outputs

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.

Rwanda produces less innovation outputs relative to its level of innovation investments.

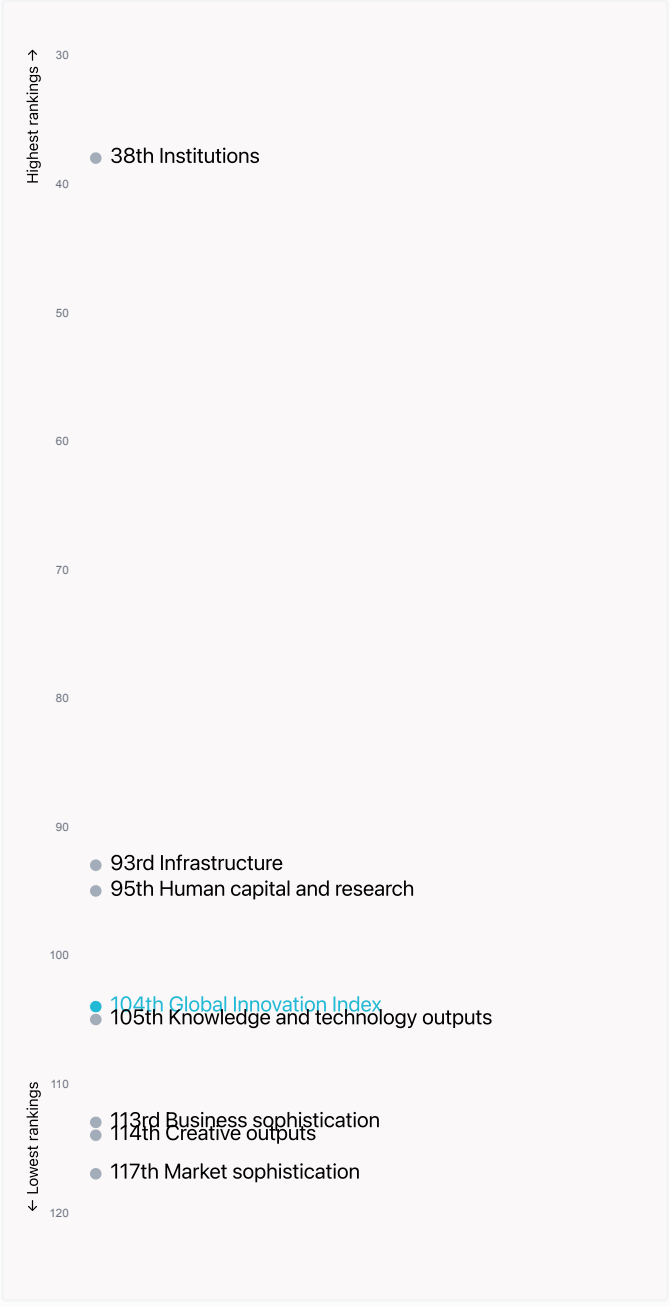
> Relationship between innovation inputs and outputs

Global Innovation Index 2024



Overview of Rwanda's rankings in the seven areas of the GII in 2024

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



Highest rankings

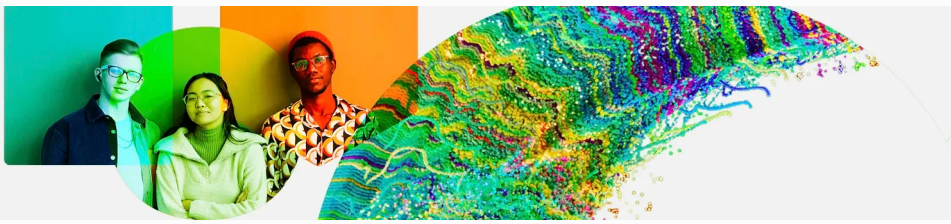
Rwanda ranks highest in Institutions (38th), Infrastructure (93rd) and Human capital and research (95th).

Lowest rankings

Rwanda ranks lowest in Market sophistication (117th), Creative outputs (114th) and Business sophistication (113rd).

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

Global Innovation Index 2024



Benchmark of Rwanda against other economy groupings for each of the seven areas of the GII Index

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

Low-Income economies

Rwanda performs above the low-income group average in Institutions, Human capital and research, Infrastructure, Market sophistication, Business sophistication, Knowledge and technology outputs.

Sub-Saharan Africa

Rwanda performs above the regional average in Institutions, Human capital and research, Infrastructure, Knowledge and technology outputs.

Institutions

- Top 10 | Score: 80.81
- Rwanda | Score: 62.10
- Sub-Saharan Africa | Score: 37.83
- Low income | Score: 31.64

Human capital and research

- Top 10 | Score: 61.30
- Rwanda | Score: 24.42
- Sub-Saharan Africa | Score: 17.86
- Low income | Score: 15.48

Infrastructure

- Top 10 | Score: 58.57
- Rwanda | Score: 30.63
- Sub-Saharan Africa | Score: 25.40
- Low income | Score: 20.65

Market sophistication

- Top 10 | Score: 62.12
- Sub-Saharan Africa | Score: 18.79
- Rwanda | Score: 16.05
- Low income | Score: 15.81

Business sophistication

- Top 10 | Score: 63.64
- Sub-Saharan Africa | Score: 18.73
- Rwanda | Score: 18.17
- Low income | Score: 15.07

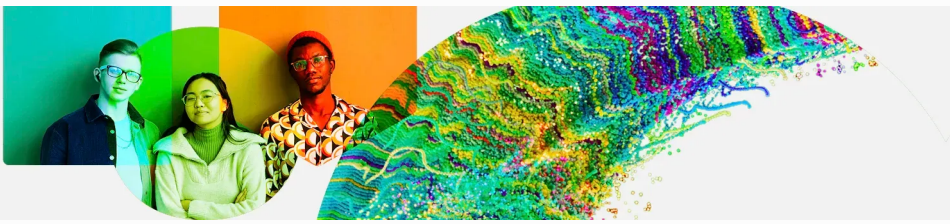
Knowledge and technology outputs

- Top 10 | Score: 57.29
- Rwanda | Score: 11.02
- Sub-Saharan Africa | Score: 10.99
- Low income | Score: 10.02

Creative outputs

- Top 10 | Score: 56.54
- Sub-Saharan Africa | Score: 10.35
- Low income | Score: 7.56
- Rwanda | Score: 7.19

Global Innovation Index 2024



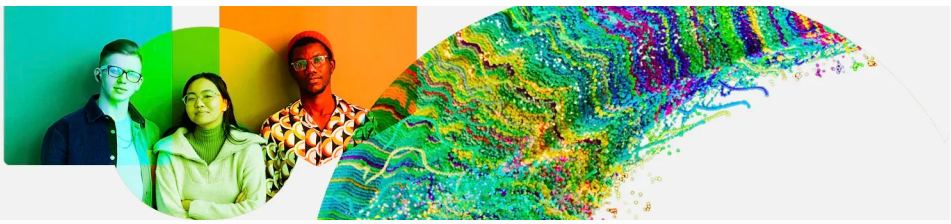
Innovation strengths and weaknesses in Rwanda

The table below gives an overview of the indicator strengths and weaknesses of Rwanda in the GII 2024.

Rwanda's main innovation strengths are **Labor productivity growth, %** (rank 5), **Government funding/pupil, secondary, % GDP/cap** (rank 8) and **Policy stability for doing business†** (rank 8).

Strengths			Weaknesses		
Rank	Code	Indicator name	Rank	Code	Indicator name
5	6.2.1	Labor productivity growth, %	129	4.3.1	Applied tariff rate, weighted avg., %
8	2.1.2	Government funding/pupil, secondary, % GDP/cap	125	3.2.1	Electricity output, GWh/mn pop.
8	1.3.1	Policy stability for doing business†	121	2.2.1	Tertiary enrolment, % gross
16	2.2.2	Graduates in science and engineering, %	102	5.2.5	Patent families/bn PPP$ GDP
26	4.2.3	VC recipients, deals/bn PPP$ GDP	99	6.1.2	PCT patents by origin/bn PPP$ GDP
30	5.2.1	Public Research-Industry co-publications, %	94	5.1.4	GERD financed by business, %
37	3.3.2	Low-carbon energy use, %	75	7.1.3	Global brand value, top 5,000, % GDP
40	5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	75	2.3.4	QS university ranking, top 3*
41	3.1.3	Government's online service*	49	6.2.2	Unicorn valuation, % GDP
47	5.2.3	State of cluster development†	41	2.3.3	Global corporate R&D investors, top 3, mn USD

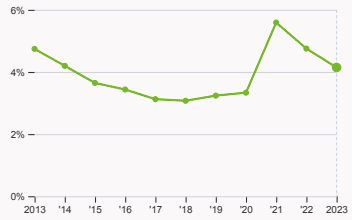
Global Innovation Index 2024



Rwanda's innovation system

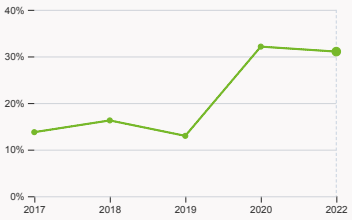
As far as practicable, the plots below present unscaled indicator data.

Innovation inputs in Rwanda



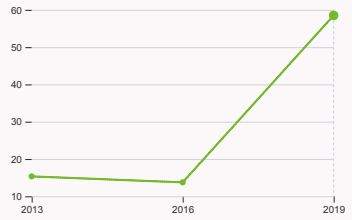
2.1.1 **Expenditure on education**

was equal to 4.14 % GDP in 2023, down by 0.61 percentage points from the year prior – and equivalent to an indicator rank of 65.



2.2.2 **Graduates in science and engineering**

was equal to 31.03 % of total graduates in 2022, down by 1.07 percentage points from the year prior – and equivalent to an indicator rank of 16.

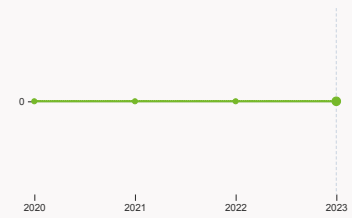


2.3.1 **Researchers**

was equal to 58.5 FTE per million population in 2019, up by 326.18% from the year prior – and equivalent to an indicator rank of 98.

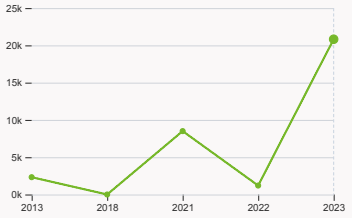
2.3.2 **Gross expenditure on R&D**

was equal to 0.76 % GDP in 2019, up by 0.11 percentage points from the year prior – and equivalent to an indicator rank of 49.



2.3.4 **QS university ranking**

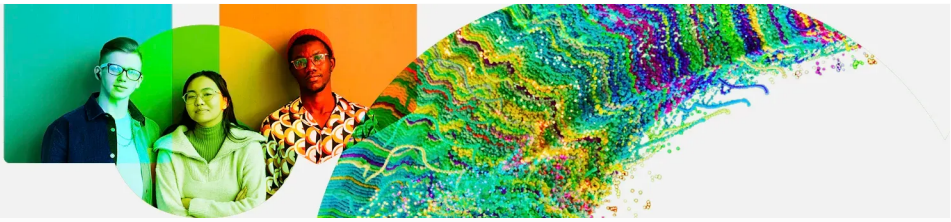
was equal to an average score of 0 for the top three universities in 2023 with no change from the year prior – and equivalent to an indicator rank of 75.



4.2.4 **VC received, value**

was equal to 20.82 thousand USD in 2023, up by 1635% from the year prior – and equivalent to an indicator rank of 58.

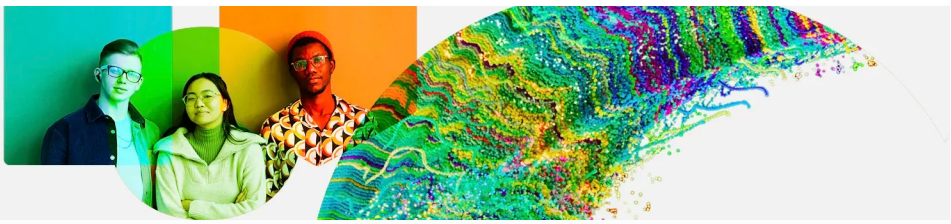
Global Innovation Index 2024



4.3.2 **Domestic industry diversification**
was equal to an index score of 0.24 in 2021, down by 4.48% from the year prior – and equivalent to an indicator rank of 90.

5.1.1 **Knowledge-intensive employment**
was equal to 6.77 % in 2022, up by 0.24 percentage points from the year prior – and equivalent to an indicator rank of 116.

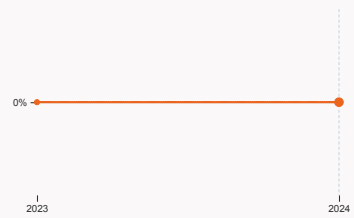
Global Innovation Index 2024



Innovation outputs in Rwanda

6.1.1 Patents by origin

was equal to 8 patents in 2022, down by 46.67% from the year prior – and equivalent to an indicator rank of 97.

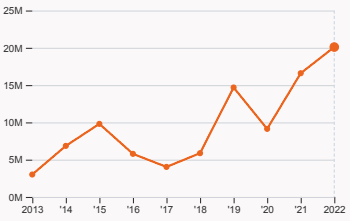


6.2.2 Unicorn valuation

was equal to 0 % GDP in 2024 with no change from the year prior – and equivalent to an indicator rank of 49.

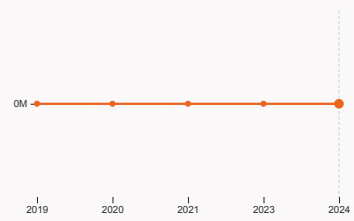
6.2.4 High-tech manufacturing

was equal to 8.26 % of total manufacturing output in 2021, up by 0.92 percentage points from the year prior – and equivalent to an indicator rank of 92.



6.3.3 High-tech exports

was equal to 20.1 million USD in 2022, up by 21.16% from the year prior – and equivalent to an indicator rank of 90.



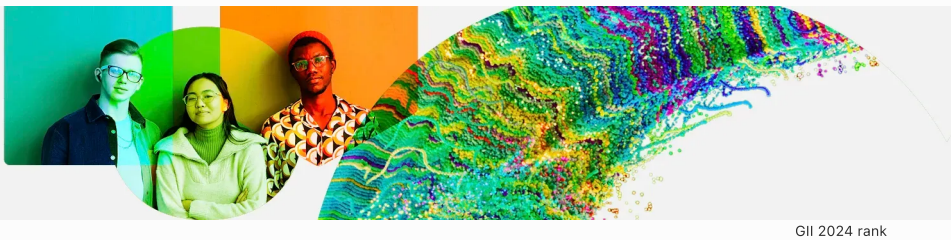
7.1.3 Global brand value

was equal to 0 million USD for the brands in the top 5,000 in 2024 with no change from the year prior – and equivalent to an indicator rank of 75.

7.3.3 Mobile app creation

was equal to 213.32 thousand global downloads of mobile apps in 2023, up by 41.1% from the year prior – and equivalent to an indicator rank of 109.

Global Innovation Index 2024



Rwanda

GII 2024 rank **104**

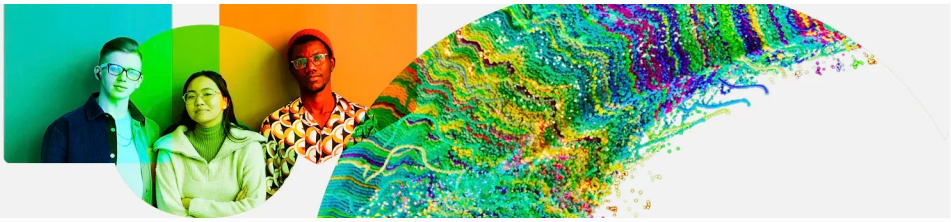
Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
116	81	Low	SSA	14.0	42.3	3,137

	Score / Value	Rank
Institutions	62.1	38
1.1 Institutional environment	58.7	54
1.1.1 Operational stability for businesses*	67.3	48
1.1.2 Government effectiveness*	50.1	55
1.2 Regulatory environment	47.1	60
1.2.1 Regulatory quality*	46.1	63
1.2.2 Rule of law*	48	58
1.3 Business environment	80.5	[5]
1.3.1 Policy stability for doing business†	80.5	8
1.3.2 Entrepreneurship policies and culture†	n/a	n/a
Human capital and research	24.4	95
2.1 Education	42	90
2.1.1 Expenditure on education, % GDP	4.1	65
2.1.2 Government funding/pupil, secondary, % GDP/cap	30.3	8
2.1.3 School life expectancy, years	11.4	99
2.1.4 PISA scales in reading, maths and science	n/a	n/a
2.1.5 Pupil–teacher ratio, secondary	27.6	116
2.2 Tertiary education	28.1	81
2.2.1 Tertiary enrolment, % gross	7	121
2.2.2 Graduates in science and engineering, %	31	16
2.2.3 Tertiary inbound mobility, %	4.5	54
2.3 Research and development (R&D)	3.2	86
2.3.1 Researchers, FTE/mn pop.	58.5	98
2.3.2 Gross expenditure on R&D, % GDP	0.8	49
2.3.3 Global corporate R&D investors, top 3, mn USD	0	41
2.3.4 QS university ranking, top 3*	0	75
Infrastructure	30.6	93
3.1 Information and communication technologies (ICTs)	54.5	96
3.1.1 ICT access*	43	114
3.1.2 ICT use*	35.2	113
3.1.3 Government's online service*	77.2	41
3.1.4 E-participation*	62.8	53
3.2 General infrastructure	22.1	93
3.2.1 Electricity output, GWh/mn pop.	72.8	125
3.2.2 Logistics performance*	31.8	71
3.2.3 Gross capital formation, % GDP	25	52
3.3 Ecological sustainability	15.3	91
3.3.1 GDP/unit of energy use	5.9	110
3.3.2 Low-carbon energy use, %	29.2	37
3.3.3 ISO 14001 environment/bn PPP$ GDP	0.2	117
Market sophistication	16	117
4.1 Credit	8.3	117
4.1.1 Finance for startups and scaleups†	n/a	n/a
4.1.2 Domestic credit to private sector, % GDP	22.9	110
4.1.3 Loans from microfinance institutions, % GDP	1	31
4.2 Investment	15.3	46
4.2.1 Market capitalization, % GDP	30.8	46
4.2.2 Venture capital (VC) investors, deals/bn PPP$ GDP	0.04	74
4.2.3 VC recipients, deals/bn PPP$ GDP	0.1	26
4.2.4 VC received, value, % GDP	0.0008	58
4.3 Trade, diversification and market scale	24.4	119
4.3.1 Applied tariff rate, weighted avg., %	11.6	129
4.3.2 Domestic industry diversification	64	90
4.3.3 Domestic market scale, bn PPP$	42.3	120

	Score / Value	Rank
Business sophistication	18.2	113
5.1 Knowledge workers	10.3	119
5.1.1 Knowledge-intensive employment, %	6.8	116
5.1.2 Firms offering formal training, %	27.4	62
5.1.3 GERD performed by business, % GDP	0.04	73
5.1.4 GERD financed by business, %	0.6	94
5.1.5 Females employed w/advanced degrees, %	3.1	104
5.2 Innovation linkages	28.6	53
5.2.1 Public Research-Industry co-publications, %	2.5	30
5.2.2 University-industry R&D collaboration†	49.7	54
5.2.3 State of cluster development†	55.8	47
5.2.4 Joint venture/strategic alliance deals/bn PPP$ GDP	0.03	40
5.2.5 Patent families/bn PPP$ GDP	0	102
5.3 Knowledge absorption	15.5	125
5.3.1 Intellectual property payments, % total trade	0.007	116
5.3.2 High-tech imports, % total trade	8	71
5.3.3 ICT services imports, % total trade	0.6	105
5.3.4 FDI net inflows, % GDP	2.1	73
5.3.5 Research talent, % in businesses	5.6	71
Knowledge and technology outputs	11	105
6.1 Knowledge creation	7.6	95
6.1.1 Patents by origin/bn PPP$ GDP	0.2	97
6.1.2 PCT patents by origin/bn PPP$ GDP	0	99
6.1.3 Utility models by origin/bn PPP$ GDP	0.2	39
6.1.4 Scientific and technical articles/bn PPP$ GDP	11.3	65
6.1.5 Citable documents H-index	3.4	117
6.2 Knowledge impact	23.2	76
6.2.1 Labor productivity growth, %	4.5	5
6.2.2 Unicorn valuation, % GDP	0	49
6.2.3 Software spending, % GDP	0.04	112
6.2.4 High-tech manufacturing, %	8.3	92
6.3 Knowledge diffusion	2.3	128
6.3.1 Intellectual property receipts, % total trade	0.02	90
6.3.2 Production and export complexity	n/a	n/a
6.3.3 High-tech exports, % total trade	0.5	90
6.3.4 ICT services exports, % total trade	0.7	94
6.3.5 ISO 9001 quality/bn PPP$ GDP	0.5	123
Creative outputs	7.2	114
7.1 Intangible assets	5.1	112
7.1.1 Intangible asset intensity, top 15, %	n/a	n/a
7.1.2 Trademarks by origin/bn PPP$ GDP	20	86
7.1.3 Global brand value, top 5,000, % GDP	0	75
7.1.4 Industrial designs by origin/bn PPP$ GDP	0.1	109
7.2 Creative goods and services	1.6	[113]
7.2.1 Cultural and creative services exports, % total trade	0.02	103
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	0.2	77
7.3 Online creativity	17	108
7.3.1 Top-level domains (TLDs)/th pop. 15–69	0.2	122
7.3.2 GitHub commits/mn pop. 15–69	4.8	76
7.3.3 Mobile app creation/bn PPP$ GDP	45.9	109

NOTES: ● indicates a strength; ○ a weakness; ◆ an income group strength; ◇ an income group weakness; * an index; † a survey question, 🕒 that the economy's data is outdated. Square brackets [ ] indicate the the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level; n/a represents missing values; a dash - indicates an indicator which is not relevant to this economy and thus not considered for DMC thresholds.

Global Innovation Index 2024



Data availability

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

Rwanda has missing data for seven indicators and outdated data for seven indicators.

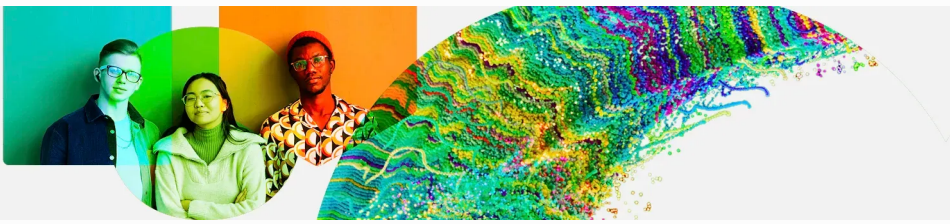
Missing data for Rwanda

Code	Indicator name	Economy Year	Model Year	Source
1.3.2	Entrepreneurship policies and culture†	n/a	2023	Global Entrepreneurship Monitor
2.1.4	PISA scales in reading, maths and science	n/a	2022	OECD, PISA
4.1.1	Finance for startups and scaleups†	n/a	2023	Global Entrepreneurship Monitor
6.3.2	Production and export complexity	n/a	2021	Harvard University, Growth Lab
7.1.1	Intangible asset intensity, top 15, %	n/a	2023	Brand Finance
7.2.2	National feature films/mn pop. 15–69	n/a	2022	OMDIA; United Nations, World Population Prospects
7.2.3	Entertainment and media market/th pop. 15–69	n/a	2023	PwC, GEMO; United Nations, World Population Prospects; International Monetary Fund

Outdated data for Rwanda

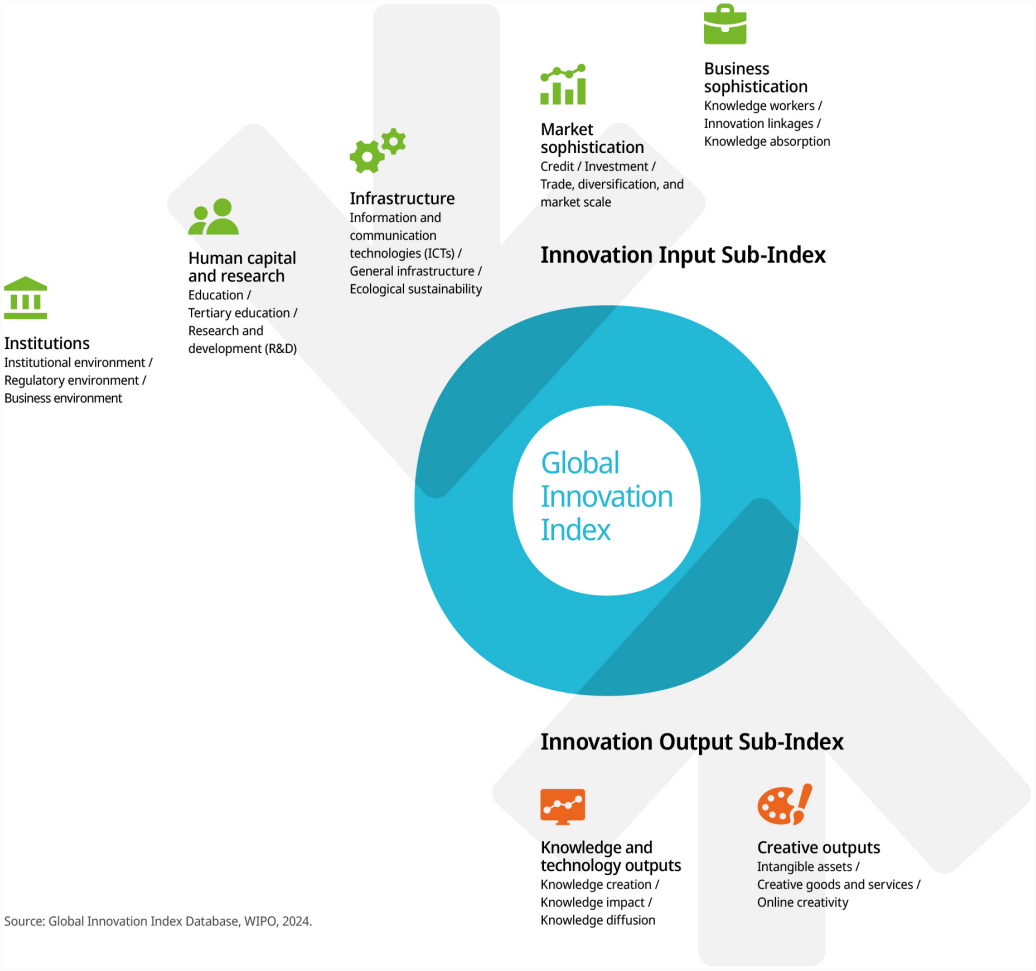
Code	Indicator name	Economy Year	Model Year	Source
2.3.1	Researchers, FTE/mn pop.	2019	2022	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
2.3.2	Gross expenditure on R&D, % GDP	2019	2022	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
3.2.1	Electricity output, GWh/mn pop.	2021	2022	International Energy Agency
5.1.3	GERD performed by business, % GDP	2016	2022	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.1.4	GERD financed by business, %	2016	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.1.5	Females employed w/advanced degrees, %	2022	2023	International Labour Organization
5.3.5	Research talent, % in businesses	2016	2022	UNESCO Institute for Statistics; Eurostat; OECD; RICYT

Global Innovation Index 2024



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, 2024.

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.