Global Innovation Index 2021

RWANDA

102nd Rwanda ranks 102nd among the 132 economies featured in the GII 2021.

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.

The following table shows the rankings of Rwanda over the past three years, noting that 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 2021 is between ranks 99 and 110.

Rankings for Rwanda (2019–2021)

	GII	Innovation inputs	Innovation outputs
2021	102	91	108
2020	91	79	112
2019	94	65	123

- Rwanda performs better in innovation inputs than innovation outputs in 2021.
- This year Rwanda ranks 91st in innovation inputs, lower than both 2020 and 2019.
- As for innovation outputs, Rwanda ranks 108th. This position is higher than both 2020 and 2019.

1st Rwanda ranks 1st among the 13 low-income group economies.

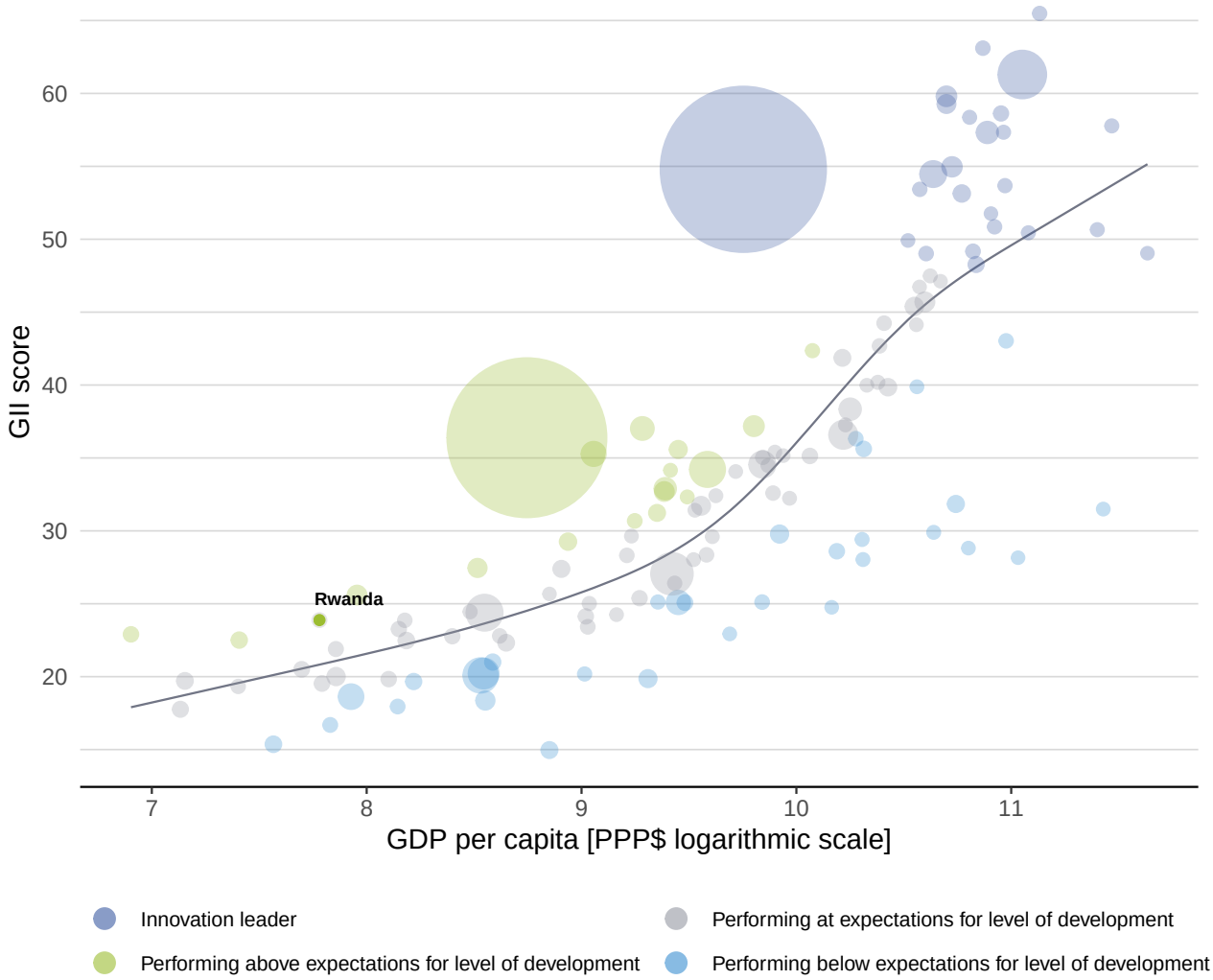
7th Rwanda ranks 7th among the 27 economies in Sub-Saharan Africa.

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's performance is above expectations for its level of development.

The positive relationship between innovation and development

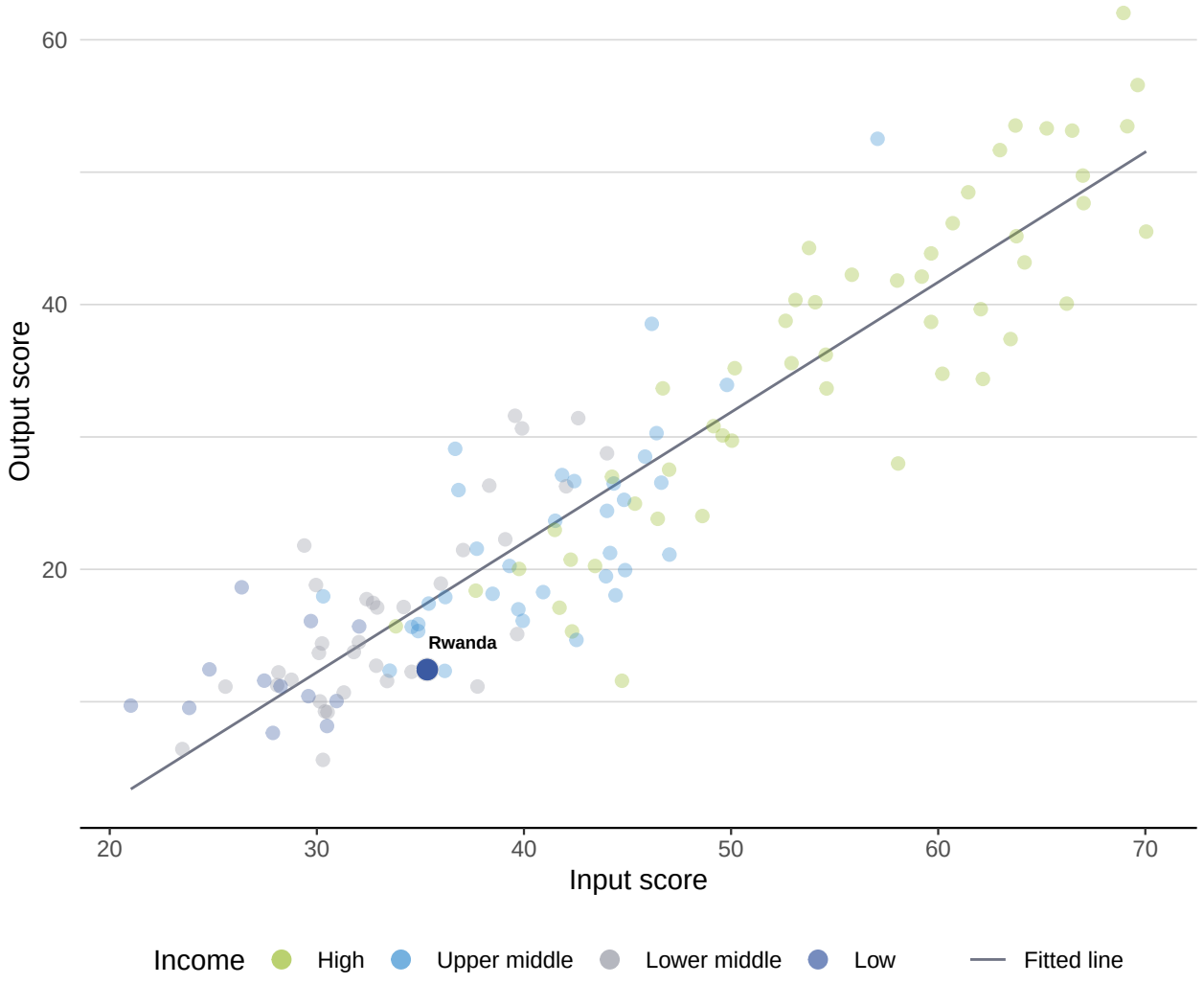


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

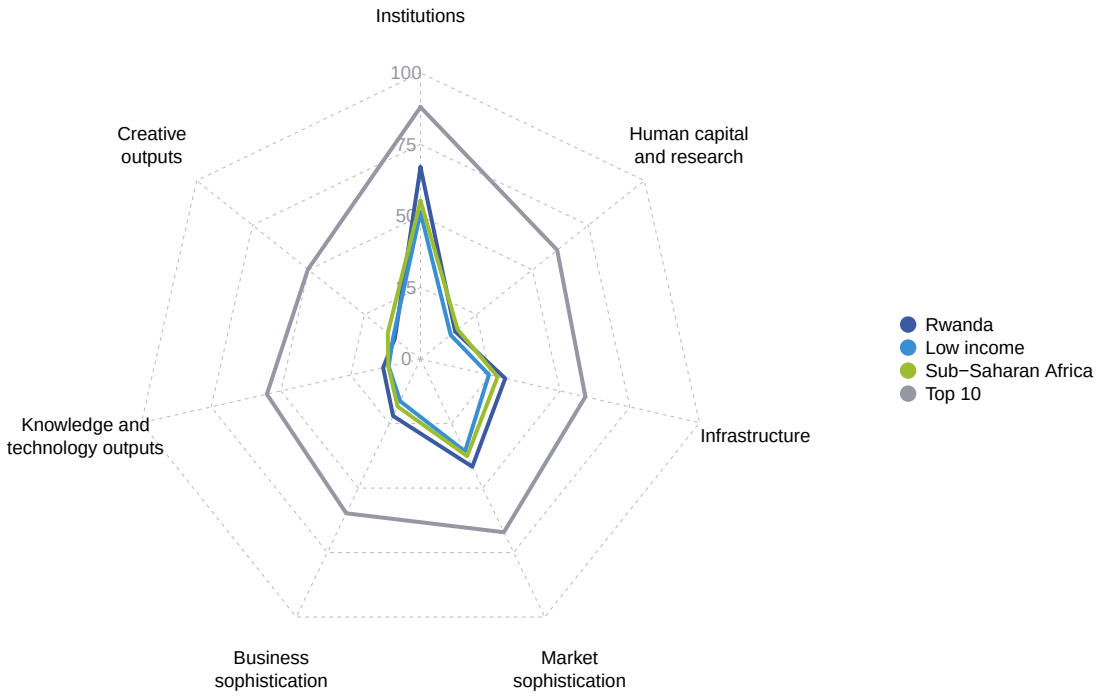
Rwanda produces less innovation outputs relative to its level of innovation investments.

Innovation input to output performance



BENCHMARKING AGAINST OTHER LOW-INCOME GROUP ECONOMIES AND SUB-SAHARAN AFRICA

The seven GII pillar scores for Rwanda



Low-income group economies

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

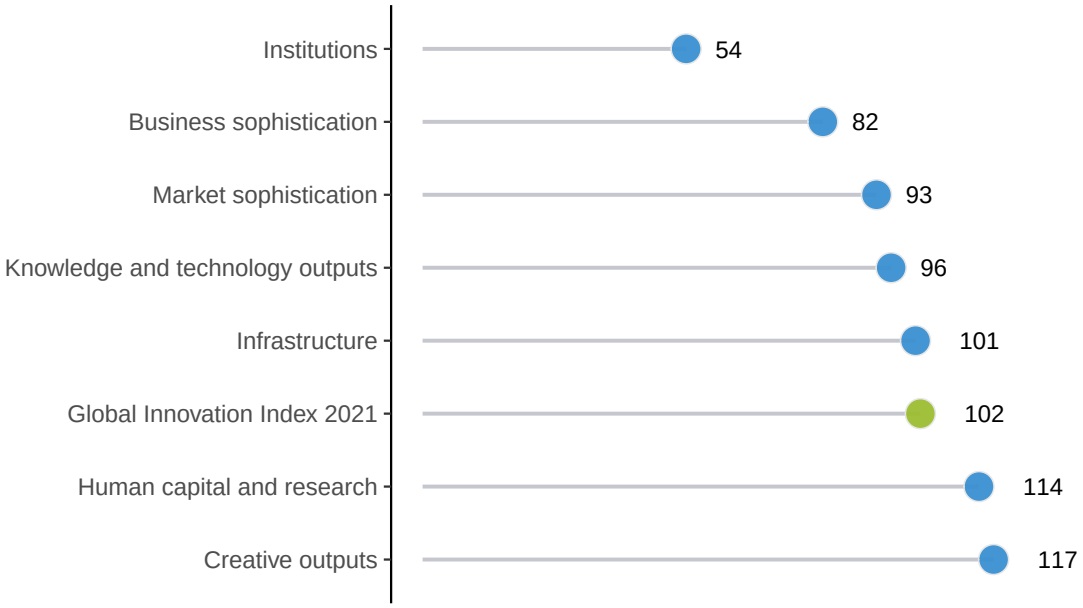
Sub-Saharan Africa

Rwanda performs above the regional average in five pillars, namely: Institutions; Infrastructure; Market sophistication; Business sophistication; and, Knowledge and technology outputs.

OVERVIEW OF RANKINGS IN THE SEVEN GII 2021 AREAS

Rwanda performs best in Institutions and its weakest performance is in Creative outputs.

The seven GII pillar ranks for Rwanda



Note: The highest possible ranking in each pillar is one.

INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the strengths and weaknesses of Rwanda in the GII 2021.

Strengths and weaknesses for Rwanda

Strengths			Weaknesses		
Code	**Indicator name**	**Rank**	**Code**	**Indicator name**	**Rank**
1.1.1	Political and operational stability	40	2.2.1	Tertiary enrolment, % gross	121
1.3	Business environment	48	2.3.1	Researchers, FTE/mn pop.	107
1.3.1	Ease of starting a business	33	2.3.3	Global corporate R&D investors, top 3, mn US$	41
2.1.2	Government funding/pupil, secondary, % GDP/cap	38	2.3.4	QS university ranking, top 3	74
4.1	Credit	14	3.1.1	ICT access	123
4.1.1	Ease of getting credit	4	3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	131
4.1.3	Microfinance gross loans, % GDP	1	4.3	Trade, diversification, and market scale	125
4.2.4	Venture capital recipients, deals/bn PPP$ GDP	28	4.3.2	Domestic industry diversification	109
5.2	Innovation linkages	31	5.1.4	GERD financed by business, %	96
5.2.3	GERD financed by abroad, % GDP	18	6.1.2	PCT patents by origin/bn PPP$ GDP	98
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	26	7.1.2	Global brand value, top 5,000, % GDP	80
5.3.4	FDI net inflows, % GDP	39			
6.2.1	Labor productivity growth, %	4			

Rwanda

GII 2021 rank
102

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$	GII 2020 rank
108	91	Low	SSF	13.0	30.3	2,393	91

		Score/ Value	Rank	
Institutions		**67.0**	**54**	◆
1.1	**Political environment**	**61.5**	**55**	◆
1.1.1	Political and operational stability*	75.0	40	● ◆
1.1.2	Government effectiveness*	54.8	58	◆
1.2	**Regulatory environment**	**64.4**	**67**	
1.2.1	Regulatory quality*	45.5	66	◆
1.2.2	Rule of law*	48.7	59	◆
1.2.3	Cost of redundancy dismissal	17.3	68	
1.3	**Business environment**	**75.2**	**48**	● ◆
1.3.1	Ease of starting a business*	93.2	33	● ◆
1.3.2	Ease of resolving insolvency*	57.2	57	◆
Human capital and research		**15.5**	**114**	
2.1	**Education**	**35.6**	**104**	
2.1.1	Expenditure on education, % GDP	3.1	96	
2.1.2	Government funding/pupil, secondary, % GDP/cap	21.4	38	●
2.1.3	School life expectancy, years	11.2	99	
2.1.4	PISA scales in reading, maths and science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	20.1	95	
2.2	**Tertiary education**	**7.6**	**117**	
2.2.1	Tertiary enrolment, % gross	6.2	121	○
2.2.2	Graduates in science and engineering, %	13.0	100	
2.2.3	Tertiary inbound mobility, %	3.6	59	
2.3	**Research and development (R&D)**	**3.2**	**85**	◆
2.3.1	Researchers, FTE/mn pop.	13.9	107	○ ◇
2.3.2	Gross expenditure on R&D, % GDP	0.6	53	◆
2.3.3	Global corporate R&D investors, top 3, mn US$	0.0	41	○ ◇
2.3.4	QS university ranking, top 3*	0.0	74	○ ◇
Infrastructure		**30.4**	**101**	
3.1	**Information and communication technologies (ICTs)**	**43.6**	**101**	◆
3.1.1	ICT access*	28.3	123	○
3.1.2	ICT use*	21.4	113	◆
3.1.3	Government's online service*	61.8	85	◆
3.1.4	E-participation*	63.1	82	◆
3.2	**General infrastructure**	**30.5**	**60**	
3.2.1	Electricity output, GWh/mn pop.	n/a	n/a	
3.2.2	Logistics performance*	43.1	56	◆
3.2.3	Gross capital formation, % GDP	20.8	83	
3.3	**Ecological sustainability**	**17.0**	**115**	
3.3.1	GDP/unit of energy use	n/a	n/a	
3.3.2	Environmental performance*	33.8	107	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.1	131	○
Market sophistication		**41.7**	**93**	
4.1	**Credit**	**60.7**	**14**	● ◆
4.1.1	Ease of getting credit*	95.0	4	● ◆
4.1.2	Domestic credit to private sector, % GDP	21.4	112	
4.1.3	Microfinance gross loans, % GDP	6.7	1	● ◆
4.2	**Investment**	**24.5**	**87**	
4.2.1	Ease of protecting minority investors*	44.0	98	
4.2.2	Market capitalization, % GDP	31.0	45	
4.2.3	Venture capital investors, deals/bn PPP$ GDP	n/a	n/a	
4.2.4	Venture capital recipients, deals/bn PPP$ GDP	0.1	28	●
4.3	**Trade, diversification, and market scale**	**39.9**	**125**	○
4.3.1	Applied tariff rate, weighted avg., %	9.6	114	
4.3.2	Domestic industry diversification	43.6	109	○ ◇
4.3.3	Domestic market scale, bn PPP$	30.3	122	

		Score/ Value	Rank	
Business sophistication		**22.0**	**82**	◆
5.1	**Knowledge workers**	**12.9**	**117**	
5.1.1	Knowledge-intensive employment, %	8.9	112	
5.1.2	Firms offering formal training, %	35.9	38	◆
5.1.3	GERD performed by business, % GDP	0.0	75	◆
5.1.4	GERD financed by business, %	0.6	96	○
5.1.5	Females employed w/advanced degrees, %	4.0	98	◆
5.2	**Innovation linkages**	**32.4**	**31**	● ◆
5.2.1	University-industry R&D collaboration†	33.0	101	
5.2.2	State of cluster development and depth†	46.3	66	◆
5.2.3	GERD financed by abroad, % GDP	0.2	18	● ◆
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	0.1	26	● ◆
5.2.5	Patent families/bn PPP$ GDP	n/a	n/a	
5.3	**Knowledge absorption**	**20.8**	**89**	
5.3.1	Intellectual property payments, % total trade	n/a	n/a	
5.3.2	High-tech imports, % total trade	8.5	55	
5.3.3	ICT services imports, % total trade	0.5	101	
5.3.4	FDI net inflows, % GDP	3.5	39	●
5.3.5	Research talent, % in businesses	5.6	70	
Knowledge and technology outputs		**13.4**	**96**	
6.1	**Knowledge creation**	**8.0**	**88**	
6.1.1	Patents by origin/bn PPP$ GDP	0.2	93	
6.1.2	PCT patents by origin/bn PPP$ GDP	0.0	98	○ ◇
6.1.3	Utility models by origin/bn PPP$ GDP	0.3	41	
6.1.4	Scientific and technical articles/bn PPP$ GDP	14.1	63	
6.1.5	Citable documents H-index	4.0	114	
6.2	**Knowledge impact**	**28.2**	**70**	◆
6.2.1	Labor productivity growth, %	5.8	4	● ◆
6.2.2	New businesses/th pop. 15–64	1.5	67	◆
6.2.3	Software spending, % GDP	0.0	101	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.5	119	
6.2.5	High-tech manufacturing, %	n/a	n/a	
6.3	**Knowledge diffusion**	**4.0**	**[123]**	
6.3.1	Intellectual property receipts, % total trade	n/a	n/a	
6.3.2	Production and export complexity	n/a	n/a	
6.3.3	High-tech exports, % total trade	0.5	91	◆
6.3.4	ICT services exports, % total trade	0.7	91	
Creative outputs		**11.5**	**117**	
7.1	**Intangible assets**	**16.7**	**111**	
7.1.1	Trademarks by origin/bn PPP$ GDP	10.8	110	
7.1.2	Global brand value, top 5,000, % GDP	0.0	80	○ ◇
7.1.3	Industrial designs by origin/bn PPP$ GDP	0.1	106	
7.1.4	ICTs and organizational model creation†	51.0	78	
7.2	**Creative goods and services**	**3.3**	**[110]**	
7.2.1	Cultural and creative services exports, % total trade	0.0	101	
7.2.2	National feature films/mn pop. 15–69	3.2	59	◆
7.2.3	Entertainment and media market/th pop. 15–69	n/a	n/a	
7.2.4	Printing and other media, % manufacturing	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.1	100	
7.3	**Online creativity**	**9.1**	**100**	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.1	121	
7.3.2	Country-code TLDs/th pop. 15–69	0.1	114	
7.3.3	Wikipedia edits/mn pop. 15–69	29.9	105	
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 Appendix IV for details, including the year of the data, at http://globalinnovationindex.org. Square brackets [ ] indicate that the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level.

DATA AVAILABILITY

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

Missing data for Rwanda

Code	Indicator name	Economy year	Model year	Source
2.1.4	PISA scales in reading, maths and science	n/a	2018	OECD Programme for International Student Assessment (PISA)
3.2.1	Electricity output, GWh/mn pop.	n/a	2018	International Energy Agency
3.3.1	GDP/unit of energy use	n/a	2018	International Energy Agency
4.2.3	Venture capital investors, deals/bn PPP$ GDP	n/a	2020	Refinitiv Eikon
5.2.5	Patent families/bn PPP$ GDP	n/a	2017	World Intellectual Property Organization
5.3.1	Intellectual property payments, % total trade	n/a	2019	World Trade Organization
6.2.5	High-tech manufacturing, %	n/a	2018	United Nations Industrial Development Organization
6.3.1	Intellectual property receipts, % total trade	n/a	2019	World Trade Organization
6.3.2	Production and export complexity	n/a	2018	Growth Lab, Harvard University
7.2.3	Entertainment and media market/th pop. 15–69	n/a	2020	PwC
7.2.4	Printing and other media, % manufacturing	n/a	2018	United Nations Industrial Development Organization
7.3.4	Mobile app creation/bn PPP$ GDP	n/a	2020	App Annie

Outdated data for Rwanda

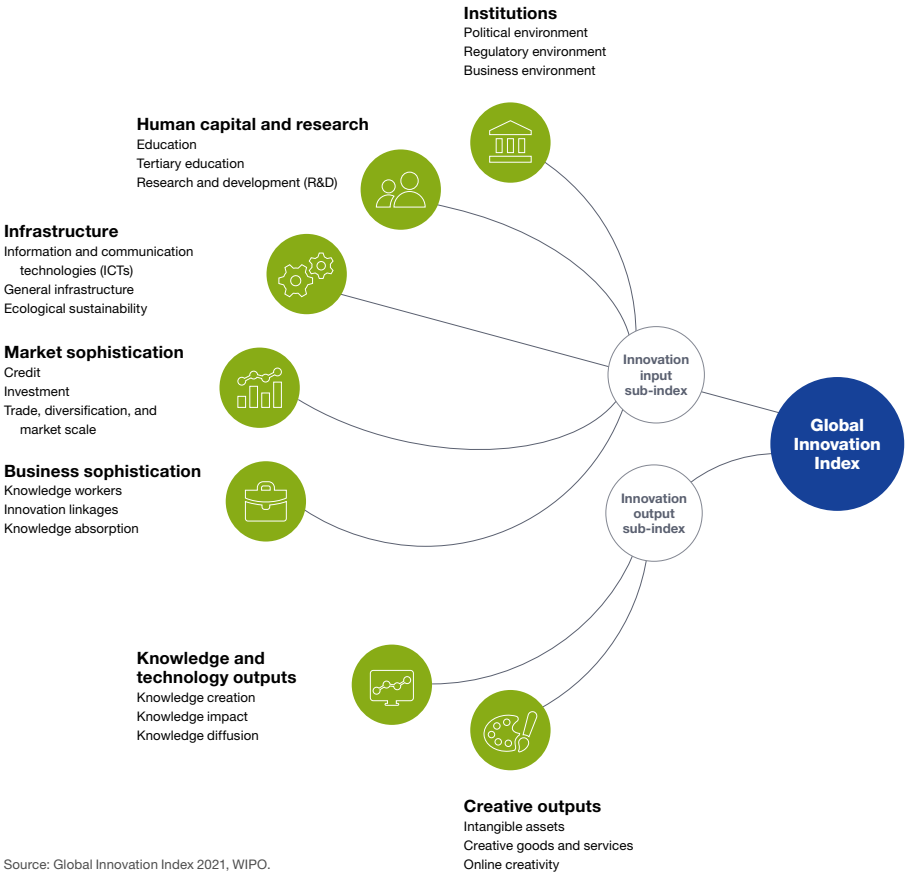
Code	Indicator name	Economy year	Model year	Source
2.1.5	Pupil-teacher ratio, secondary	2017	2019	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2016	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators

Code	Indicator name	Economy year	Model year	Source
2.3.2	Gross expenditure on R&D, % GDP	2016	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
4.1.3	Microfinance gross loans, % GDP	2017	2018	Microfinance Information Exchange
4.3.2	Domestic industry diversification	2017	2018	United Nations Industrial Development Organization
5.1.3	GERD performed by business, % GDP	2016	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.1.4	GERD financed by business, %	2016	2018	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.2.3	GERD financed by abroad, % GDP	2016	2018	UNESCO Institute for Statistics
5.3.5	Research talent, % in businesses	2016	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
6.1.1	Patents by origin/bn PPP$ GDP	2018	2019	World Intellectual Property Organization

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 2021, WIPO.

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.