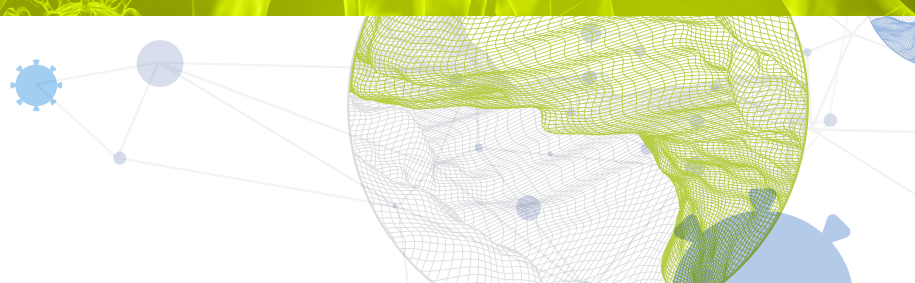




# Global Innovation Index 2021



## MADAGASCAR

**110th** Madagascar ranks 110th 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 Madagascar 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 Madagascar in the GII 2021 is between ranks 101 and 118.

### Rankings for Madagascar (2019–2021)

	GII	Innovation inputs	Innovation outputs
2021	110	127	78
2020	115	125	100
2019	121	122	109

- Madagascar performs better in innovation outputs than innovation inputs in 2021.
- This year Madagascar ranks 127th in innovation inputs, lower than both 2020 and 2019.
- As for innovation outputs, Madagascar ranks 78th. This position is higher than both 2020 and 2019.

**4th** Madagascar ranks 4th among the 13 low-income group economies.

**11th** Madagascar ranks 11th among the 27 economies in Sub-Saharan Africa.

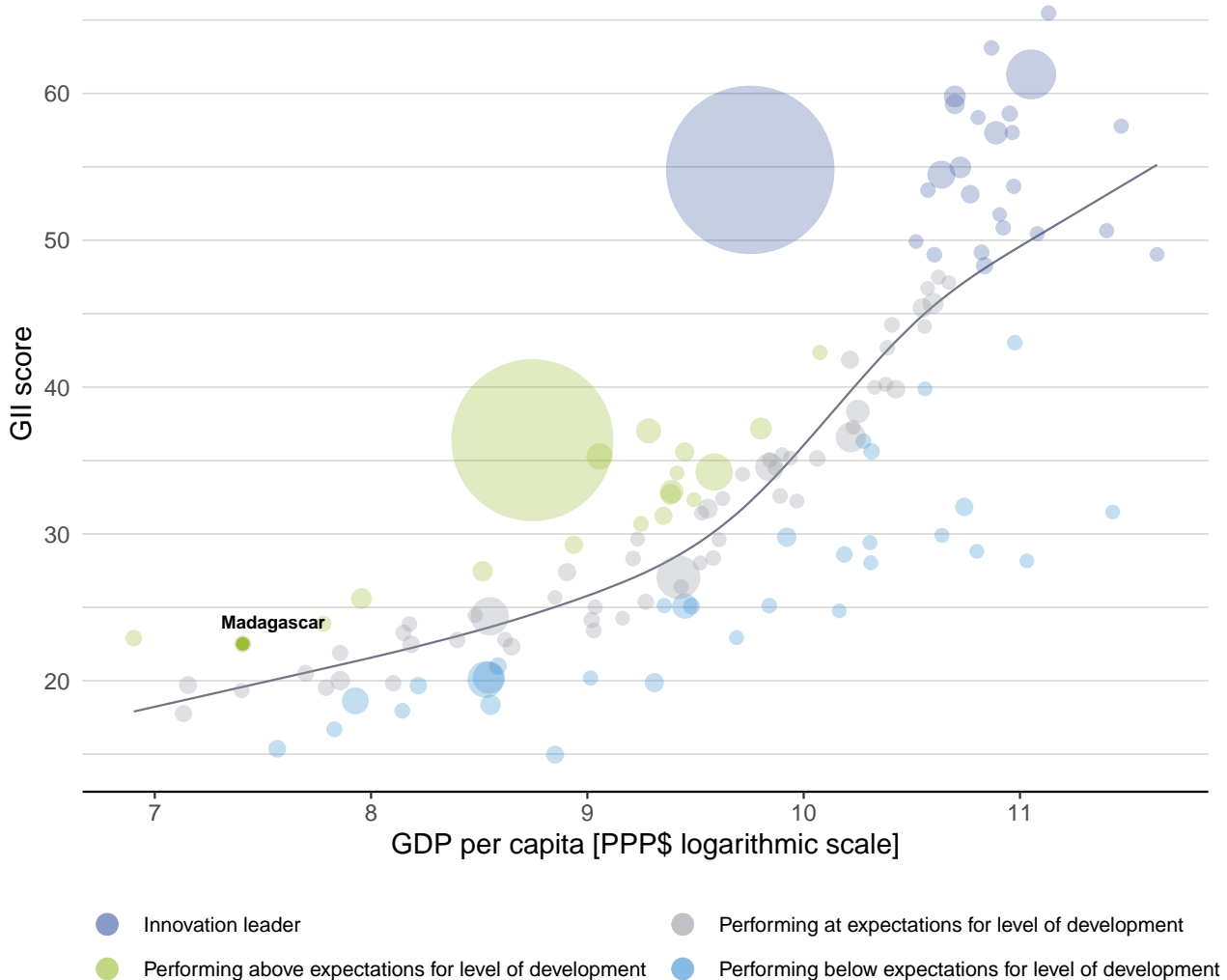


## EXPECTED VS. OBSERVED INNOVATION PERFORMANCE

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

### The positive relationship between innovation and development



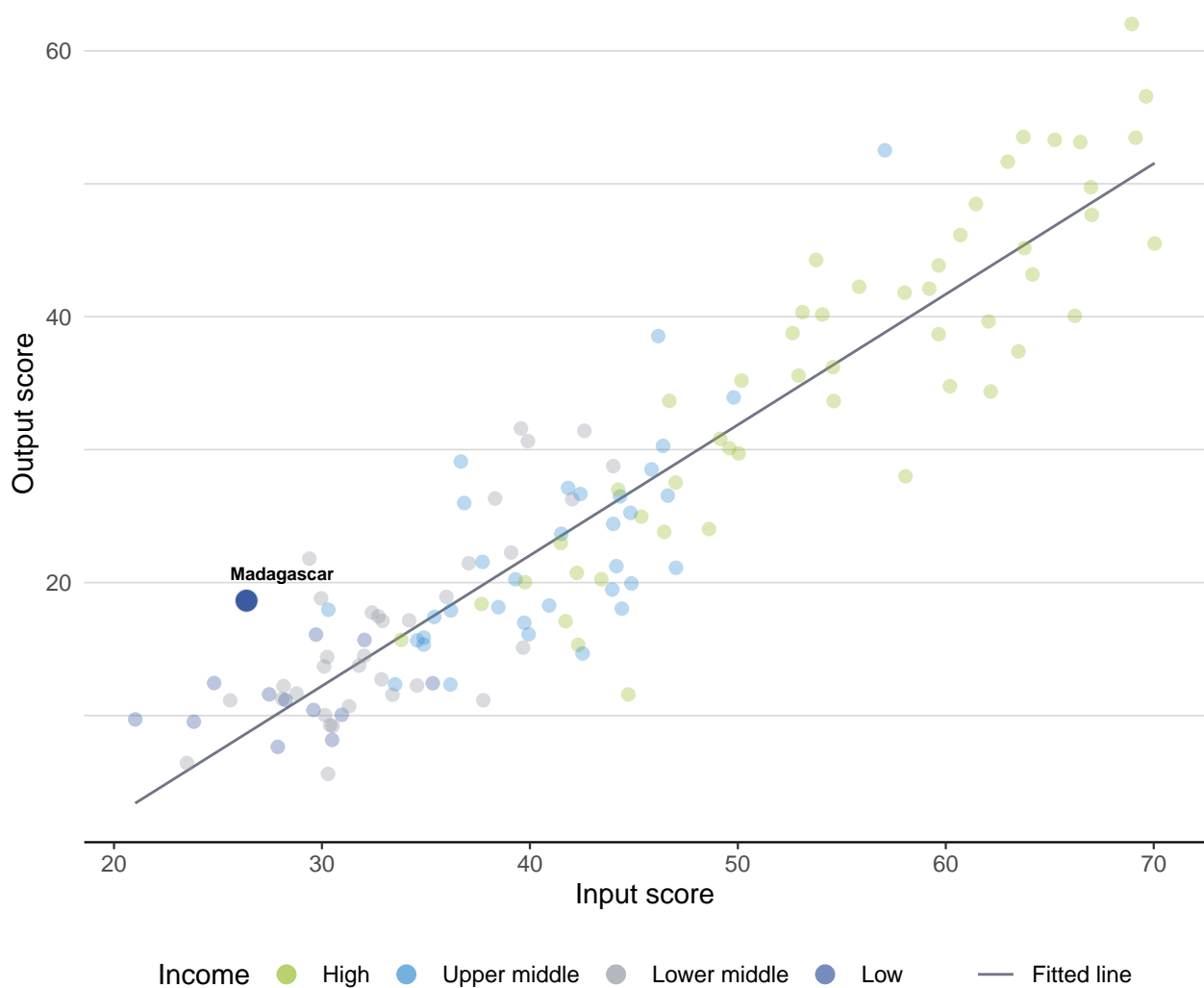


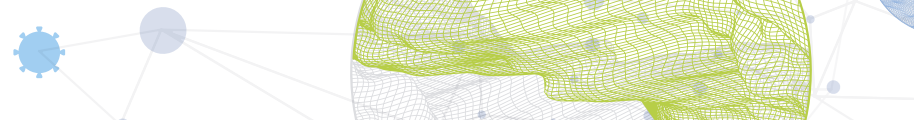
## EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

Madagascar produces more 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 Madagascar



#### Low-income group economies

Madagascar performs above the low-income group average in three pillars, namely: Human capital and research; Knowledge and technology outputs; and, Creative outputs.

#### Sub-Saharan Africa

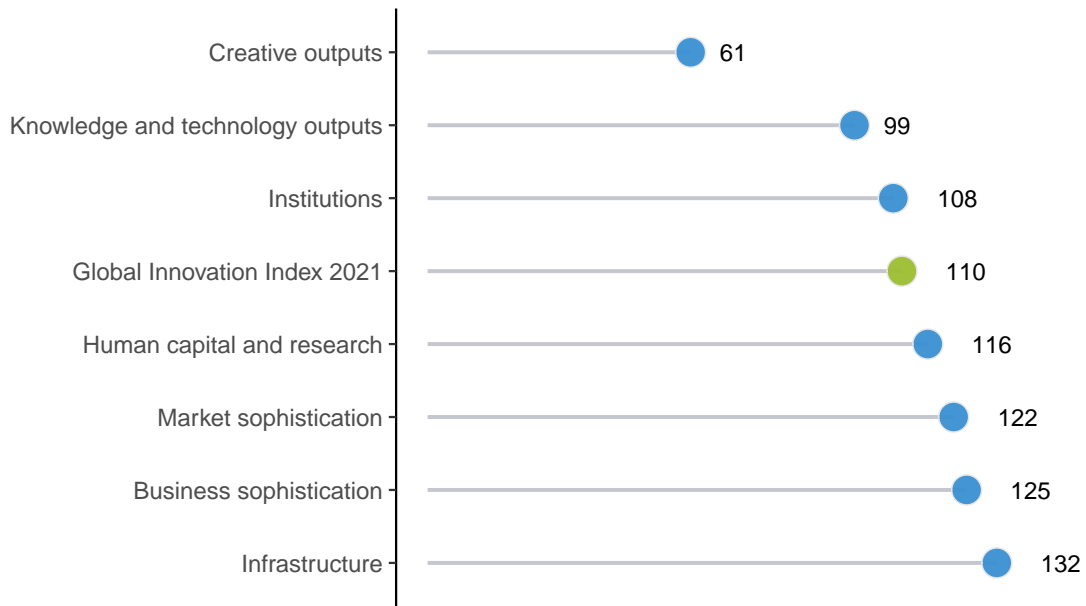
Madagascar performs above the regional average in two pillars, namely: Knowledge and technology outputs; and, Creative outputs.



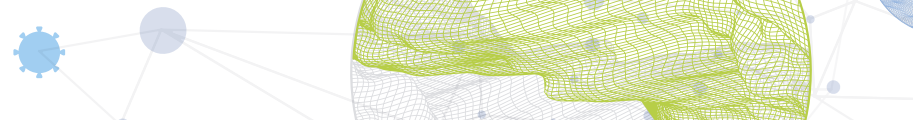
## OVERVIEW OF RANKINGS IN THE SEVEN GII 2021 AREAS

Madagascar performs best in Creative outputs and its weakest performance is in Infrastructure.

### The seven GII pillar ranks for Madagascar



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 Madagascar in the GII 2021.

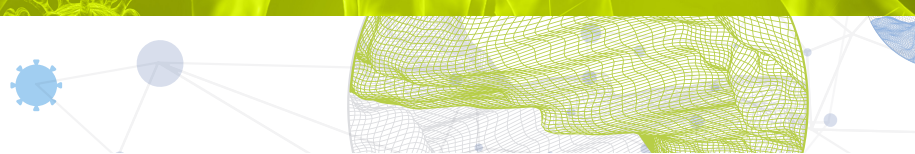
### Strengths and weaknesses for Madagascar

Strengths			Weaknesses		
Code	Indicator name	Rank	Code	Indicator name	Rank
1.2.3	Cost of redundancy dismissal	57	1.1.2	Government effectiveness	129
1.3.1	Ease of starting a business	65	2.3.2	Gross expenditure on R&D, % GDP	116
2.2.2	Graduates in science and engineering, %	47	2.3.3	Global corporate R&D investors, top 3, mn US\$	41
4.1.3	Microfinance gross loans, % GDP	20	2.3.4	QS university ranking, top 3	74
5.3.3	ICT services imports, % total trade	29	3.1	Information and communication technologies (ICTs)	131
5.3.4	FDI net inflows, % GDP	32	3.1.1	ICT access	129
6.2.1	Labor productivity growth, %	43	3.1.2	ICT use	131
6.3.4	ICT services exports, % total trade	32	3.1.4	E-participation	127
7.1.1	Trademarks by origin/bn PPP\$ GDP	31	3.3	Ecological sustainability	129
7.1.3	Industrial designs by origin/bn PPP\$ GDP	22	3.3.2	Environmental performance	127
			5.1.1	Knowledge-intensive employment, %	123
			6.1.1	Patents by origin/bn PPP\$ GDP	128
			6.1.2	PCT patents by origin/bn PPP\$ GDP	98

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$	GII 2020 rank
78	127	Low	SSF	27.7	45.4	1,647	115

	Score/ Value	Rank		Score/ Value	Rank
 <b>Institutions</b>	51.1	108	 <b>Business sophistication</b>	14.6	125
<b>1.1 Political environment</b>	37.1	125	<b>5.1 Knowledge workers</b>	5.0	[131]
1.1.1 Political and operational stability*	60.7	97	5.1.1 Knowledge-intensive employment, %	3.7	123 ○ ◇
1.1.2 Government effectiveness*	25.3	129 ○	5.1.2 Firms offering formal training, %	12.7	92 ◇
<b>1.2 Regulatory environment</b>	54.5	96	5.1.3 GERD performed by business, % GDP	n/a	n/a
1.2.1 Regulatory quality*	24.4	116	5.1.4 GERD financed by business, %	n/a	n/a
1.2.2 Rule of law*	20.1	120	5.1.5 Females employed w/advanced degrees, %	1.9	107
1.2.3 Cost of redundancy dismissal	14.7	57 ●	<b>5.2 Innovation linkages</b>	16.5	100
<b>1.3 Business environment</b>	61.6	100	5.2.1 University-industry R&D collaboration†	32.3	104
1.3.1 Ease of starting a business*	88.5	65 ●	5.2.2 State of cluster development and depth†	39.1	104
1.3.2 Ease of resolving insolvency*	34.8	113	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	112
			5.2.5 Patent families/bn PPP\$ GDP	0.0	78 ◆
 <b>Human capital and research</b>	14.4	116	<b>5.3 Knowledge absorption</b>	22.2	79
<b>2.1 Education</b>	24.5	125	5.3.1 Intellectual property payments, % total trade	0.4	75
2.1.1 Expenditure on education, % GDP	2.8	103	5.3.2 High-tech imports, % total trade	4.1	116
2.1.2 Government funding/pupil, secondary, % GDP/cap	7.2	98 ◇	5.3.3 ICT services imports, % total trade	2.2	29 ● ◆
2.1.3 School life expectancy, years	10.2	107	5.3.4 FDI net inflows, % GDP	3.8	32 ●
2.1.4 PISA scales in reading, maths and science	n/a	n/a	5.3.5 Research talent, % in businesses	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	18.1	88 ◆	 <b>Knowledge and technology outputs</b>	12.4	99
<b>2.2 Tertiary education</b>	18.5	99 ◆	<b>6.1 Knowledge creation</b>	4.3	115
2.2.1 Tertiary enrolment, % gross	5.4	123	6.1.1 Patents by origin/bn PPP\$ GDP	0.0	128 ○ ◇
2.2.2 Graduates in science and engineering, %	23.8	47 ● ◆	6.1.2 PCT patents by origin/bn PPP\$ GDP	0.0	98 ○ ◇
2.2.3 Tertiary inbound mobility, %	1.4	83	6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
<b>2.3 Research and development (R&amp;D)</b>	0.1	121	6.1.4 Scientific and technical articles/bn PPP\$ GDP	7.1	101
2.3.1 Researchers, FTE/mn pop.	34.0	99 ○	6.1.5 Citable documents H-index	4.7	109
2.3.2 Gross expenditure on R&D, % GDP	0.0	116 ○ ◇	<b>6.2 Knowledge impact</b>	19.8	105
2.3.3 Global corporate R&D investors, top 3, mn US\$	0.0	41 ○ ◇	6.2.1 Labor productivity growth, %	1.1	43 ●
2.3.4 QS university ranking, top 3*	0.0	74 ○ ◇	6.2.2 New businesses/th pop. 15–64	0.1	116
			6.2.3 Software spending, % GDP	0.0	112
			6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.6	96 ◆
			6.2.5 High-tech manufacturing, %	n/a	n/a
 <b>Infrastructure</b>	17.6	132 ○ ◇	<b>6.3 Knowledge diffusion</b>	13.1	77 ◆
<b>3.1 Information and communication technologies (ICTs)</b>	22.4	131 ○ ◇	6.3.1 Intellectual property receipts, % total trade	0.1	58 ◆
3.1.1 ICT access*	24.4	129 ○	6.3.2 Production and export complexity	20.6	110
3.1.2 ICT use*	6.8	131 ○ ◇	6.3.3 High-tech exports, % total trade	0.2	110
3.1.3 Government's online service*	28.8	126	6.3.4 ICT services exports, % total trade	3.2	32 ● ◆
3.1.4 E-participation*	29.8	127 ○	 <b>Creative outputs</b>	24.9	[61]
<b>3.2 General infrastructure</b>	16.5	116	<b>7.1 Intangible assets</b>	45.9	[25]
3.2.1 Electricity output, GWh/mn pop.	n/a	n/a	7.1.1 Trademarks by origin/bn PPP\$ GDP	63.6	31 ● ◆
3.2.2 Logistics performance*	15.9	115	7.1.2 Global brand value, top 5,000, % GDP	n/a	n/a
3.2.3 Gross capital formation, % GDP	16.4	106	7.1.3 Industrial designs by origin/bn PPP\$ GDP	6.8	22 ● ◆
<b>3.3 Ecological sustainability</b>	13.8	129 ○	7.1.4 ICTs and organizational model creation†	n/a	n/a
3.3.1 GDP/unit of energy use	n/a	n/a	<b>7.2 Creative goods and services</b>	2.2	[117]
3.3.2 Environmental performance*	26.5	127 ○ ◇	7.2.1 Cultural and creative services exports, % total trade	0.1	83
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.2	108	7.2.2 National feature films/mn pop. 15–69	0.8	90
			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	91 ◆
 <b>Market sophistication</b>	34.2	122	<b>7.3 Online creativity</b>	5.4	120
<b>4.1 Credit</b>	22.7	120	7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.1	123
4.1.1 Ease of getting credit*	40.0	113	7.3.2 Country-code TLDs/th pop. 15–69	0.1	119
4.1.2 Domestic credit to private sector, % GDP	14.2	121	7.3.3 Wikipedia edits/mn pop. 15–69	20.3	121
4.1.3 Microfinance gross loans, % GDP	1.5	20 ●	7.3.4 Mobile app creation/bn PPP\$ GDP	n/a	n/a
<b>4.2 Investment</b>	36.0	[43]			
4.2.1 Ease of protecting minority investors*	36.0	116			
4.2.2 Market capitalization, % GDP	n/a	n/a			
4.2.3 Venture capital investors, deals/bn PPP\$ GDP	n/a	n/a			
4.2.4 Venture capital recipients, deals/bn PPP\$ GDP	n/a	n/a			
<b>4.3 Trade, diversification, and market scale</b>	44.1	121			
4.3.1 Applied tariff rate, weighted avg., %	7.5	100			
4.3.2 Domestic industry diversification	n/a	n/a			
4.3.3 Domestic market scale, bn PPP\$	45.4	106			

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.



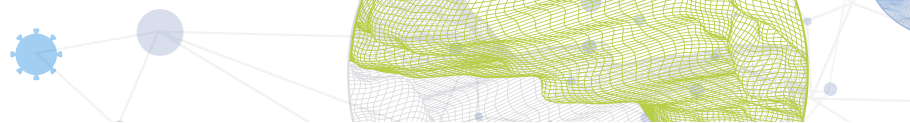
## DATA AVAILABILITY

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

### Missing data for Madagascar

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
4.2.2	Market capitalization, % GDP	n/a	2019	World Federation of Exchanges
4.2.3	Venture capital investors, deals/bn PPP\$ GDP	n/a	2020	Refinitiv Eikon
4.2.4	Venture capital recipients, deals/bn PPP\$ GDP	n/a	2020	Refinitiv Eikon
4.3.2	Domestic industry diversification	n/a	2018	United Nations Industrial Development Organization
5.1.3	GERD performed by business, % GDP	n/a	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.1.4	GERD financed by business, %	n/a	2018	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.2.3	GERD financed by abroad, % GDP	n/a	2018	UNESCO Institute for Statistics
5.3.5	Research talent, % in businesses	n/a	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
6.1.3	Utility models by origin/bn PPP\$ GDP	n/a	2019	World Intellectual Property Organization
6.2.5	High-tech manufacturing, %	n/a	2018	United Nations Industrial Development Organization
7.1.2	Global brand value, top 5,000, % GDP	n/a	2020	Brand Finance
7.1.4	ICTs and organizational model creation	n/a	2018	World Economic Forum
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

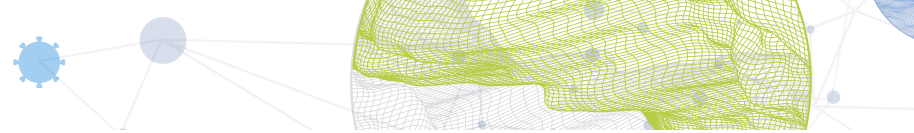




Code	Indicator name	Economy year	Model year	Source
7.3.4	Mobile app creation/bn PPP\$ GDP	n/a	2020	App Annie

### Outdated data for Madagascar

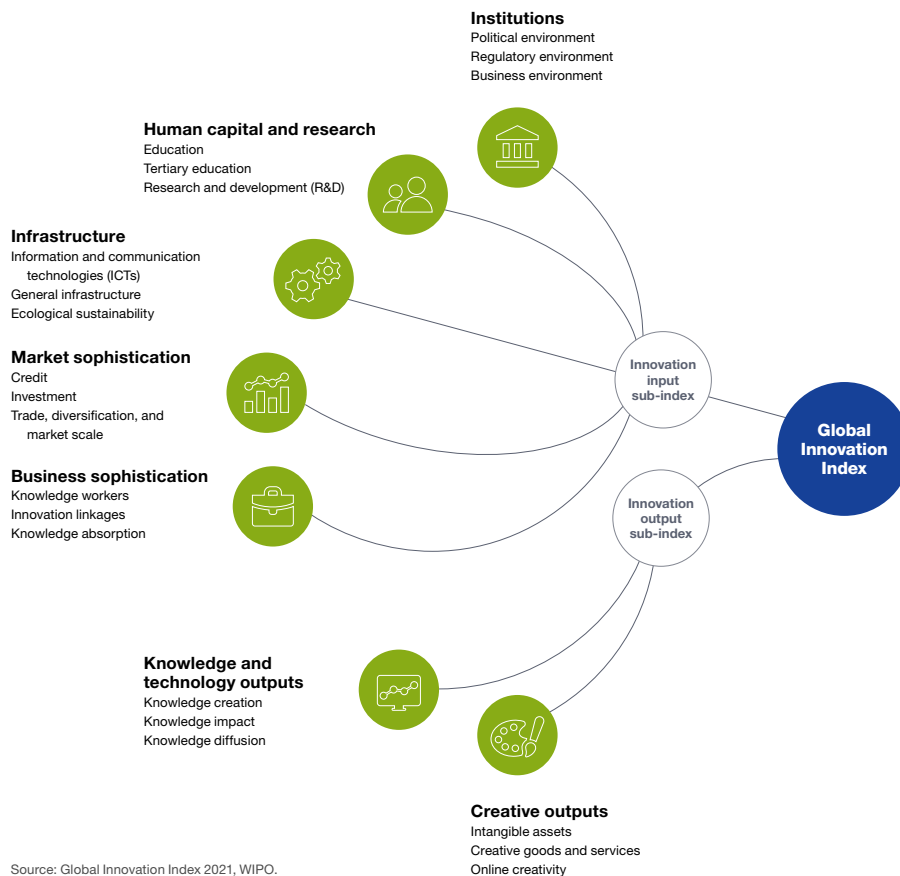
Code	Indicator name	Economy year	Model year	Source
2.1.2	Government funding/pupil, secondary, % GDP/cap	2012	2017	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2018	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
2.3.2	Gross expenditure on R&D, % GDP	2017	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.1.1	Knowledge-intensive employment, %	2015	2019	International Labour Organization
5.1.2	Firms offering formal training, %	2013	2019	World Bank
5.1.5	Females employed w/advanced degrees, %	2015	2019	International Labour Organization
5.2.1	University-industry R&D collaboration	2019	2020	World Economic Forum
5.2.2	State of cluster development and depth	2019	2020	World Economic Forum
5.2.4	Joint venture/strategic alliance deals/bn PPP\$ GDP	2019	2020	Refinitiv



## 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.



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.