MALI

126th Mali ranks 126th among the 132 economies featured in the GII 2022.

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 Mali 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 Mali in the GII 2022 is between ranks 115 and 127.

Rankings for Mali (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	123	126	116
2021	124	126	114
2022	126	128	121

- Mali performs better in innovation outputs than innovation inputs in 2022.
- This year Mali ranks 128th in innovation inputs, lower than both 2021 and 2020.
- As for innovation outputs, Mali ranks 121st. This position is lower than both 2021 and 2020.

9th Mali ranks 9th among the 12 low-income group economies.

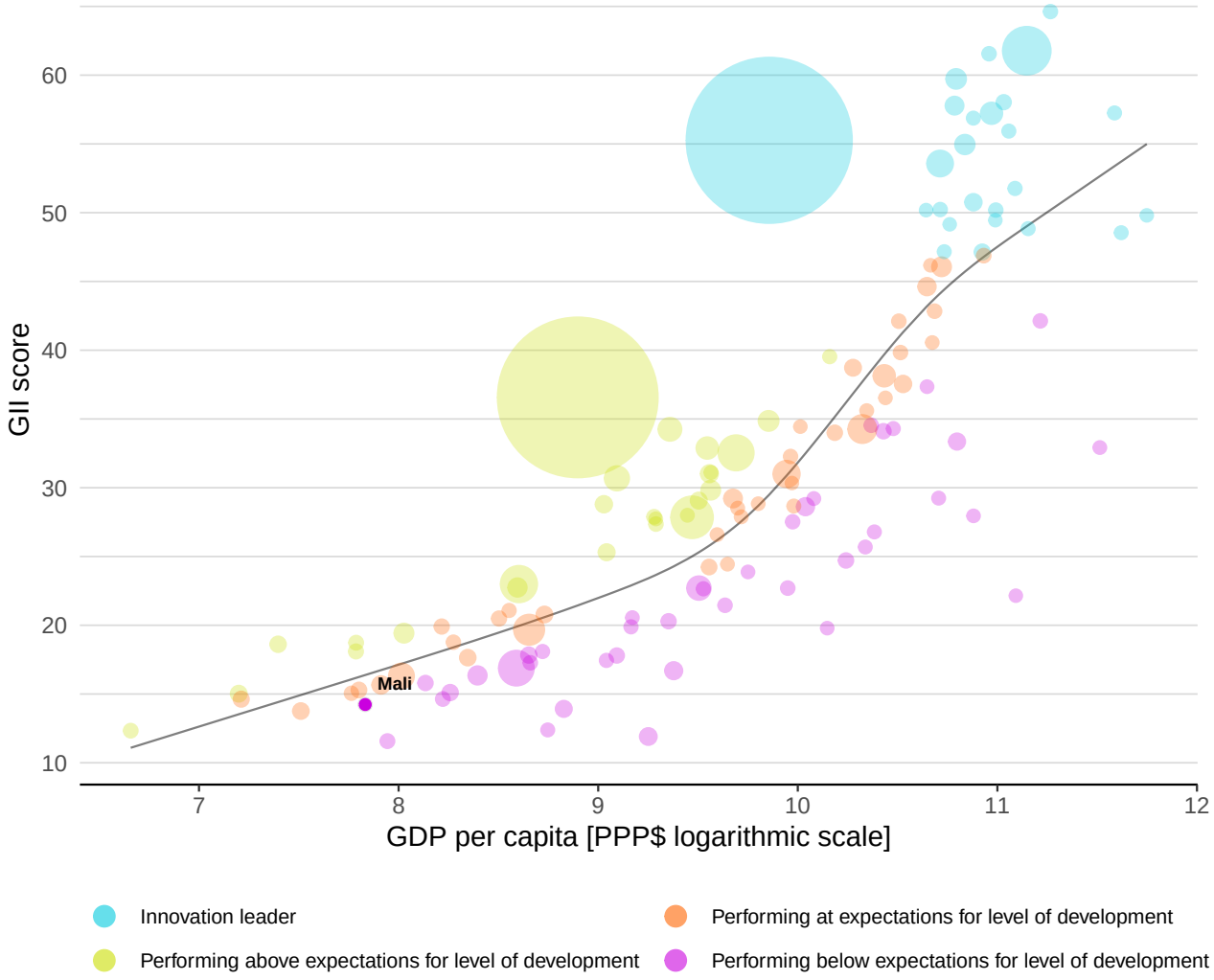
23rd Mali ranks 23rd among the 27 economies in Sub-Saharan Africa.

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, Mali's performance is below expectations for its level of development.

The positive relationship between innovation and development

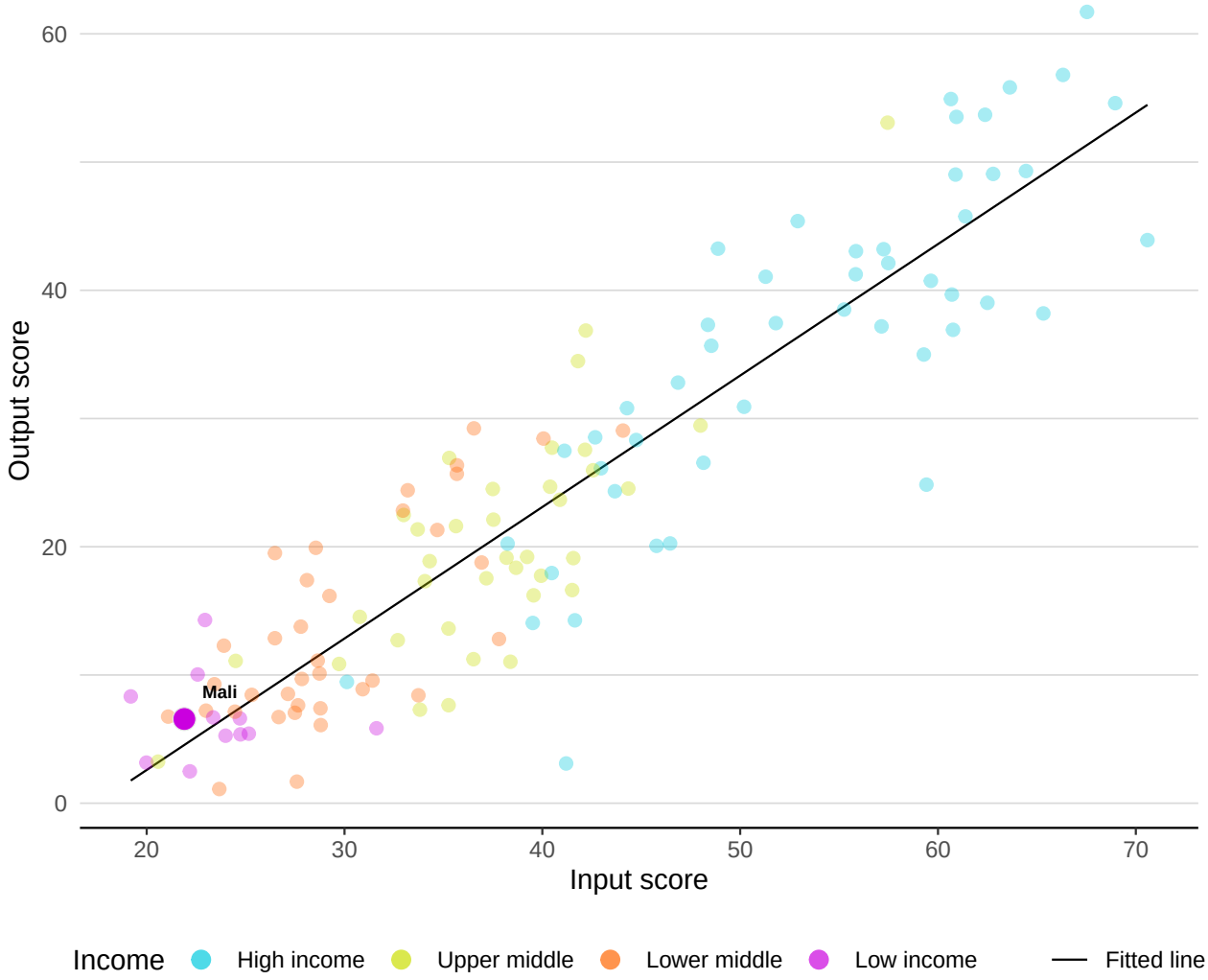


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

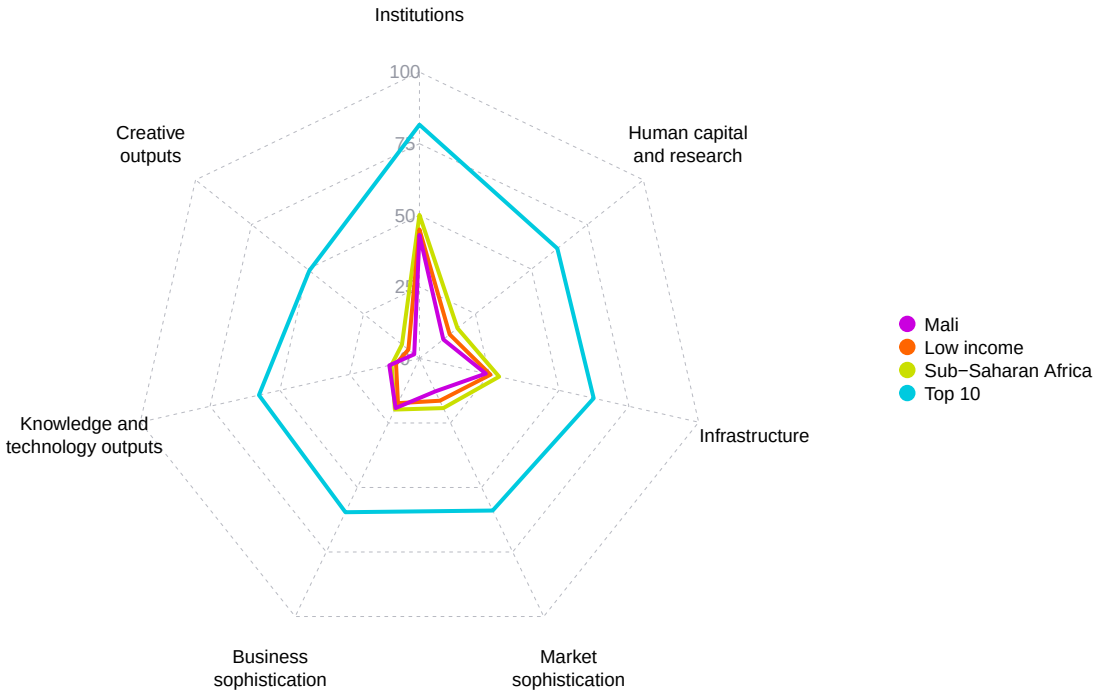
Mali produces more innovation outputs relative to its level of innovation investments.

Innovation input to output performance



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

The seven GII pillar scores for Mali



Low-income group economies

Mali performs above the low-income group average in two pillars, namely: Business sophistication; and, Knowledge and technology outputs.

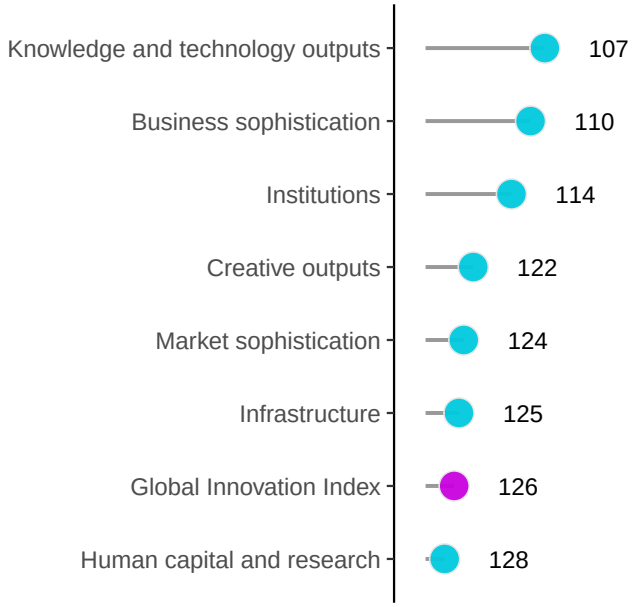
Sub-Saharan Africa

Mali performs above the regional average in Knowledge and technology outputs.

OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

Mali performs best in Knowledge and technology outputs and its weakest performance is in Human capital and research.

The seven GII pillar ranks for Mali



Note: The highest possible ranking in each pillar is 1.

The full WIPO Intellectual Property Statistics profile for Mali can be found at:

https://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=ML.

INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the indicator strengths and weaknesses of Mali in the GII 2022.

Strengths and weaknesses for Mali

Strengths			Weaknesses		
Code	**Indicator name**	**Rank**	**Code**	**Indicator name**	**Rank**
1.2.3	Cost of redundancy dismissal	50	1.1.1	Political and operational stability	130
2.1.2	Government funding/pupil, secondary, % GDP/cap	22	2.1.3	School life expectancy, years	116
4.1.3	Loans from microfinance institutions, % GDP	22	2.3.3	Global corporate R&D investors, top 3, mn USD	38
5.2.3	GERD financed by abroad, % GDP	28	2.3.4	QS university ranking, top 3	72
5.3.3	ICT services imports, % total trade	34	4.2.4	Venture capital received, value, % GDP	101
5.3.4	FDI net inflows, % GDP	47	5.1.1	Knowledge-intensive employment, %	124
5.3.5	Research talent, % in businesses	41	5.2.5	Patent families/bn PPP$ GDP	101
6.3.4	ICT services exports, % total trade	24	5.3.1	Intellectual property payments, % total trade	122
7.2.1	Cultural and creative services exports, % total trade	53	7.1.3	Global brand value, top 5,000, % GDP	77
7.3.2	Country-code TLDs/th pop. 15–69	49	7.3.3	GitHub commit pushes received/mn pop. 15–69	130

GII 2022 rank

Mali

126

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
121	128	Low	SSA	20.9	51.1	2,522

		Score/ Value	Rank	
Institutions		**43.1**	**114**	
1.1	**Political environment**	33.3	130 ○	
1.1.1	Political and operational stability*	41.8	130 ○	
1.1.2	Government effectiveness*	24.8	127	
1.2	**Regulatory environment**	57.4	88	
1.2.1	Regulatory quality*	29.8	103	
1.2.2	Rule of law*	22.1	115	
1.2.3	Cost of redundancy dismissal	13.6	50 ●	
1.3	**Business environment**	38.7	[89]	
1.3.1	Policies for doing business†	38.7	98	
1.3.2	Entrepreneurship policies and culture*	n/a	n/a	
Human capital and research		**10.7**	**128**	
2.1	**Education**	29.8	122	
2.1.1	Expenditure on education, % GDP	3.8	89	
2.1.2	Government funding/pupil, secondary, % GDP/cap	25.4	22 ●	
2.1.3	School life expectancy, years	7.5	116 ○ ◇	
2.1.4	PISA scales in reading, maths and science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary	29.7	116	
2.2	**Tertiary education**	1.6	126 ◇	
2.2.1	Tertiary enrolment, % gross	5.5	124	
2.2.2	Graduates in science and engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	0.9	90	
2.3	**Research and development (R&D)**	0.5	105	
2.3.1	Researchers, FTE/mn pop.	58.3	95	
2.3.2	Gross expenditure on R&D, % GDP	0.2	94	
2.3.3	Global corporate R&D investors, top 3, mn USD	0.0	38 ○ ◇	
2.3.4	QS university ranking, top 3*	0.0	72 ○ ◇	
Infrastructure		**23.8**	**125**	
3.1	**Information and communication technologies (ICTs)**	38.3	121	
3.1.1	ICT access*	61.8	113 ◆	
3.1.2	ICT use*	24.5	121	
3.1.3	Government's online service*	34.7	120	
3.1.4	E-participation*	32.1	121	
3.2	**General infrastructure**	16.7	115	
3.2.1	Electricity output, GWh/mn pop.	200.9	119	
3.2.2	Logistics performance*	25.1	91	
3.2.3	Gross capital formation, % GDP	19.4	98	
3.3	**Ecological sustainability**	16.3	119	
3.3.1	GDP/unit of energy use	7.9	95	
3.3.2	Environmental performance*	28.5	114 ◇	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.3	101	
Market sophistication		**12.8**	**124**	
4.1	**Credit**	14.7	100	
4.1.1	Finance for startups and scaleups*	n/a	n/a	
4.1.2	Domestic credit to private sector, % GDP	26.0	106	
4.1.3	Loans from microfinance institutions, % GDP	1.5	22 ●	
4.2	**Investment**	3.0	[95]	
4.2.1	Market capitalization, % GDP	n/a	n/a	
4.2.2	Venture capital investors, deals/bn PPP$ GDP	n/a	n/a	
4.2.3	Venture capital recipients, deals/bn PPP$ GDP	0.0	67	
4.2.4	Venture capital received, value, % GDP	0.0	101 ○ ◇	
4.3	**Trade, diversification, and market scale**	20.6	125	
4.3.1	Applied tariff rate, weighted avg., %	9.2	114	
4.3.2	Domestic industry diversification	n/a	n/a	
4.3.3	Domestic market scale, bn PPP$	51.1	104	

		Score/ Value	Rank	
Business sophistication		**19.2**	**110**	◆
5.1	**Knowledge workers**	5.1	130 ○ ◇	
5.1.1	Knowledge-intensive employment, %	3.6	124 ○	
5.1.2	Firms offering formal training, %	17.7	86	
5.1.3	GERD performed by business, % GDP	n/a	n/a	
5.1.4	GERD financed by business, %	0.8	95	
5.1.5	Females employed w/advanced degrees, %	0.5	122	
5.2	**Innovation linkages**	23.4	63 ●	
5.2.1	University-industry R&D collaboration†	39.7	79	
5.2.2	State of cluster development and depth†	44.5	80	◆
5.2.3	GERD financed by abroad, % GDP	0.1	28 ●	
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	63	
5.2.5	Patent families/bn PPP$ GDP	0.0	101 ○ ◇	
5.3	**Knowledge absorption**	29.1	67	
5.3.1	Intellectual property payments, % total trade	0.0	122 ○ ◇	
5.3.2	High-tech imports, % total trade	7.2	90	
5.3.3	ICT services imports, % total trade	2.1	34 ●	
5.3.4	FDI net inflows, % GDP	2.9	47 ●	
5.3.5	Research talent, % in businesses	31.4	41 ● ◆	
Knowledge and technology outputs		**10.8**	**107**	
6.1	**Knowledge creation**	3.2	116	
6.1.1	Patents by origin/bn PPP$ GDP	0.1	114	
6.1.2	PCT patents by origin/bn PPP$ GDP	0.0	90	
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific and technical articles/bn PPP$ GDP	5.7	109 ◇	
6.1.5	Citable documents H-index	4.5	102	
6.2	**Knowledge impact**	13.4	111	
6.2.1	Labor productivity growth, %	0.4	81	
6.2.2	New businesses/th pop. 15–64	0.3	107	
6.2.3	Software spending, % GDP	0.0	114	
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**	15.8	87	◆
6.3.1	Intellectual property receipts, % total trade	0.0	112	
6.3.2	Production and export complexity	27.5	89	◆
6.3.3	High-tech exports, % total trade	0.2	107	
6.3.4	ICT services exports, % total trade	4.3	24 ●	◆
Creative outputs		**2.3**	**122**	
7.1	**Intangible assets**	0.9	128	
7.1.1	Intangible asset intensity, top 15, %	n/a	n/a	
7.1.2	Trademarks by origin/bn PPP$ GDP	4.4	123	
7.1.3	Global brand value, top 5,000, % GDP	0.0	77 ○ ◇	
7.1.4	Industrial designs by origin/bn PPP$ GDP	0.3	100	
7.2	**Creative goods and services**	5.5	[98]	
7.2.1	Cultural and creative services exports, % total trade	0.5	53 ●	
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	Printing and other media, % manufacturing	n/a	n/a	
7.2.5	Creative goods exports, % total trade	0.0	115	
7.3	**Online creativity**	2.1	84	◆
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	6.2	49 ●	◆
7.3.3	GitHub commit pushes received/mn pop. 15–69	0.0	130 ○	
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/global_innovation_index/en/2022. 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 indicators that are either missing or outdated for Mali.

Missing data for Mali

Code	Indicator name	Economy year	Model year	Source
1.3.2	Entrepreneurship policies and culture	n/a	2021	Global Entrepreneurship Monitor
2.1.4	PISA scales in reading, maths and science	n/a	2018	OECD, PISA
2.2.2	Graduates in science and engineering, %	n/a	2020	UNESCO Institute for Statistics
4.1.1	Finance for startups and scaleups	n/a	2021	Global Entrepreneurship Monitor
4.2.1	Market capitalization, % GDP	n/a	2020	World Federation of Exchanges
4.2.2	Venture capital investors, deals/bn PPP$ GDP	n/a	2021	Refinitiv
4.3.2	Domestic industry diversification	n/a	2019	United Nations Industrial Development Organization
5.1.3	GERD performed by business, % GDP	n/a	2020	UNESCO Institute for Statistics
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	2020	World Intellectual Property Organization
6.2.5	High-tech manufacturing, %	n/a	2019	United Nations Industrial Development Organization
7.1.1	Intangible asset intensity, top 15, %	n/a	2021	Brand Finance
7.2.2	National feature films/mn pop. 15–69	n/a	2019	OMDIA
7.2.3	Entertainment and media market/th pop. 15–69	n/a	2021	PwC, GEMO
7.2.4	Printing and other media, % manufacturing	n/a	2019	United Nations Industrial Development Organization
7.3.4	Mobile app creation/bn PPP$ GDP	n/a	2021	data.ia

Outdated data for Mali

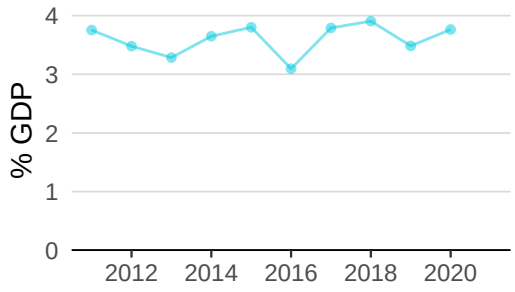
Code	Indicator name	Economy year	Model year	Source
2.1.2	Government funding/pupil, secondary, % GDP/cap	2017	2018	UNESCO Institute for Statistics
2.1.3	School life expectancy, years	2017	2019	UNESCO Institute for Statistics
2.1.5	Pupil-teacher ratio, secondary	2018	2019	UNESCO Institute for Statistics
2.2.1	Tertiary enrolment, % gross	2015	2019	UNESCO Institute for Statistics
2.2.3	Tertiary inbound mobility, %	2015	2019	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2019	2020	UNESCO Institute for Statistics
2.3.2	Gross expenditure on R&D, % GDP	2019	2020	UNESCO Institute for Statistics

Code	Indicator name	Economy year	Model year	Source
3.2.1	Electricity output, GWh/mn pop.	2019	2020	International Energy Agency
5.1.1	Knowledge-intensive employment, %	2020	2021	International Labour Organization
5.1.2	Firms offering formal training, %	2016	2019	World Bank Enterprise Surveys
5.1.4	GERD financed by business, %	2017	2019	UNESCO Institute for Statistics
5.1.5	Females employed w/advanced degrees, %	2020	2021	International Labour Organization
5.2.3	GERD financed by abroad, % GDP	2017	2019	UNESCO Institute for Statistics
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	2020	2021	Refinitiv
5.3.1	Intellectual property payments, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development
5.3.2	High-tech imports, % total trade	2019	2020	United Nations Comtrade Database
5.3.3	ICT services imports, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development
5.3.5	Research talent, % in businesses	2017	2020	UNESCO Institute for Statistics
6.3.1	Intellectual property receipts, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development
6.3.3	High-tech exports, % total trade	2019	2020	United Nations Comtrade Database
6.3.4	ICT services exports, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development
7.2.5	Creative goods exports, % total trade	2019	2020	United Nations Comtrade Database

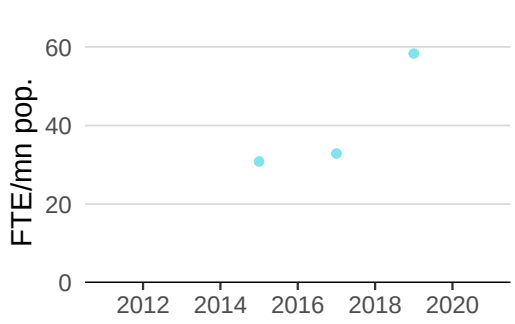
MALI'S INNOVATION SYSTEM

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

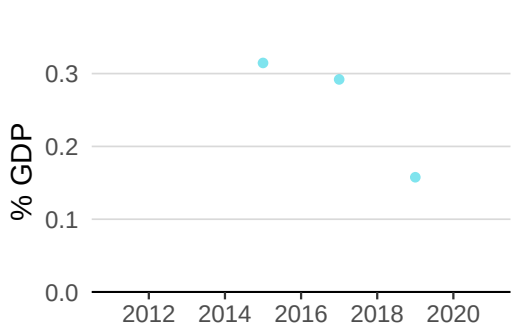
Innovation inputs



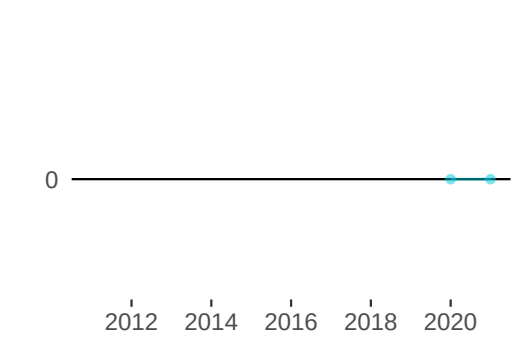
2.1.1 Expenditure on education was equal to 3.8% GDP in 2020–up by 8 percentage points from the year prior–and equivalent to an indicator rank of 89.



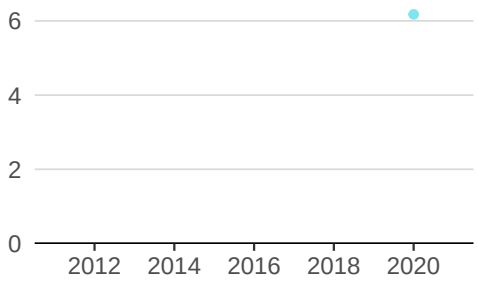
2.3.1 Researchers was equal to 58.3 FTE/mn pop. in 2019 and equivalent to an indicator rank of 95.



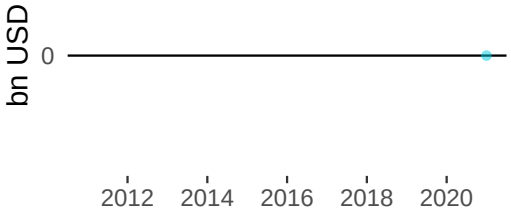
2.3.2 Gross expenditure on R&D was equal to 0.2% GDP in 2019 and equivalent to an indicator rank of 94.



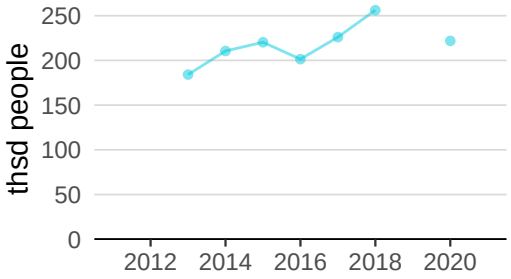
2.3.4 QS university ranking was equal to 0.0 in 2021–effectively unchanged from the year prior–and equivalent to an indicator rank of 72.



3.1.1 ICT access was equal to 6.2 in 2020 and equivalent to an indicator rank of 113.

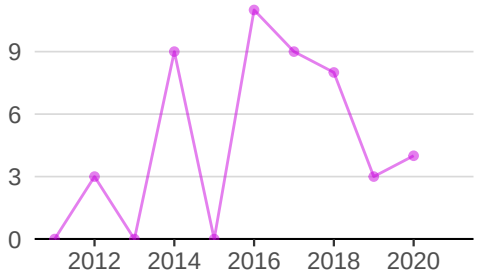


4.2.4 Venture capital received was equal to 0.0 bn USD in 2021 and equivalent to an indicator rank of 101.

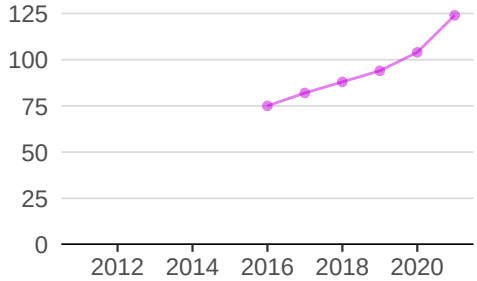


5.1.1 Knowledge-intensive employment was equal to 221.8 thsd people in 2020 and equivalent to an indicator rank of 124.

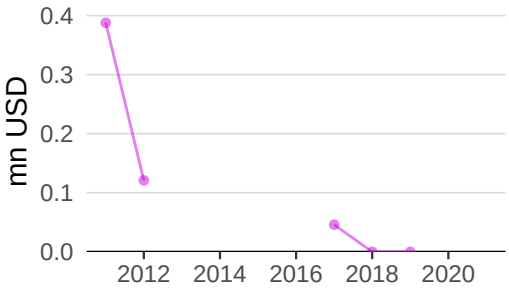
Innovation outputs



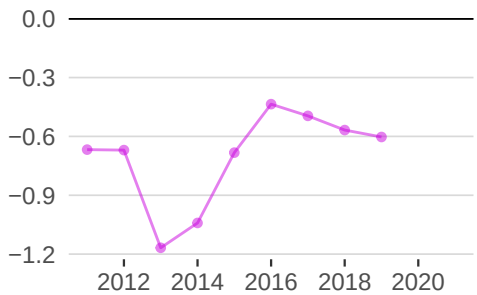
6.1.1 Patents by origin was equal to 4.0 in 2020–up by 33 percentage points from the year prior–and equivalent to an indicator rank of 114.



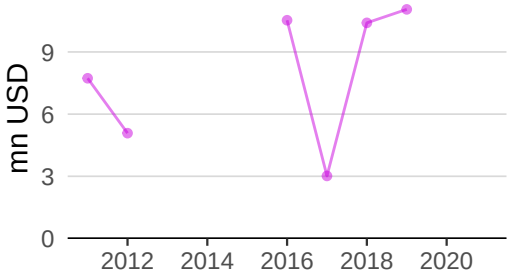
6.1.5 Citable documents H-index was equal to 124.0 in 2021–up by 19 percentage points from the year prior–and equivalent to an indicator rank of 102.



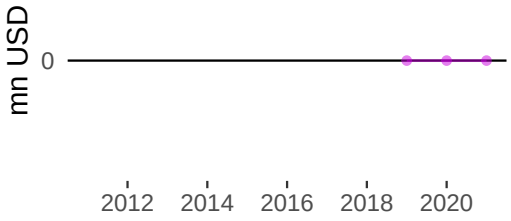
6.3.1 Intellectual property receipts was equal to 0.0 mn USD in 2019–effectively unchanged from the year prior–and equivalent to an indicator rank of 112.



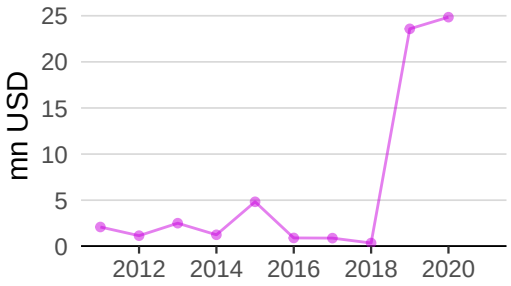
6.3.2 Production and export complexity was equal to -0.6 in 2019–down by 6 percentage points from the year prior–and equivalent to an indicator rank of 89.



6.3.3 High-tech exports was equal to 11.1 mn USD in 2019–up by 6 percentage points from the year prior–and equivalent to an indicator rank of 107.



7.1.3 Global brand value was equal to 0.0 mn USD in 2021–effectively unchanged from the year prior–and equivalent to an indicator rank of 77.



7.2.1 Cultural and creative services exports was equal to 24.8 mn USD in 2020–up by 5 percentage points from the year prior–and equivalent to an indicator rank of 53.

MALI'S INNOVATION TOP PERFORMERS

2.3.3 Global corporate R&D investors

Firm	Industry	R&D	R&D Growth	R&D Intensity	Rank

No observations

Source: European Commission's Joint Research Centre (https://iri.jrc.ec.europa.eu/scoreboard/2021-eu-industrial-rd-investment-scoreboard).

2.3.4 QS university ranking

University	Score	Rank

No observations

Source: QS Quacquarelli Symonds Ltd (https://www.topuniversities.com/university-rankings/world-university-rankings/2022).

7.1.1 Intangible asset intensity, top 15

Firm	Rank

No observations

Source: Brand Finance (https://brandirectory.com/reports/gift-2021).

7.1.3 Global brand value, top 5,000

Brand	Industry	Rank

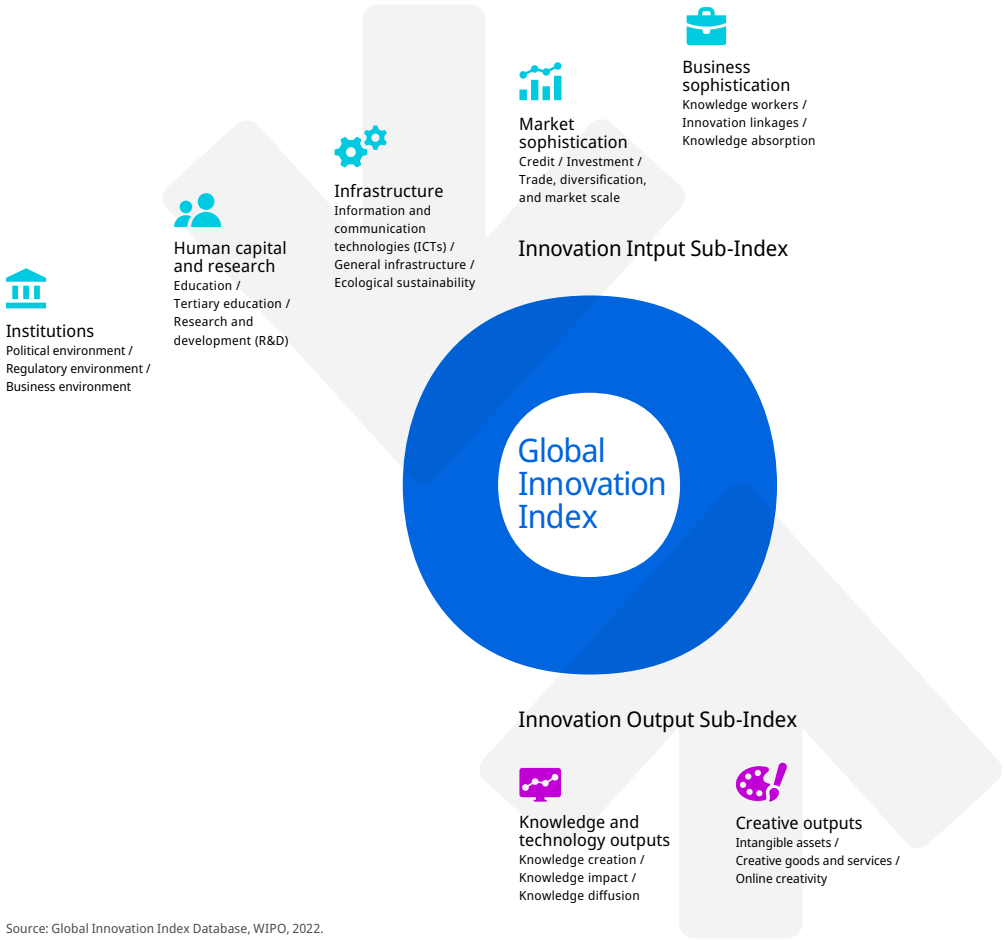
No observations

Source: Brand Finance (https://brandirectory.com).

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, 2022.

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.