Global Innovation Index 2022

SENEGAL

99th   Senegal ranks 99th 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 Senegal 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 Senegal in the GII 2022 is between ranks 98 and 103.

Rankings for Senegal (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	102	102	84
2021	105	105	102
2022	99	93	105

- Senegal performs better in innovation inputs than innovation outputs in 2022.
- This year Senegal ranks 93rd in innovation inputs, higher than both 2021 and 2020.
- As for innovation outputs, Senegal ranks 105th. This position is lower than both 2021 and 2020.

18th   Senegal ranks 18th among the 36 lower-middle-income group economies.

**7th**   Senegal 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, Senegal's performance is at expectations for its level of development.

The positive relationship between innovation and development

GII score

Senegal

GDP per capita [PPP$ logarithmic scale]

● Innovation leader
● Performing at expectations for level of development
● Performing above expectations for level of development
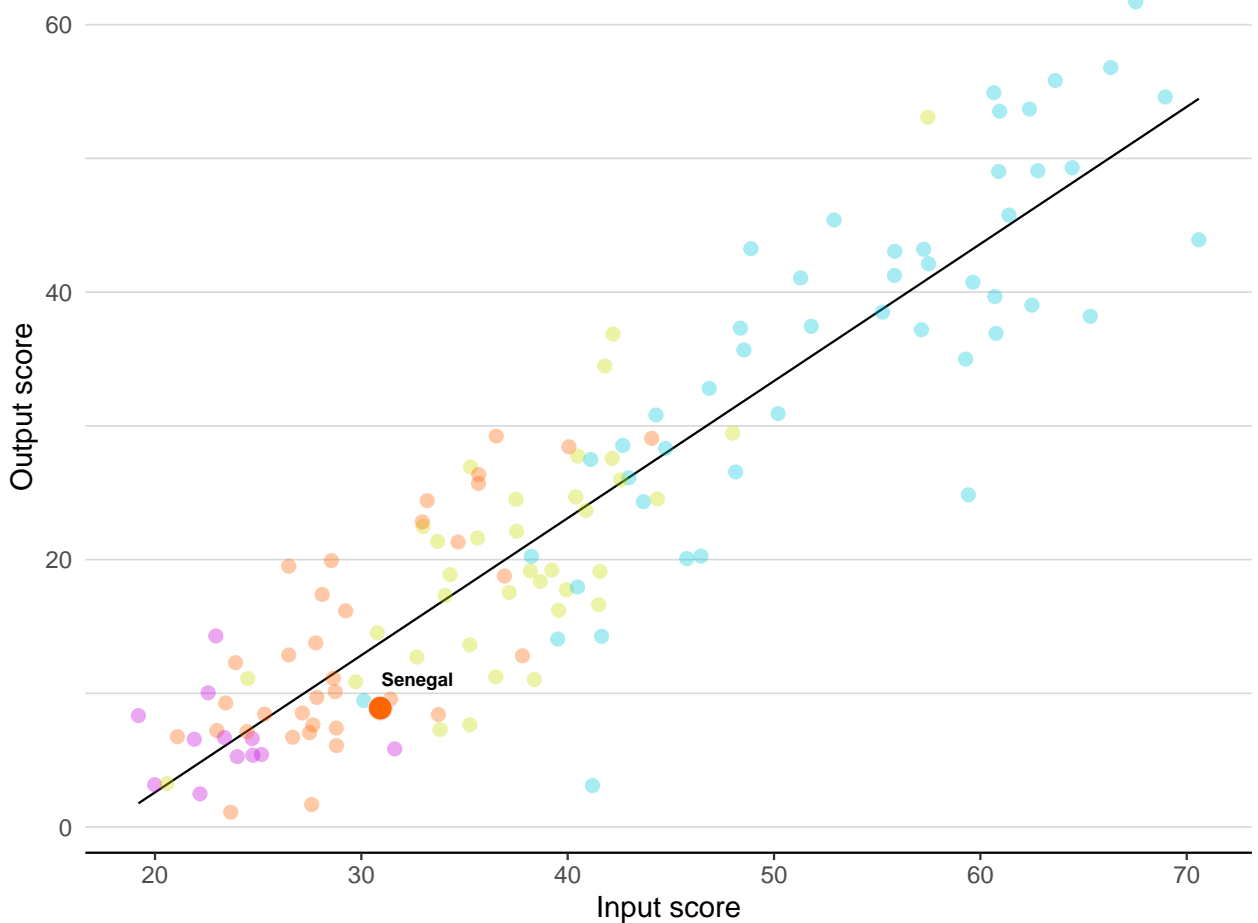● Performing below expectations for level of development
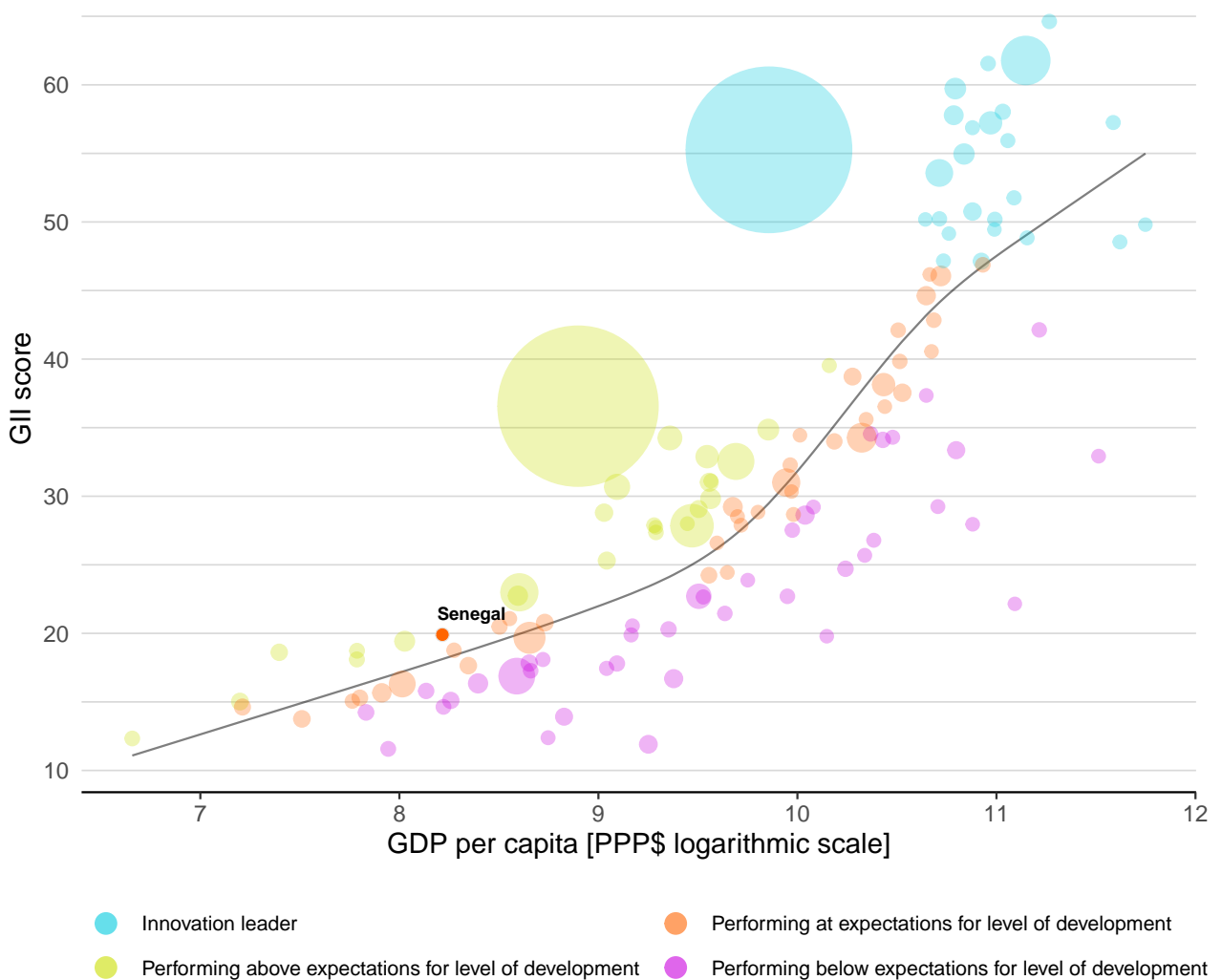
EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

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

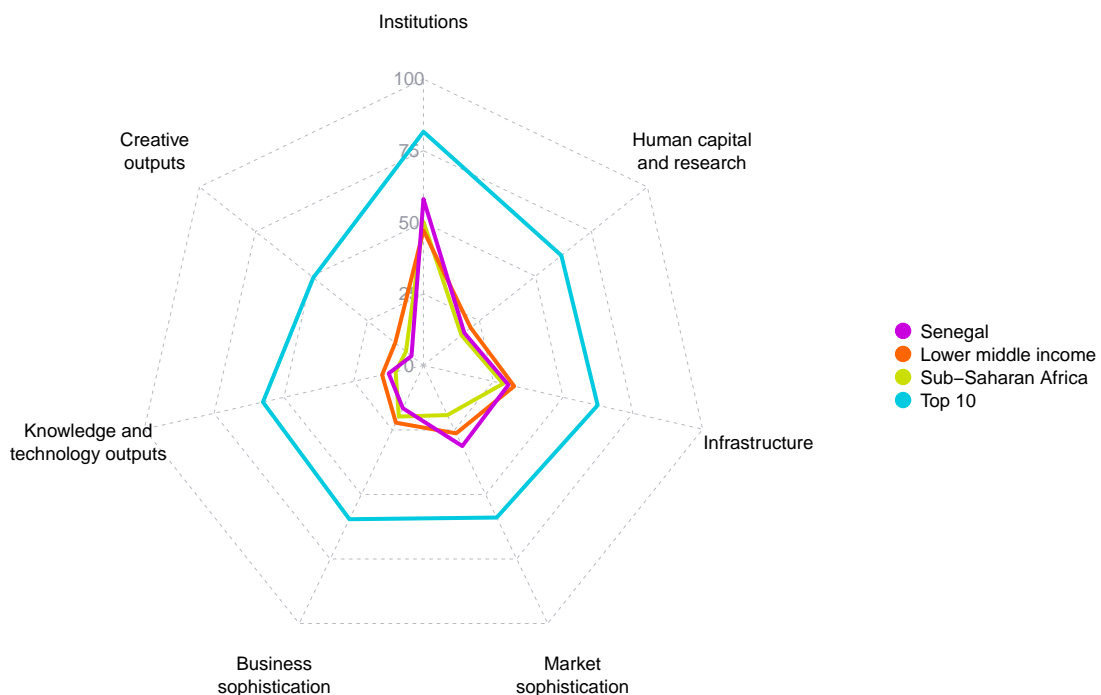## Innovation input to output performance

BENCHMARKING AGAINST OTHER LOWER MIDDLE-INCOME GROUP ECONOMIES AND SUB-SAHARAN AFRICA

The seven GII pillar scores for Senegal

Lower-middle-income group economies

Senegal performs above the lower-middle-income group average in two pillars, namely: Institutions; and, Market sophistication.
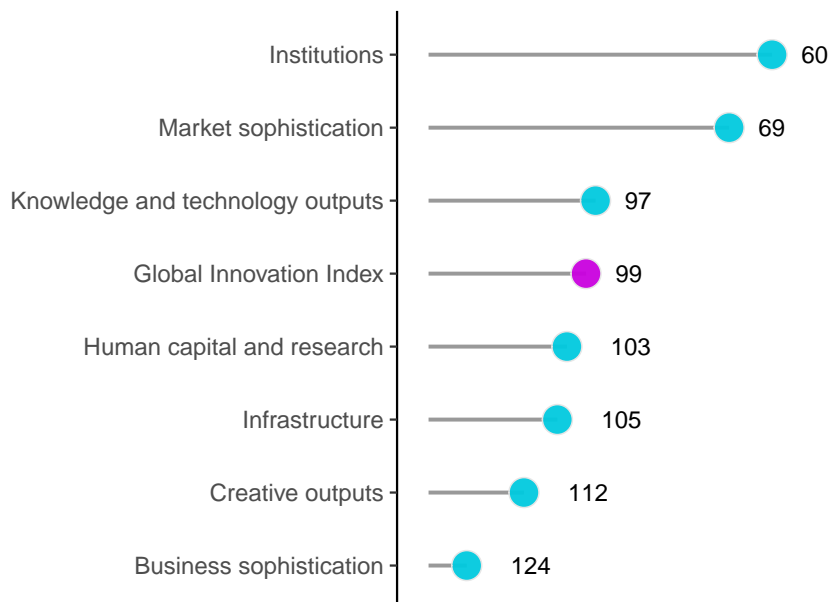
Sub-Saharan Africa

Senegal performs above the regional average in five pillars, namely: Institutions; Human capital and research; Infrastructure; Market sophistication; and, Knowledge and technology outputs.

OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

Senegal performs best in Institutions and its weakest performance is in Business sophistication.

The seven GII pillar ranks for Senegal

Pillar	Rank
Institutions	60
Market sophistication	69
Knowledge and technology outputs	97
Global Innovation Index	99
Human capital and research	103
Infrastructure	105
Creative outputs	112
Business sophistication	124

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

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

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

INNOVATION STRENGTHS AND WEAKNESSES

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

Strengths and weaknesses for Senegal

Strengths			Weaknesses		
Code	**Indicator name**	**Rank**	**Code**	**Indicator name**	**Rank**
1.1.1	Political and operational stability	46	2.1.3	School life expectancy, years	112
2.1.1	Expenditure on education, % GDP	26	2.3.3	Global corporate R&D investors, top 3, mn USD	38
2.2.3	Tertiary inbound mobility, %	36	2.3.4	QS university ranking, top 3	72
3.2.3	Gross capital formation, % GDP	10	3.2.1	Electricity output, GWh/mn pop.	116
4.1.3	Loans from microfinance institutions, % GDP	10	3.2.2	Logistics performance	119
4.2.3	Venture capital recipients, deals/bn PPP$ GDP	33	5.1.1	Knowledge-intensive employment, %	120
4.2.4	Venture capital received, value, % GDP	12	5.1.2	Firms offering formal training, %	87
5.3.4	FDI net inflows, % GDP	20	5.1.5	Females employed w/advanced degrees, %	116
6.2.1	Labor productivity growth, %	49	6.3.3	High-tech exports, % total trade	118
7.2.1	Cultural and creative services exports, % total trade	36	7.3.4	Mobile app creation/bn PPP$ GDP	110

Senegal

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
105	93	Lower middle	SSA	17.2	63.6	3,699

	Score/Value	Rank	
🏛 Institutions	**58.1**	**60**	◆
1.1 Political environment	61.3	59	◆
1.1.1 Political and operational stability*	72.7	46	● ◆
1.1.2 Government effectiveness*	49.9	70	◆
1.2 Regulatory environment	62.9	72	◆
1.2.1 Regulatory quality*	39.7	88	
1.2.2 Rule of law*	38.9	77	
1.2.3 Cost of redundancy dismissal	14.8	59	
1.3 Business environment	50.1	[58]	
1.3.1 Policies for doing business†	50.1	62	
1.3.2 Entrepreneurship policies and culture*	n/a	n/a	

	Score/Value	Rank	
👨‍🔬 Human capital and research	**18.2**	**103**	
2.1 Education	39.1	99	
2.1.1 Expenditure on education, % GDP	5.5	26	● ◆
2.1.2 Government funding/pupil, secondary, % GDP/cap ⊘	20.5	52	
2.1.3 School life expectancy, years	9.0	112	○ ◇
2.1.4 PISA scales in reading, maths and science	n/a	n/a	
2.1.5 Pupil-teacher ratio, secondary	23.3	102	
2.2 Tertiary education	12.8	104	
2.2.1 Tertiary enrolment, % gross	14.0	105	
2.2.2 Graduates in science and engineering, %	n/a	n/a	
2.2.3 Tertiary inbound mobility, %	7.0	36	● ◆
2.3 Research and development (R&D)	2.8	80	
2.3.1 Researchers, FTE/mn pop. ⊘	564.3	65	
2.3.2 Gross expenditure on R&D, % GDP ⊘	0.6	55	
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	○ ◇

	Score/Value	Rank	
⚙ Infrastructure	**30.4**	**105**	
3.1 Information and communication technologies (ICTs)	48.6	105	
3.1.1 ICT access*	63.8	109	
3.1.2 ICT use*	36.9	106	
3.1.3 Government's online service*	49.4	107	
3.1.4 E-participation*	44.0	110	
3.2 General infrastructure	20.8	104	
3.2.1 Electricity output, GWh/mn pop. ⊘	319.6	116	○
3.2.2 Logistics performance*	9.3	119	○ ◇
3.2.3 Gross capital formation, % GDP	34.1	10	●
3.3 Ecological sustainability	21.9	83	
3.3.1 GDP/unit of energy use	11.5	54	
3.3.2 Environmental performance*	33.9	96	
3.3.3 ISO 14001 environmental certificates/bn PPP$ GDP	0.2	111	

	Score/Value	Rank	
📊 Market sophistication	**31.2**	**69**	
4.1 Credit	28.8	57	
4.1.1 Finance for startups and scaleups*	n/a	n/a	
4.1.2 Domestic credit to private sector, % GDP	29.2	95	
4.1.3 Loans from microfinance institutions, % GDP	3.3	10	●
4.2 Investment	25.4	29	●
4.2.1 Market capitalization, % GDP	n/a	n/a	
4.2.2 Venture capital investors, deals/bn PPP$ GDP	0.0	78	
4.2.3 Venture capital recipients, deals/bn PPP$ GDP	0.1	33	● ◆
4.2.4 Venture capital received, value, % GDP	0.0	12	● ◆
4.3 Trade, diversification, and market scale	39.5	101	
4.3.1 Applied tariff rate, weighted avg., %	9.1	112	
4.3.2 Domestic industry diversification	76.0	76	
4.3.3 Domestic market scale, bn PPP$	63.6	95	

	Score/Value	Rank	
💼 Business sophistication	**16.6**	**124**	○ ◇
5.1 Knowledge workers	6.2	127	○ ◇
5.1.1 Knowledge-intensive employment, % ⊘	4.6	120	○ ◇
5.1.2 Firms offering formal training, % ⊘	17.4	87	○
5.1.3 GERD performed by business, % GDP	n/a	n/a	
5.1.4 GERD financed by business, % ⊘	2.1	88	
5.1.5 Females employed w/advanced degrees, % ⊘	1.0	116	○
5.2 Innovation linkages	18.8	101	
5.2.1 University-industry R&D collaboration†	43.0	70	
5.2.2 State of cluster development and depth†	39.8	106	
5.2.3 GERD financed by abroad, % GDP ⊘	0.0	51	◆
5.2.4 Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	106	
5.2.5 Patent families/bn PPP$ GDP	0.0	81	
5.3 Knowledge absorption	24.6	90	
5.3.1 Intellectual property payments, % total trade ⊘	0.1	100	
5.3.2 High-tech imports, % total trade	6.3	105	
5.3.3 ICT services imports, % total trade ⊘	1.4	67	
5.3.4 FDI net inflows, % GDP	4.7	20	●
5.3.5 Research talent, % in businesses	n/a	n/a	

	Score/Value	Rank	
📱 Knowledge and technology outputs	**12.4**	**97**	
6.1 Knowledge creation	4.5	112	
6.1.1 Patents by origin/bn PPP$ GDP	0.2	93	
6.1.2 PCT patents by origin/bn PPP$ GDP	0.0	77	
6.1.3 Utility models by origin/bn PPP$ GDP ⊘	0.0	68	
6.1.4 Scientific and technical articles/bn PPP$ GDP	9.5	92	
6.1.5 Citable documents H-index	5.8	92	
6.2 Knowledge impact	22.0	81	
6.2.1 Labor productivity growth, %	1.5	49	●
6.2.2 New businesses/th pop. 15–64	0.5	97	
6.2.3 Software spending, % GDP	0.2	68	
6.2.4 ISO 9001 quality certificates/bn PPP$ GDP	1.3	100	
6.2.5 High-tech manufacturing, %	22.1	59	
6.3 Knowledge diffusion	10.9	100	
6.3.1 Intellectual property receipts, % total trade ⊘	0.1	63	
6.3.2 Production and export complexity	22.8	97	
6.3.3 High-tech exports, % total trade	0.1	118	○
6.3.4 ICT services exports, % total trade ⊘	2.1	62	

	Score/Value	Rank	
🎨 Creative outputs	**5.3**	**112**	
7.1 Intangible assets	4.6	116	○
7.1.1 Intangible asset intensity, top 15, %	n/a	n/a	
7.1.2 Trademarks by origin/bn PPP$ GDP	9.2	111	
7.1.3 Global brand value, top 5,000, % GDP	14.5	52	
7.1.4 Industrial designs by origin/bn PPP$ GDP	0.6	83	
7.2 Creative goods and services	11.8	[78]	
7.2.1 Cultural and creative services exports, % total trade	0.8	36	●
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	0.7	67	
7.2.5 Creative goods exports, % total trade	0.0	110	
7.3 Online creativity	0.4	111	
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.0	94	
7.3.2 Country-code TLDs/th pop. 15–69	0.2	110	
7.3.3 GitHub commit pushes received/mn pop. 15–69	0.5	111	
7.3.4 Mobile app creation/bn PPP$ GDP	0.0	110	○

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 Senegal.

Missing data for Senegal

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
5.1.3	GERD performed by business, % GDP	n/a	2020	UNESCO Institute for Statistics
5.3.5	Research talent, % in businesses	n/a	2020	UNESCO Institute for Statistics
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

Outdated data for Senegal

| Code	Indicator name	Economy year	Model year	Source
2.1.2	Government funding/pupil, secondary, % GDP/cap	2015	2018	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2015	2020	UNESCO Institute for Statistics
2.3.2	Gross expenditure on R&D, % GDP	2015	2020	UNESCO Institute for Statistics
3.2.1	Electricity output, GWh/mn pop.	2019	2020	International Energy Agency
5.1.1	Knowledge-intensive employment, %	2019	2021	International Labour Organization
5.1.2	Firms offering formal training, %	2014	2019	World Bank Enterprise Surveys
5.1.4	GERD financed by business, %	2015	2019	UNESCO Institute for Statistics
5.1.5	Females employed w/advanced degrees, %	2019	2021	International Labour Organization
5.2.3	GERD financed by abroad, % GDP	2015	2019	UNESCO Institute for Statistics
5.3.1	Intellectual property payments, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development
5.3.3	ICT services imports, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development
6.1.3	Utility models by origin/bn PPP$ GDP	2019	2020	World Intellectual Property Organization

Code	Indicator name	Economy year	Model year	Source
6.3.1	Intellectual property receipts, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development
6.3.4	ICT services exports, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development

SENEGAL'S INNOVATION SYSTEM

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

Innovation inputs
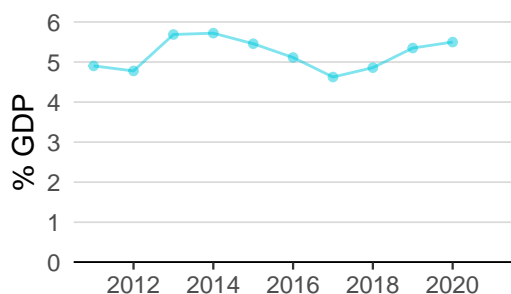
2.1.1 Expenditure on education was equal to 5.5% GDP in 2020–up by 3 percentage points from the year prior–and equivalent to an indicator rank of 26.

2.3.1 Researchers was equal to 564.3 FTE/mn pop. in 2015 and equivalent to an indicator rank of 65.

2.3.2 Gross expenditure on R&D was equal to 0.6% GDP in 2015 and equivalent to an indicator rank of 55.
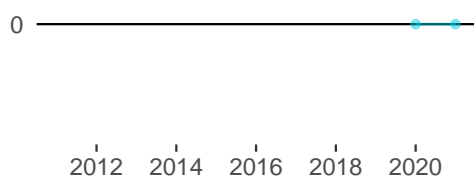
2.3.4 QS university ranking was equal to 0.0 in 2021–effectively unchanged from the year prior–and equivalent to an indicator rank of 72.
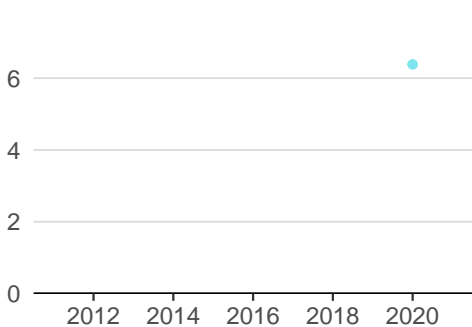
3.1.1 ICT access was equal to 6.4 in 2020 and equivalent to an indicator rank of 109.
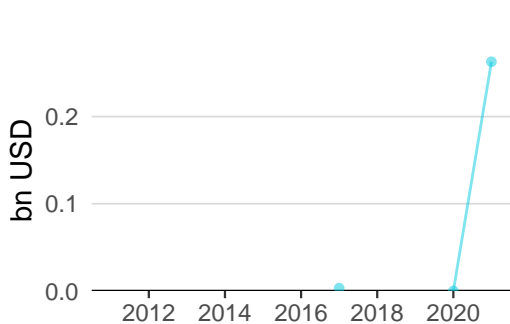
4.2.4 Venture capital received was equal to 0.3 bn USD in 2021–up by Inf percentage points from the year prior–and equivalent to an indicator rank of 12.
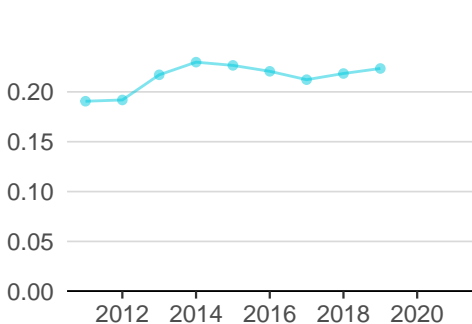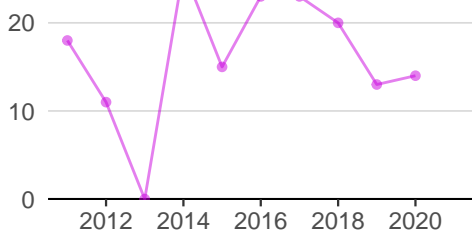
4.3.2 Domestic industry diversification was equal to 0.2 in 2019–up by 2 percentage points from the year prior–and equivalent to an indicator rank of 76.
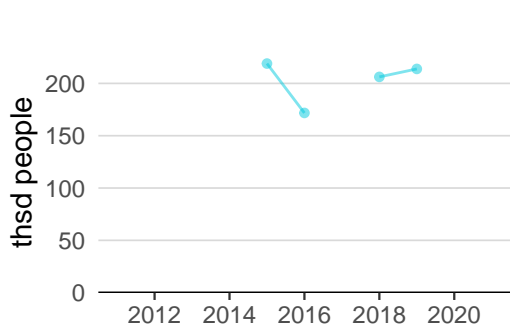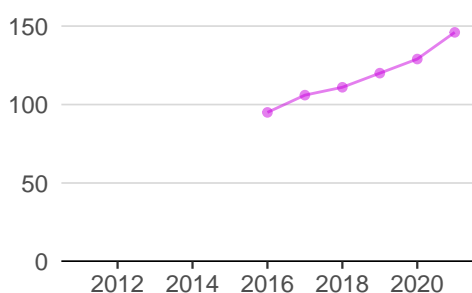
5.1.1 Knowledge-intensive employment was equal to 213.8 thsd people in 2019–up by 4 percentage points from the year prior–and equivalent to an indicator rank of 120.
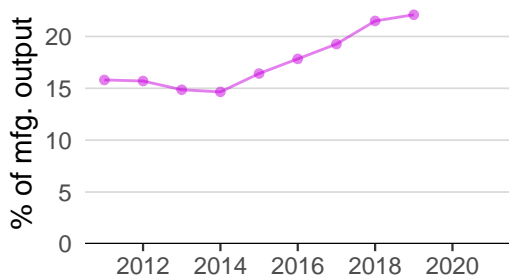
Innovation outputs

6.1.1 Patents by origin was equal to 14.0 in 2020–up by 8 percentage points from the year prior–and equivalent to an indicator rank of 93.


6.1.5 Citable documents H-index was equal to 146.0 in 2021–up by 13 percentage points from the year prior–and equivalent to an indicator rank of 92.


6.2.5 High-tech manufacturing was equal to 22.1% of mfg. output in 2019–up by 3 percentage points from the year prior–and equivalent to an indicator rank of 59.
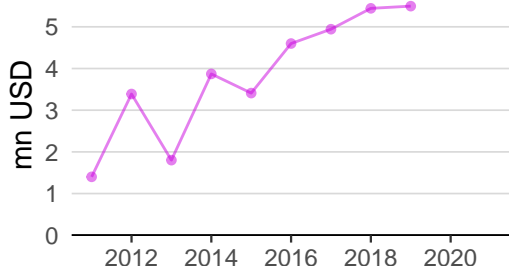
6.3.1 Intellectual property receipts was equal to 5.5 mn USD in 2019–up by 1 percentage point from the year prior–and equivalent to an indicator rank of 63.
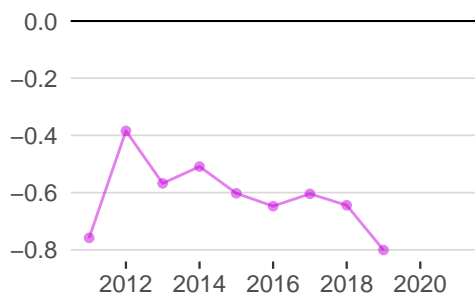
6.3.2 Production and export complexity was equal to -0.8 in 2019–down by 24 percentage points from the year prior–and equivalent to an indicator rank of 97.
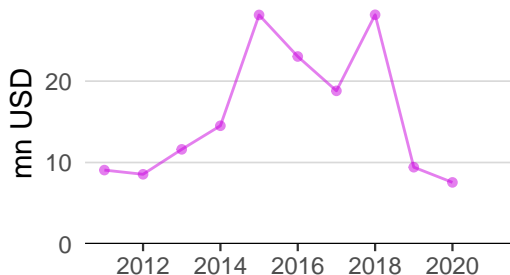
6.3.3 High-tech exports was equal to 7.6 mn USD in 2020–down by 20 percentage points from the year prior–and equivalent to an indicator rank of 118.

7.1.3 Global brand value was equal to 400.8 mn USD in 2021–effectively unchanged from the year prior–and equivalent to an indicator rank of 52.
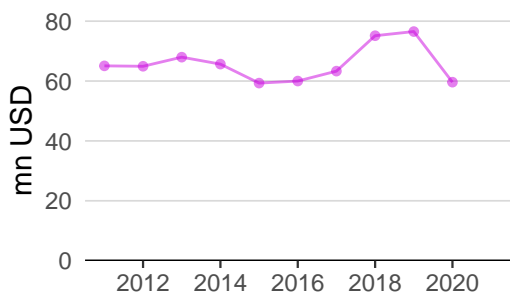
7.2.1 Cultural and creative services exports was equal to 59.6 mn USD in 2020–down by 22 percentage points from the year prior–and equivalent to an indicator rank of 36.

SENEGAL'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

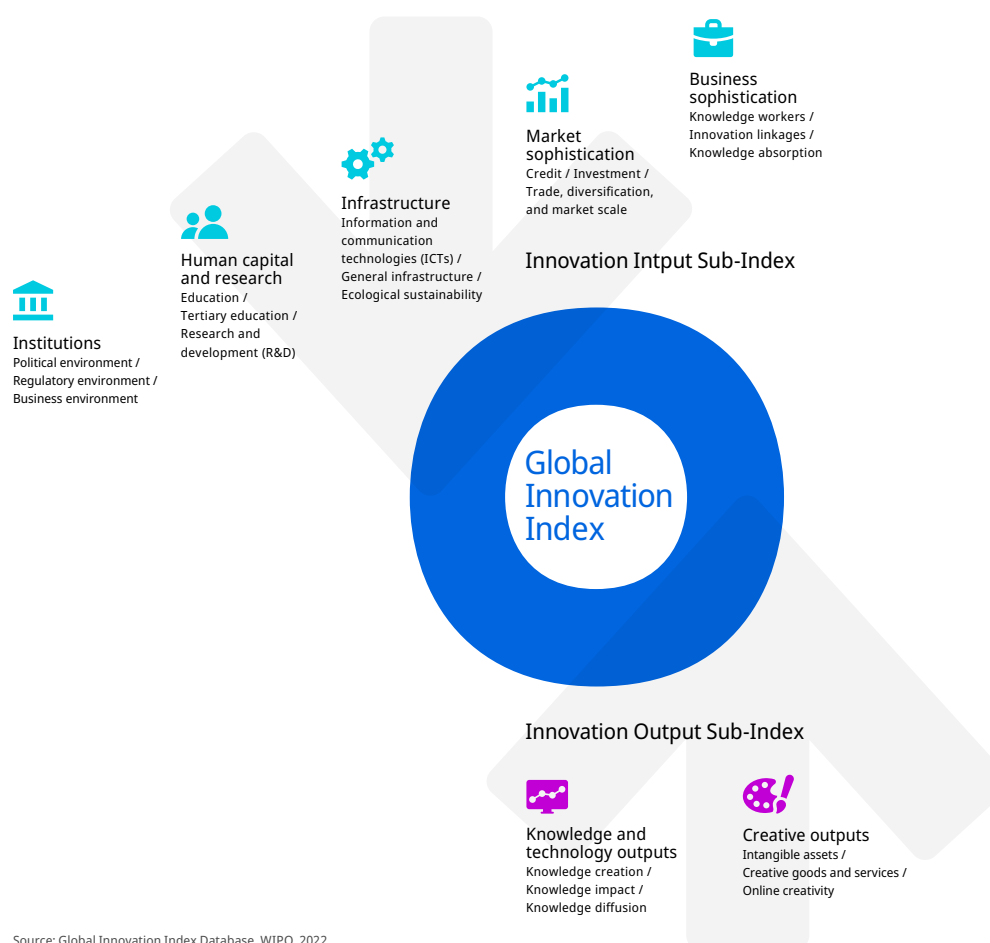| Brand	Industry	Rank
SONATEL	Telecoms	1

Source: Brand Finance (https://brandirectory.com).
Note: Rank corresponds to within economy ranks.

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.

Business sophistication
Knowledge workers /
Innovation linkages /
Knowledge absorption

Market sophistication
Credit / Investment /
Trade, diversification,
and market scale

Infrastructure
Information and
communication
technologies (ICTs) /
General infrastructure /
Ecological sustainability

Innovation Intput Sub-Index

Human capital and research
Education /
Tertiary education /
Research and
development (R&D)

Institutions
Political environment /
Regulatory environment /
Business environment

Global Innovation Index

Innovation Output Sub-Index

Knowledge and technology outputs
Knowledge creation /
Knowledge impact /
Knowledge diffusion

Creative outputs
Intangible assets /
Creative goods and services /
Online creativity

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.