

Global Innovation Index 2023

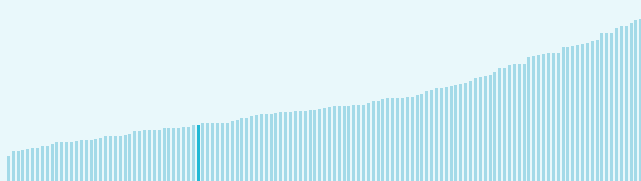


The Global Innovation Index (GII) **ranks world economies according to their innovation capabilities.**

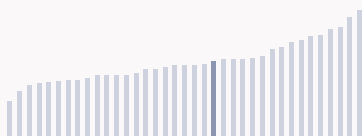
Consisting of **roughly 80 indicators**, grouped into innovation inputs and outputs, the GII **aims to capture the multi-dimensional facets of innovation.**

Senegal ranking in the Global Innovation Index 2023

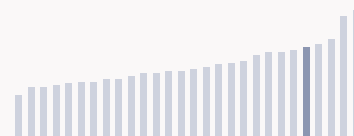
> Senegal ranks **93rd** among the 132 economies featured in the GII 2023.



> Senegal ranks **16th** among the 37 lower-middle-income group economies.



> Senegal ranks **5th** among the 28 economies in Sub-Saharan Africa.



> Senegal GII Ranking (2020-2023)

The table shows the rankings of Senegal 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 Senegal in the GII 2023 is between ranks 88 and 99.

	GII Position	Innovation Inputs	Innovation Outputs
2020	102nd	102nd	84th
2021	105th	105th	102nd
2022	99th	93rd	105th
2023	93rd	95th	93rd

Senegal performs better in innovation outputs than innovation inputs in 2023.

This year Senegal ranks 95th in innovation inputs. This position is lower than last year.

Senegal ranks 93rd in innovation outputs. This position is higher than last year.

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→ Expected vs. observed innovation performance

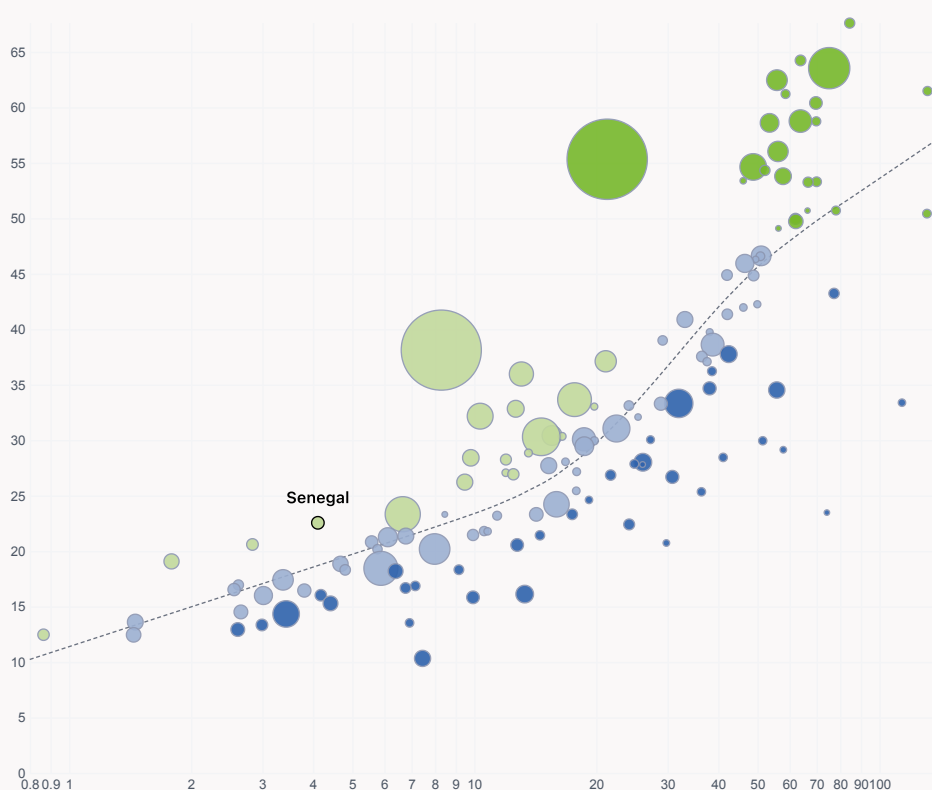
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected and those below are performing below expectations.



> Relative to GDP, Senegal is performing above expectations for its level of development.

> Innovation overperformers relative to their economic development

↑ **GII Score**



- Innovation leader
- Performing above expectations for level of development
- Performing at expectations for level of development
- Performing below expectations for level of development

Size legend (Population)



→ GDP per capita, PPP logarithmic scale (thousands of \$)

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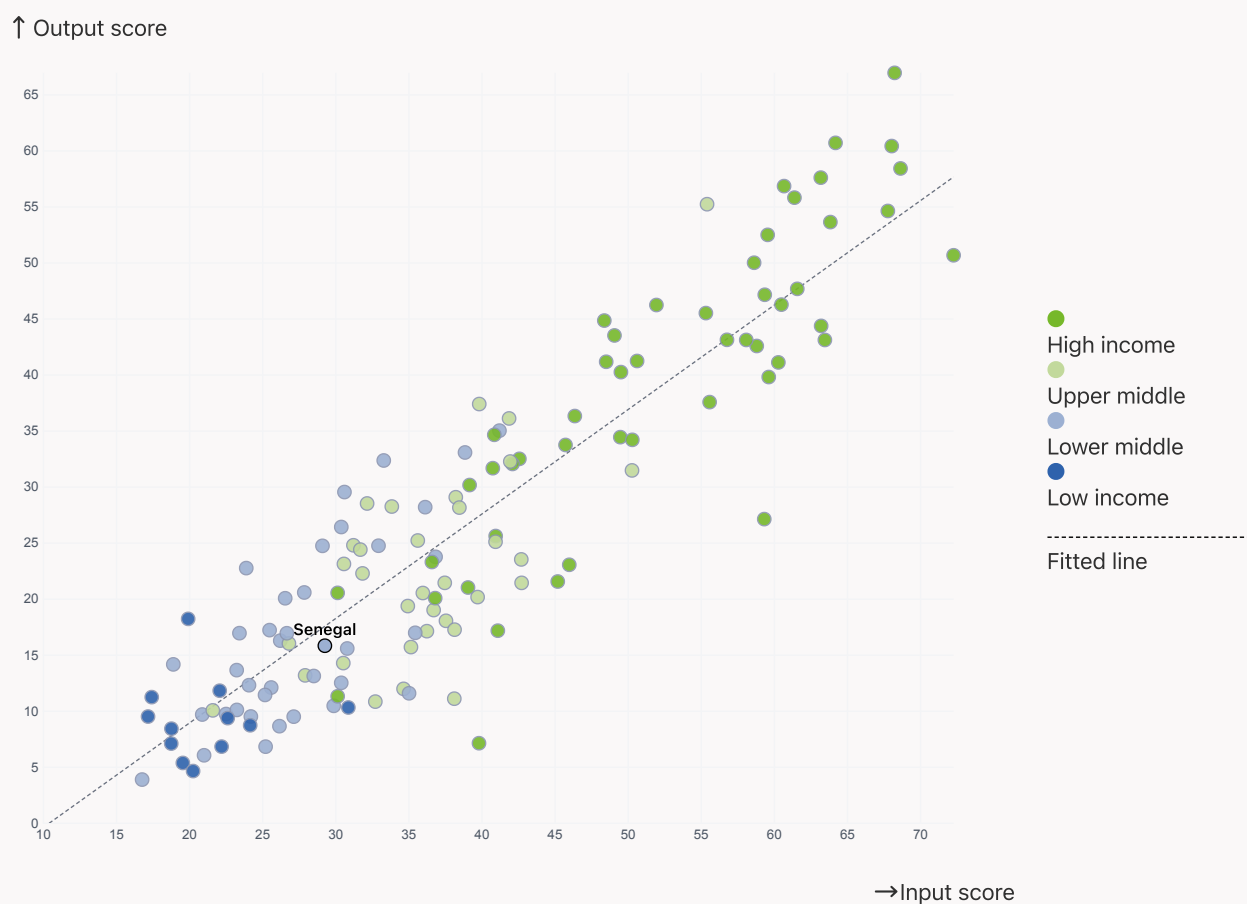
→ Effectively translating innovation investments into innovation outputs

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 more innovation outputs relative to its level of innovation investments.

> Relationship between innovation inputs and outputs



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→ Overview of Senegal's rankings in the seven areas of the GII in 2023

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

Highest rankings →

- 59th Institutions
- 63rd Knowledge and technology outputs

- 81st Market sophistication

- 93rd Global Innovation Index

- 98th Infrastructure

- 107th Human capital and research

- 113rd Creative outputs

← Lowest rankings

- 122nd Business sophistication

> Highest rankings



Senegal ranks highest in Institutions (59th), Knowledge and technology outputs (63rd) and Market sophistication (81st).

> Lowest rankings



Senegal ranks lowest in Business sophistication (122nd), Creative outputs (113rd) and Human capital and research (107th).



The full WIPO Intellectual Property Statistics profile for Senegal can be found on [this link](#).

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→ Benchmark of Senegal against other country groupings for each of the seven areas of the GII Index

The charts show the relative position of Senegal (blue bar) against other country groupings (grey bars), for each of the seven areas of the GII Index.

> Lower-Middle-Income economies

Senegal performs above the lower-middle-income group average in Knowledge and technology outputs, Market sophistication, Infrastructure, Institutions.



> Sub-Saharan Africa

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



Knowledge and technology outputs

Top 10 | Score: 58.96

Senegal | Score: 23.11

Lower middle income | Score: 17.21

Sub-Saharan Africa | Score: 12.16

Creative outputs

Top 10 | 56.09

Lower middle income | 16.35

Sub-Saharan Africa | 10.36

Senegal | 8.47

Business sophistication

Top 10 | 64.39

Lower middle income | 22.71

Sub-Saharan Africa | 19.85

Senegal | 16.48

Market sophistication

Top 10 | 61.93

Senegal | 30.66

Lower middle income | 28.01

Sub-Saharan Africa | 20.00

Human capital and research

Top 10 | 60.28

Lower middle income | 21.73

Senegal | 18.08

Sub-Saharan Africa | 17.80

Infrastructure

Top 10 | 62.83

Senegal | 29.25

Lower middle income | 27.83

Sub-Saharan Africa | 23.36

Institutions

Top 10 | 79.85

Senegal | 52.00

Sub-Saharan Africa | 43.27

Lower middle income | 39.43

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→ Innovation strengths and weaknesses in Senegal

The table below gives an overview of the indicator strengths and weaknesses of Senegal in the GII 2023.



> Senegal's main innovation strengths are **Unicorn valuation, % GDP (rank 1)**, **Gross capital formation, % GDP (rank 8)** and **Loans from microfinance institutions, % GDP (rank 10)**.

Strengths

Rank	Code	Indicator name
1	6.2.2	Unicorn valuation, % GDP
8	3.2.3	Gross capital formation, % GDP
10	4.1.3	Loans from microfinance institutions, % GDP
13	5.3.4	FDI net inflows, % GDP
19	4.2.4	VC received, value, % GDP
23	2.1.1	Expenditure on education, % GDP
32	7.2.1	Cultural and creative services exports, % total trade
37	4.2.3	VC recipients, deals/bn PPP\$ GDP
40	2.2.3	Tertiary inbound mobility, %

Weaknesses

Rank	Code	Indicator name
119	5.1.1	Knowledge-intensive employment, %
117	5.1.5	Females employed w/advanced degrees, %
116	7.3.4	Mobile app creation/bn PPP\$ GDP
114	3.2.1	Electricity output, GWh/mn pop.
108	2.1.3	School life expectancy, years
101	6.1.2	PCT patents by origin/bn PPP\$ GDP
87	5.1.2	Firms offering formal training, %
75	6.1.3	Utility models by origin/bn PPP\$ GDP
71	2.3.4	QS university ranking, top 3
40	2.3.3	Global corporate R&D investors, top 3, mn US\$

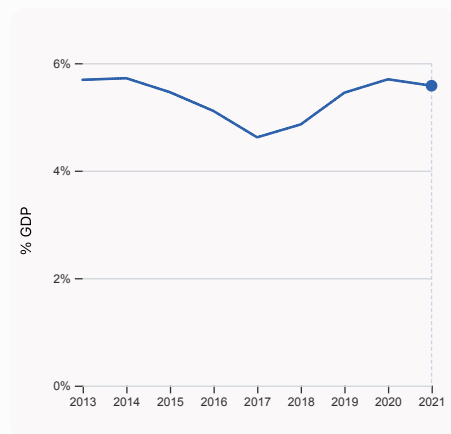
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→ Senegal's innovation system

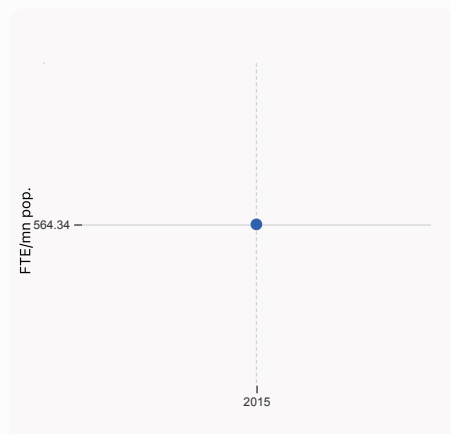
As far as practicable, the plots below present unscaled indicator data.

> Innovation inputs in Senegal



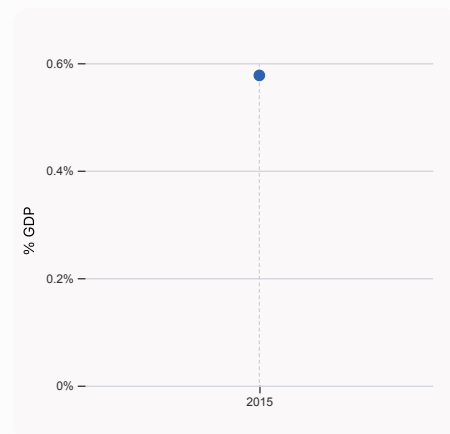
2.1.1 Expenditure on education, % GDP

was equal to 5.58% GDP in 2021, down by 0.12 percentage points from the year prior – and equivalent to an indicator rank of 23.



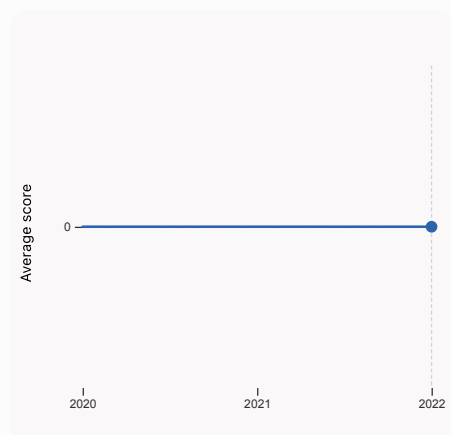
2.3.1 Researchers, FTE/mn pop.

was equal to 564.34 FTE/mn pop. in 2015, equivalent to an indicator rank of 68.



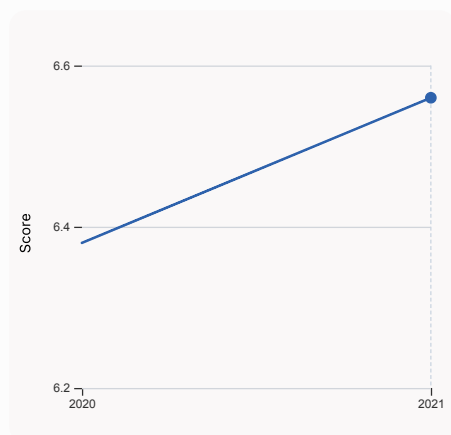
2.3.2 Gross expenditure on R&D, % GDP

was equal to 0.58 % GDP in 2015, equivalent to an indicator rank of 56.



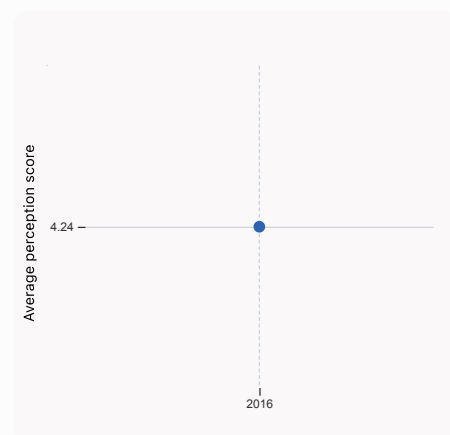
2.3.4 QS university ranking, top 3

was equal to an average score of 0 for the top 3 universities in 2022, equivalent to an indicator rank of 71.



3.1.1 ICT access

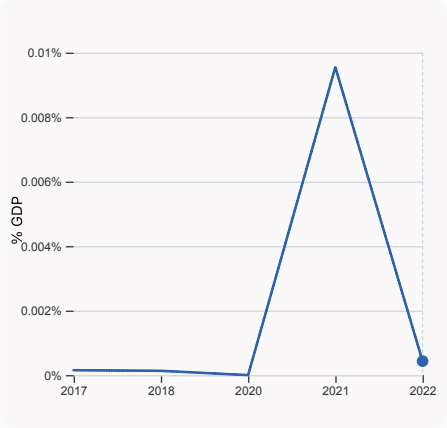
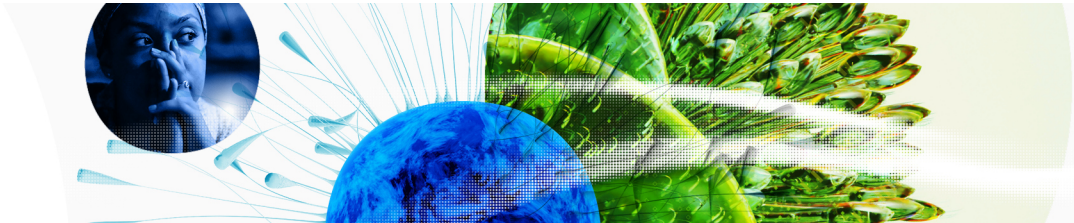
was equal to a score of 6.56 in 2021, up by 2.82% from the year prior – and equivalent to an indicator rank of 111.



4.1.1 Finance for startups and scaleups

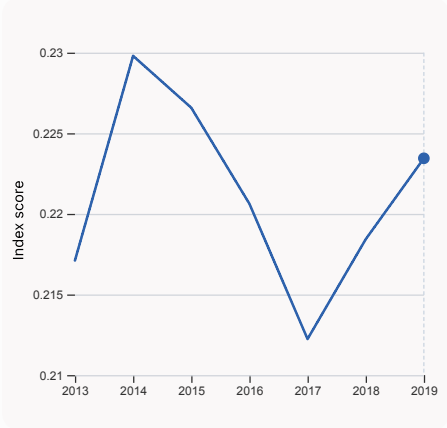
was equal to an average perception score of 4.24 in 2016, equivalent to an indicator rank of 56.

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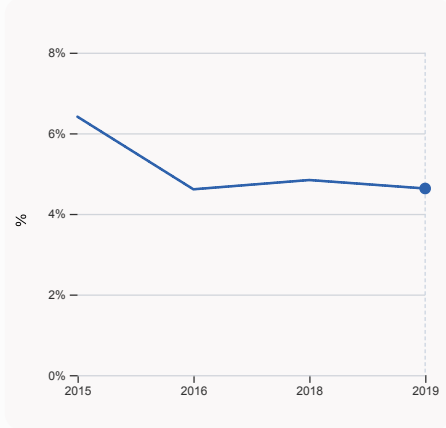
4.2.4 VC received, value, % GDP

was equal to 0.00043% GDP in 2022, down by 0.0091 percentage points from the year prior – and equivalent to an indicator rank of 19.



4.3.2 Domestic industry diversification

was equal to an index score of 0.223 in 2019, up by 2.3% from the year prior – and equivalent to an indicator rank of 77.



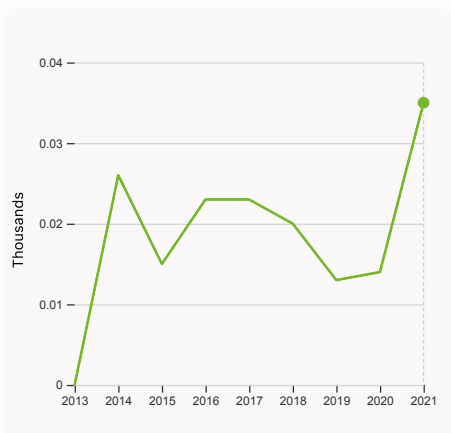
5.1.1 Knowledge-intensive employment, %

was equal to 4.63% in 2019, down by 0.21 percentage points from the year prior – and equivalent to an indicator rank of 119.

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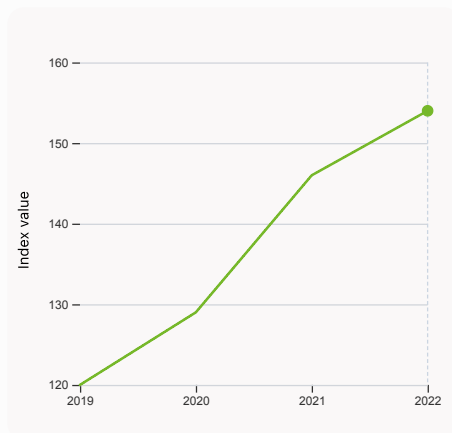


> Innovation outputs in Senegal



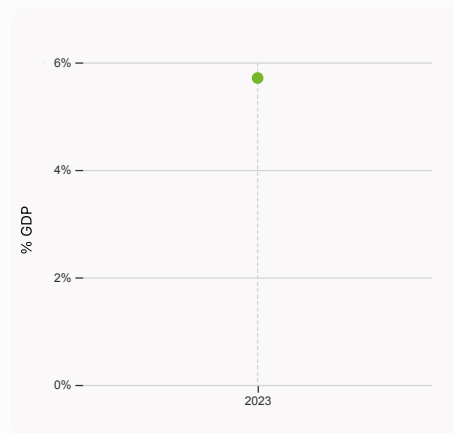
6.1.1 Patents by origin

was equal to 0.035 Thousands in 2021, up by 150.00000000000003% from the year prior – and equivalent to an indicator rank of 77.



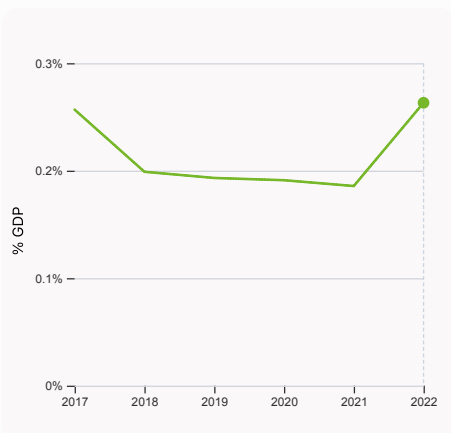
6.1.5 Citable documents H-index

was equal to an index value of 154 in 2022, up by 5.48% from the year prior – and equivalent to an indicator rank of 93.



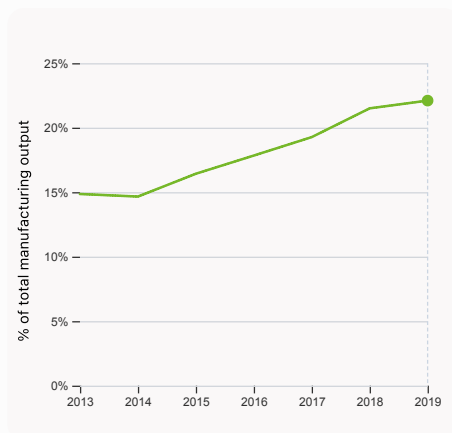
6.2.2 Unicorn valuation, % GDP

was equal to 5.71 % GDP in 2023 – and equivalent to an indicator rank of 1.



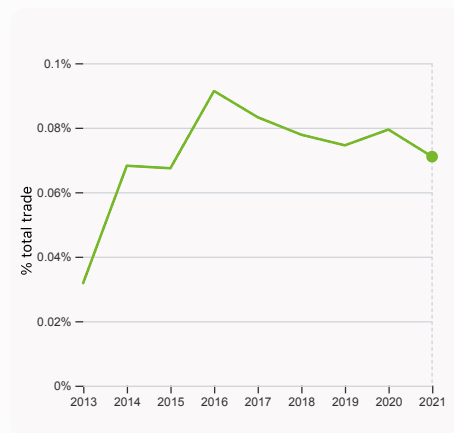
6.2.3 Software spending, % GDP

was equal to 0.263% GDP in 2022, up by 0.077 percentage points from the year prior – and equivalent to an indicator rank of 54.



6.2.4 High-tech manufacturing, %

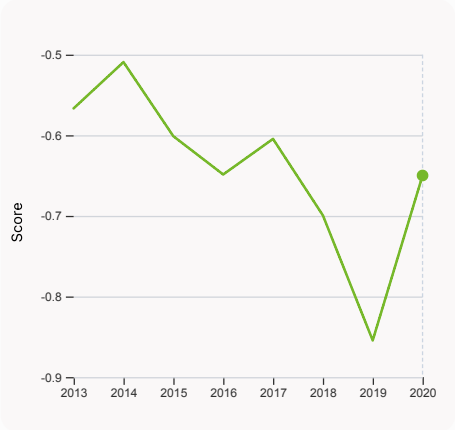
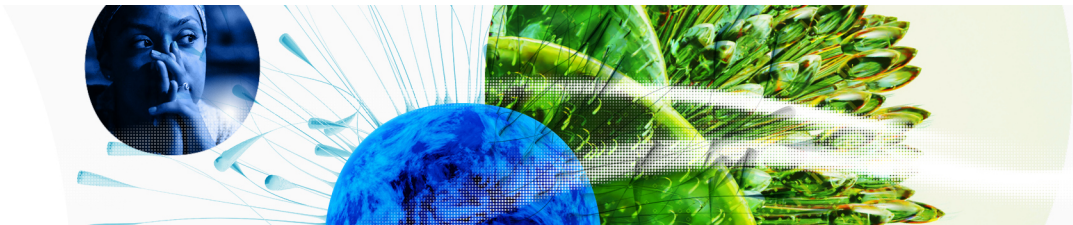
was equal to 22.1% of total manufacturing output in 2019, up by 0.6 percentage points from the year prior – and equivalent to an indicator rank of 59.



6.3.1 Intellectual property receipts, % total trade

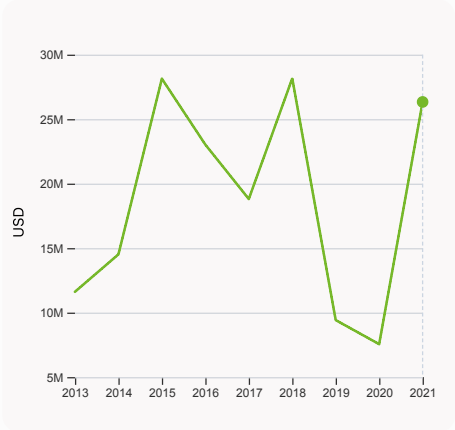
was equal to 0.071% total trade in 2021, down by 0.0084 percentage points from the year prior – and equivalent to an indicator rank of 64.

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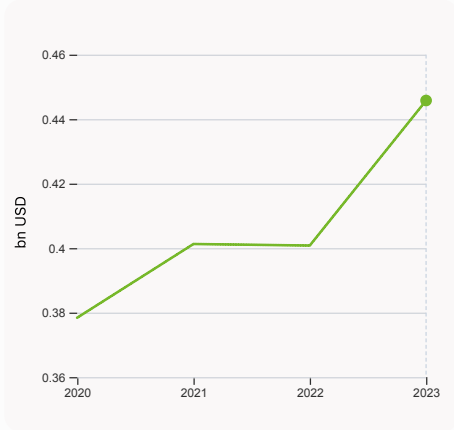
6.3.2 Production and export complexity

was equal to a score of -0.65 in 2020, up by 23.94% from the year prior – and equivalent to an indicator rank of 95.



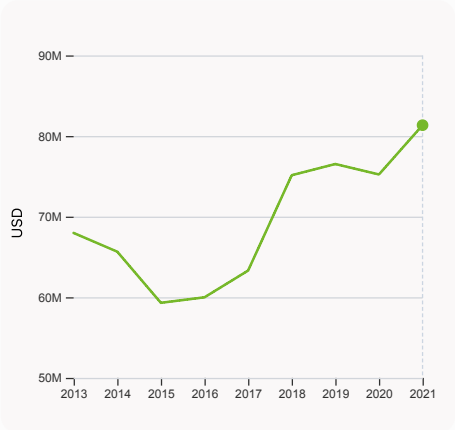
6.3.3 High-tech exports

was equal to 26,333,275 USD in 2021, up by 248.51% from the year prior – and equivalent to an indicator rank of 97.



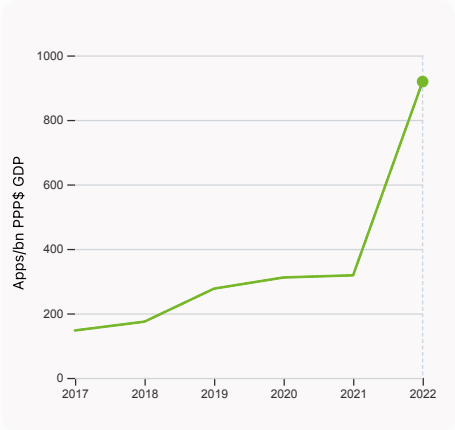
7.1.3 Global brand value, top 5,000

was equal to 0.446 bn USD in 2023, up by 11.22% from the year prior – and equivalent to an indicator rank of 48.



7.2.1 Cultural and creative services exports

was equal to 81,347,000 USD in 2021, up by 8.13% from the year prior – and equivalent to an indicator rank of 32.



7.3.4 Mobile app creation/bn PPP\$ GDP

was equal to 918.83 Apps/bn PPP\$ GDP in 2022, up by 188.86% from the year prior – and equivalent to an indicator rank of 116.



→ Senegal's innovation top performers

Data not available.

> 6.2.2 Top Unicorn Companies in Senegal

Rank	Unicorn Company	Industry	City	Valuation, bn USD
1	WAVE	Fintech	Dakar	2

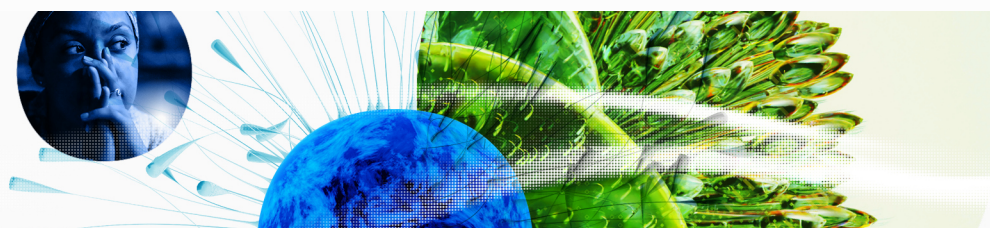
Source: CBInsights, Tracker – The Complete List of Unicorn Companies: <https://www.cbinsights.com/research-unicorn-companies>

> 7.1.3 Top 5,000 companies in Senegal with highest global brand value

Rank	Brand	Industry	Brand Value, mn USD
1	SONATEL	Telecoms	445.8

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

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GII 2023 rank

93

Senegal

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
93	95	Lower middle	SSA	17.3	72.7	4,113.1

Score / Value Rank

Score / Value Rank

Institutions 52.0 59

1.1 Institutional environment	48.4	57
1.1.1 Operational stability for businesses*	58.3	49
1.1.2 Government effectiveness*	38.4	65
1.2 Regulatory environment	59.0	76
1.2.1 Regulatory quality*	34.0	88
1.2.2 Rule of law*	29.0	85
1.2.3 Cost of redundancy dismissal	14.8	59
1.3 Business environment	48.6	58
1.3.1 Policies for doing business*	43.2	76
1.3.2 Entrepreneurship policies and culture*	54.0	27

Human capital and research 18.1 107

2.1 Education	38.2	103
2.1.1 Expenditure on education, % GDP	5.6	23 ●
2.1.2 Government funding/pupil, secondary, % GDP/cap	20.2	52
2.1.3 School life expectancy, years	9.0	108 ○ ◇
2.1.4 PISA scales in reading, maths and science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	24.5	108
2.2 Tertiary education	12.1	107
2.2.1 Tertiary enrolment, % gross	15.6	104
2.2.2 Graduates in science and engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	6.3	40 ●
2.3 Research and development (R&D)	4.0	80
2.3.1 Researchers, FTE/mn pop.	564.3	68
2.3.2 Gross expenditure on R&D, % GDP	0.6	56
2.3.3 Global corporate R&D investors, top 3, mn US\$	0.0	40 ○ ◇
2.3.4 QS university ranking, top 3*	0.0	71 ○ ◇

Infrastructure 29.2 98

3.1 Information and communication technologies (ICTs)	45.0	106
3.1.1 ICT access*	48.1	111
3.1.2 ICT use*	55.4	98
3.1.3 Government's online service*	44.0	100
3.1.4 E-participation*	32.6	100
3.2 General infrastructure	24.0	77
3.2.1 Electricity output, GWh/mn pop.	346.4	114 ○
3.2.2 Logistics performance*	n/a	n/a
3.2.3 Gross capital formation, % GDP	40.2	8 ●
3.3 Ecological sustainability	18.8	86
3.3.1 GDP/unit of energy use	12.0	48
3.3.2 Environmental performance*	25.4	98
3.3.3 ISO 14001 environment/bn PPP\$ GDP	0.3	97

Market sophistication 30.7 81

4.1 Credit	30.2	66
4.1.1 Finance for startups and scaleups*	42.9	56
4.1.2 Domestic credit to private sector, % GDP	29.4	98
4.1.3 Loans from microfinance institutions, % GDP	3.3	10 ●
4.2 Investment	20.9	34
4.2.1 Market capitalization, % GDP	n/a	n/a
4.2.2 Venture capital (VC) investors, deals/bn PPP\$ GDP	0.1	45
4.2.3 VC recipients, deals/bn PPP\$ GDP	0.1	37 ●
4.2.4 VC received, value, % GDP	0.0	19 ●
4.3 Trade, diversification, and market scale	40.9	101
4.3.1 Applied tariff rate, weighted avg., %	9.1	112
4.3.2 Domestic industry diversification	80.0	77
4.3.3 Domestic market scale, bn PPP\$	72.7	95

Business sophistication 16.5 122 ◇

5.1 Knowledge workers	5.7	126 ◇
5.1.1 Knowledge-intensive employment, %	4.6	119 ○ ◇
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	117 ○
5.2 Innovation linkages	16.4	92
5.2.1 University-industry R&D collaboration*	45.1	62
5.2.2 State of cluster development*	25.4	105
5.2.3 GERD financed by abroad, % GDP	0.0	51
5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP	0.0	97
5.2.5 Patent families/bn PPP\$ GDP	0.0	70
5.3 Knowledge absorption	27.3	90
5.3.1 Intellectual property payments, % total trade	0.1	98
5.3.2 High-tech imports, % total trade	5.0	115
5.3.3 ICT services imports, % total trade	1.3	68
5.3.4 FDI net inflows, % GDP	6.7	13 ●
5.3.5 Research talent, % in businesses	n/a	n/a

Knowledge and technology outputs 23.1 63

6.1 Knowledge creation	6.0	107
6.1.1 Patents by origin/bn PPP\$ GDP	0.5	77
6.1.2 PCT patents by origin/bn PPP\$ GDP	0.0	101 ○ ◇
6.1.3 Utility models by origin/bn PPP\$ GDP	0.0	75 ○ ◇
6.1.4 Scientific and technical articles/bn PPP\$ GDP	n/a	n/a
6.1.5 Citable documents H-index	6.2	93
6.2 Knowledge impact	51.0	13
6.2.1 Labor productivity growth, %	0.9	69
6.2.2 Unicorn valuation, % GDP	5.7	1 ●
6.2.3 Software spending, % GDP	0.3	54
6.2.4 High-tech manufacturing, %	22.1	59
6.3 Knowledge diffusion	12.3	97
6.3.1 Intellectual property receipts, % total trade	0.1	64
6.3.2 Production and export complexity	38.9	95
6.3.3 High-tech exports, % total trade	0.3	97
6.3.4 ICT services exports, % total trade	1.4	72
6.3.5 ISO 9001 quality/bn PPP\$ GDP	1.2	102

Creative outputs 8.5 113

7.1 Intangible assets	7.0	113
7.1.1 Intangible asset intensity, top 15, %	n/a	n/a
7.1.2 Trademarks by origin/bn PPP\$ GDP	11.1	110
7.1.3 Global brand value, top 5,000	1.5	48
7.1.4 Industrial designs by origin/bn PPP\$ GDP	0.4	89
7.2 Creative goods and services	10.4	65
7.2.1 Cultural and creative services exports, % total trade	0.9	32 ●
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	85
7.3 Online creativity	9.4	117
7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	1.1	96
7.3.2 Country-code TLDs/th pop. 15-69	0.2	110
7.3.3 GitHub commits/mn pop. 15-69	0.9	114
7.3.4 Mobile app creation/bn PPP\$ GDP	35.4	116 ○ ◇

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/gii-ranking>. 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.



> Senegal has missing data for nine indicators and outdated data for thirteen indicators.

> Missing data for Senegal

Code	Indicator name	Economy Year	Model Year	Source
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; Eurostat; OECD
3.2.2	Logistics performance	n/a	2023	World Bank, Logistics Performance Index 2023 (https://lpi.worldbank.org/); and World Bank 2023, Connecting to Compete 2023: Trade Logistics in the Global Economy — The Logistics Performance Index and its Indicators.
4.2.1	Market capitalization, % GDP	n/a	2020	World Federation of Exchanges; World Bank
5.1.3	GERD performed by business, % GDP	n/a	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.3.5	Research talent, % in businesses	n/a	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
7.1.1	Intangible asset intensity, top 15, %	n/a	2022	Brand Finance
7.2.2	National feature films/mn pop. 15-69	n/a	2021	OMDIA; United Nations, World Population Prospects
7.2.3	Entertainment and media market/th pop. 15-69	n/a	2022	PwC, GEMO; United Nations, World Population Prospects; International Monetary Fund

> Outdated data for Senegal

Code	Indicator name	Economy Year	Model Year	Source
1.3.2	Entrepreneurship policies and culture	2016	2022	Global Entrepreneurship Monitor
2.1.2	Government funding/pupil, secondary, % GDP/cap	2015	2019	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2015	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
2.3.2	Gross expenditure on R&D, % GDP	2015	2021	UNESCO Institute for Statistics; Eurostat; OECD; RICYT

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Code	Indicator name	Economy Year	Model Year	Source
3.2.1	Electricity output, GWh/mn pop.	2020	2021	International Energy Agency
4.1.1	Finance for startups and scaleups	2016	2022	Global Entrepreneurship Monitor
4.3.2	Domestic industry diversification	2019	2020	United Nations Industrial Development Organization
5.1.1	Knowledge-intensive employment, %	2019	2022	International Labour Organization
5.1.2	Firms offering formal training, %	2014	2019	World Bank Enterprise Surveys
5.1.4	GERD financed by business, %	2015	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.1.5	Females employed w/advanced degrees, %	2019	2022	International Labour Organization
5.2.3	GERD financed by abroad, % GDP	2015	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
6.2.4	High-tech manufacturing, %	2019	2020	United Nations Industrial Development Organization

Global Innovation Index 2023



→ 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.