GLOBAL INNOVATION INDEX 2019

SENEGAL

96th   Senegal ranks 96th among the 129 economies featured in the GII 2019.

The Global Innovation Index (GII) is a ranking of world economies based on 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 the GII model influence year-on-year comparisons of the GII ranks. The confidence interval for Senegal's ranking in the GII 2019 is between 90 and 99.

Senegal's Rankings, 2017 - 2019

	GII	Innovation Inputs	Innovation Outputs
2019	96	103	81
2018	100	102	90
2017	100	102	98

- Senegal performs better in Innovation Outputs than Inputs in 2019.
- This year Senegal ranks 103rd in Innovation Inputs, worse than last year and compared to 2017.
- As for Innovation Outputs, Senegal ranks 81st. This position is better than last year and compared to 2017.

2nd   Senegal ranks 2nd among the 19 low-income economies.

6th   Senegal ranks 6th among the 26 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 considered Innovation under-performers relative to GDP.

Relative to GDP, Senegal performs at its expected level of development.

GII scores and GDP per capita in PPP US$
**(bubbles sized by population)**
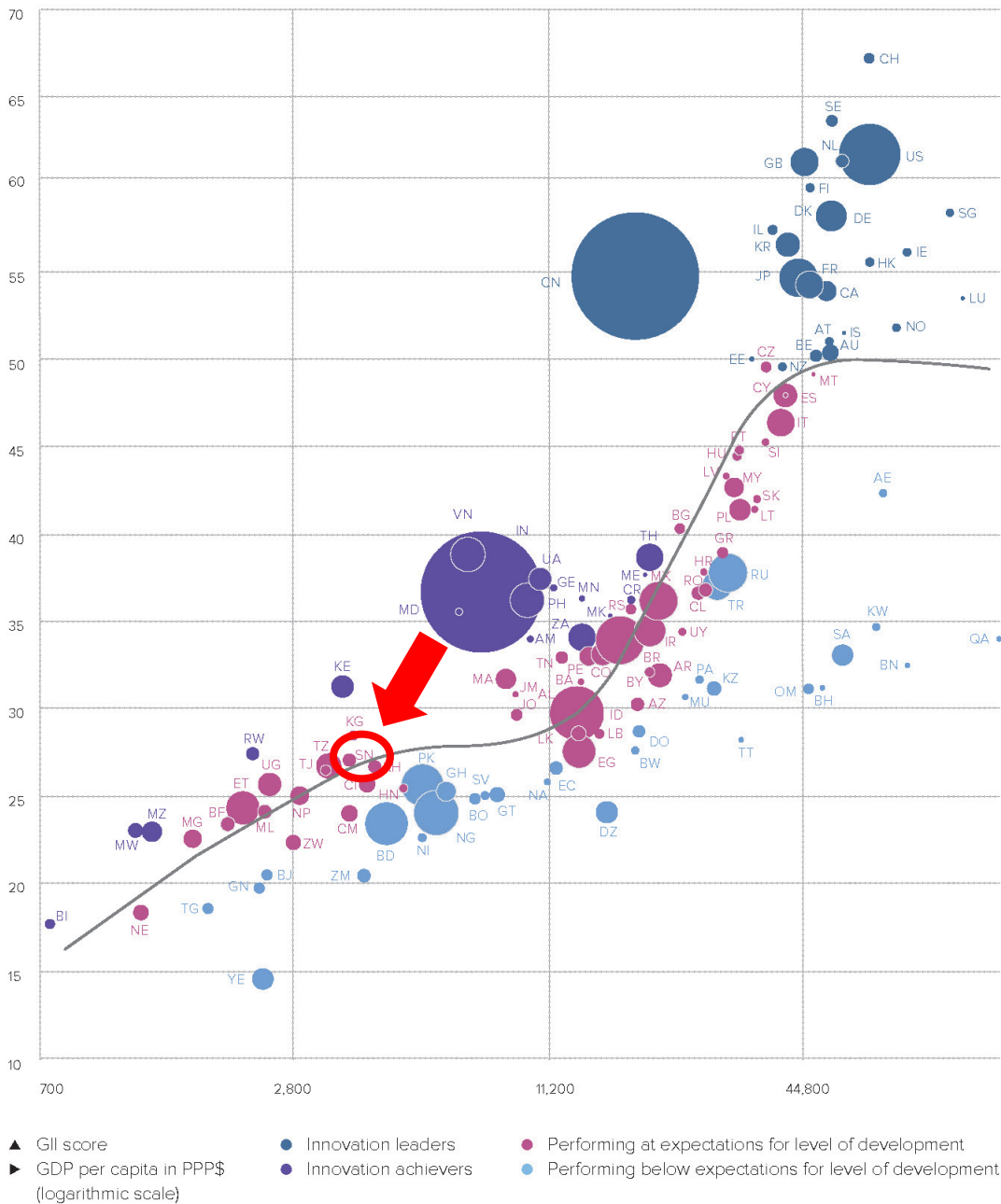
EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

The chart below shows the relationship between innovation inputs and innovation outputs, indicating which economies best translate innovation inputs into innovation outputs. Economies appearing above the line are effectively translating their costly innovation investments into more and higher-quality outputs. In contrast, those below the line are not effectively translating innovation inputs into outputs.

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

Innovation input/output performance by income group, 2019
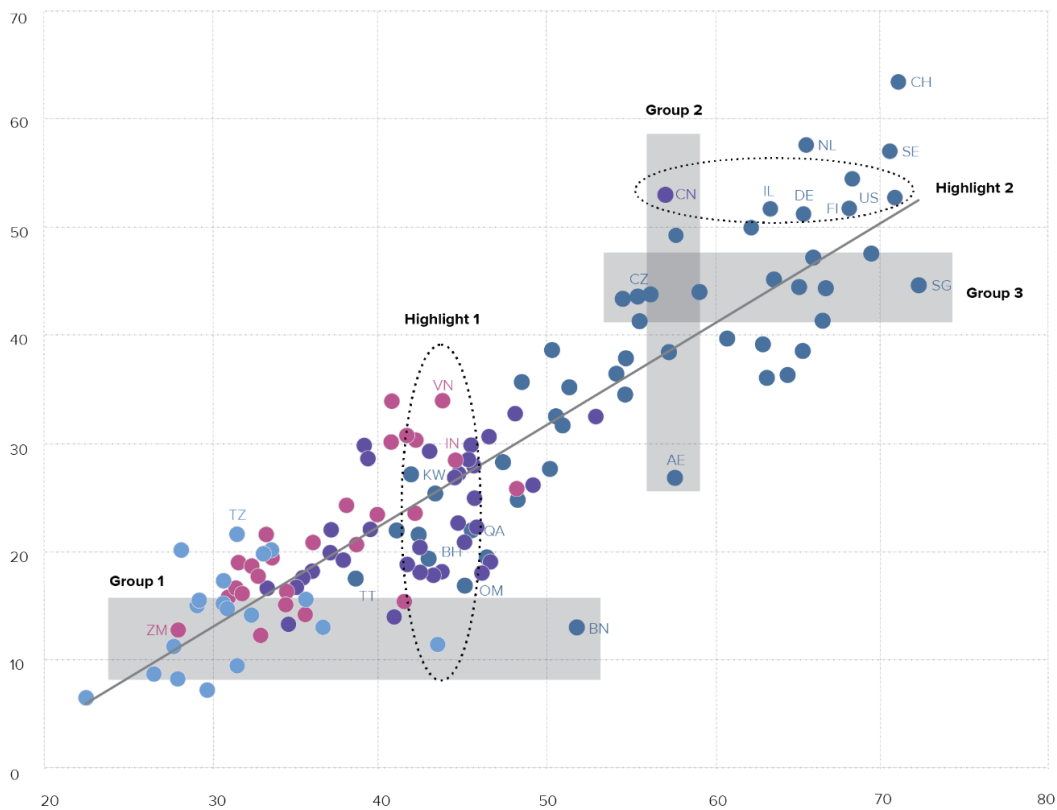
▲	Output score	●	High income	●	Lower-middle income	—	Fitted values
▶	Input score	●	Upper-middle income	●	Low income		

AE	United Arab Emirates	CZ	Czech Republic	NL	Netherlands	TZ	United Republic of Tanzania
BH	Bahrain	DE	Germany	OM	Oman		
BN	Brunei Darussalam	FI	Finland	QA	Qatar	US	United States of America
CH	Switzerland	IL	Israel	SE	Sweden	VN	Viet Nam
CN	China	IN	India	SG	Singapore	ZM	Zambia
		KW	Kuwait	TT	Trinidad and Tobago		

Source: Global Innovation Index Database, Cornell, INSEAD, and WIPO, 2019.

BENCHMARKING SENEGAL TO OTHER LOW-INCOME ECONOMIES AND THE SUB-SAHARAN AFRICA REGION

Senegal's scores in the seven GII pillars

Senegal — Low-income — Sub-Saharan Africa — Top 10
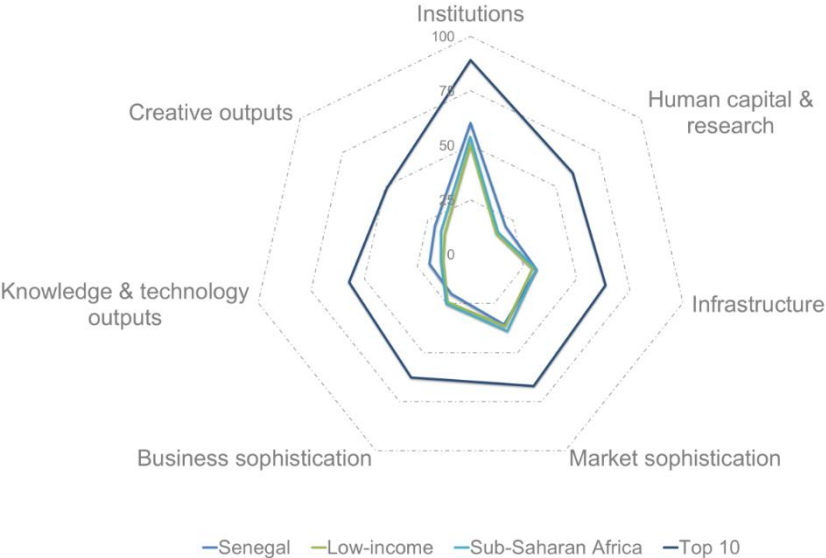
Low-income economies

Senegal has high scores in 5 out of the 7 GII pillars: Institutions, Human capital & research, Infrastructure, Knowledge & technology outputs, and Creative outputs, which are above the average of the low-income group.

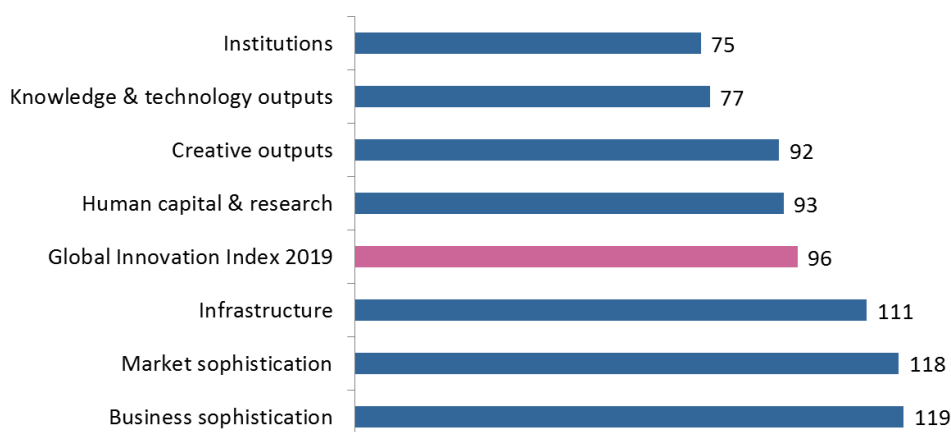### Sub-Saharan Africa Region

Compared to other economies in Sub-Saharan Africa, Senegal performs above average in 5 out of the 7 GII pillars: Institutions, Human capital & research, Infrastructure, Knowledge & technology outputs, and Creative outputs.

Top ranks are found in areas such as Regulatory environment, Investment, and Knowledge diffusion where the country ranks in the top 70 worldwide.

OVERVIEW OF SENEGAL'S RANKINGS IN THE 7 GII AREAS

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

Area	Rank
Institutions	75
Knowledge & technology outputs	77
Creative outputs	92
Human capital & research	93
Global Innovation Index 2019	96
Infrastructure	111
Market sophistication	118
Business sophistication	119

*The highest possible ranking in each pillar is 1.

SENEGAL'S INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of Senegal's strengths and weaknesses in the GII 2019.

Strengths

Code	Indicator name	Rank
2.1.1	Expenditure on education, % GDP	19
2.2.3	Tertiary inbound mobility, %	25
3.2.3	Gross capital formation, % GDP	40
4.1.3	Microfinance gross loans, % GDP	17
5.3.3	ICT services imports, % total trade	12
6.2.1	Growth rate of PPP$ GDP/worker, %, 3-year average	19
6.2.3	Computer software spending, % GDP	40
6.3.3	ICT services exports, % total trade	12
7.1.3	ICTs & business model creation†	51
7.2.1	Cultural & creative services exports, % total trade	30

Weaknesses

Code	Indicator name	Rank
2.1.3	School life expectancy, years	111
2.3.3	Global R&D companies, top 3, in mn US$	43
2.3.4	QS university ranking, average score top 3*	78
3.2.2	Logistics performance*	118
4.1.1	Ease of getting credit*	115
4.3.1	Applied tariff rate, weighted mean, %	123
5.1	Knowledge workers	123
5.1.3	GERD performed by business, % GDP	87
5.2.5	Patent families 2+ offices/bn PPP$ GDP	93
5.3.5	Research talent, % in business enterprise	86
7.2.2	National feature films/mn pop. 15–69	104

STRENGTHS

- GII strengths for Senegal are found in six of the seven GII pillars.
- In Human capital & research (93), Senegal's strengths are indicators Expenditure on education (19) and Tertiary inbound mobility (25).
- In Infrastructure (111), indicator Gross capital formation (40) is a GII strength for Senegal.
- In Market sophistication (118), indicator Microfinance gross loans (17) is one of Senegal's relative strengths.
- In Business sophistication (119), Senegal's strength is found in indicator ICT services imports (12).
- In Knowledge & technology outputs (77), three indicators – Labor productivity growth (19), Computer software spending (40), and ICT services exports (12) – are relative strengths of the country.
- In Creative outputs (92), Senegal presents two strengths in indicators ICTs & business model creation (51) and Cultural & creative services exports (30).

WEAKNESSES

- Senegal's weaknesses in the GII are found in five of the seven GII pillars.
- Four of them are in Business sophistication (119). These are sub-pillar Knowledge workers (123) and three indicators: R&D performed by business (87), Patent families in two or more offices (93), and Research talent (86).
- Three additional strengths are in Human capital & research (93), where weaknesses are indicators School life expectancy (111), Global R&D companies (43), and Quality of universities (78).
- The other relative weakness of Senegal are indicators:
  - Logistics performance (118) in Infrastructure (111);
  - Ease of getting credit (115) and Applied tariff rate (123) in Market sophistication (118); and
  - National feature film (104) in Creative outputs (92).

SENEGAL

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$	GDP per capita, PPP$	GII 2018 rank
81	**103**	**Low**	**SSF**	**16.3**	**60.0**	**3,651.2**	**100**

		Score/Value	Rank	
📗	**INSTITUTIONS**..	**60.4**	**75**	◆
1.1	**Political environment**...	**49.3**	**86**	◆
1.1.1	Political and operational stability*........................	70.2	61	◆
1.1.2	Government effectiveness*...................................	38.8	89	◆
1.2	**Regulatory environment**....................................	**64.9**	**67**	
1.2.1	Regulatory quality*..	38.0	80	◆
1.2.2	Rule of law*...	42.4	68	◆
1.2.3	Cost of redundancy dismissal, salary weeks.............	14.8	59	
1.3	**Business environment**.......................................	**67.1**	**73**	
1.3.1	Ease of starting a business*.................................	89.9	54	
1.3.2	Ease of resolving insolvency*...............................	44.3	84	

		Score/Value	Rank	
👥	**HUMAN CAPITAL & RESEARCH**......................	**20.6**	**93**	◆
2.1	**Education**...	**36.8**	**97**	
2.1.1	Expenditure on education, % GDP.........................	6.2	19	● ◆
2.1.2	Government funding/pupil, secondary, % GDP/cap..	15.2	83	
2.1.3	School life expectancy, years...............................	9.0	111	○
2.1.4	PISA scales in reading, maths, & science................	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary.............................	18.9	83	
2.2	**Tertiary education**...	**19.4**	**96**	
2.2.1	Tertiary enrolment, % gross..................................	11.2	106	
2.2.2	Graduates in science & engineering, %..................	n/a	n/a	
2.2.3	Tertiary inbound mobility, %.................................	8.3	25	● ◆
2.3	**Research & development (R&D)**..........................	**5.7**	**74**	◆
2.3.1	Researchers, FTE/mn pop.⊕..................................	549.3	65	◆
2.3.2	Gross expenditure on R&D, % GDP.⊕.....................	0.8	48	◆
2.3.3	Global R&D companies, avg. exp. top 3, mn US$......	0.0	43	○ ◇
2.3.4	QS university ranking, average score top 3*............	0.0	78	○ ◇

		Score/Value	Rank	
🔧	**INFRASTRUCTURE**.......................................	**31.1**	**111**	
3.1	**Information & communication technologies(ICTs)**	**39.0**	**106**	
3.1.1	ICT access*..	38.4	106	◆
3.1.2	ICT use*..	19.2	109	
3.1.3	Government's online service*................................	47.9	106	
3.1.4	E-participation*...	50.6	103	
3.2	**General infrastructure**......................................	**24.2**	**103**	
3.2.1	Electricity output, kWh/mn pop............................	289.2	112	
3.2.2	Logistics performance*...	8.8	118	○
3.2.3	Gross capital formation, % GDP............................	25.9	40	●
3.3	**Ecological sustainability**...................................	**30.1**	**94**	
3.3.1	GDP/unit of energy use..	8.3	70	
3.3.2	Environmental performance*................................	49.5	100	◆
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP..	0.3	105	

		Score/Value	Rank	
📊	**MARKET SOPHISTICATION**............................	**35.6**	**118**	
4.1	**Credit**..	**20.7**	**116**	
4.1.1	Ease of getting credit*...	30.0	115	○
4.1.2	Domestic credit to private sector, % GDP..............	29.5	96	
4.1.3	Microfinance gross loans, % GDP..........................	1.2	17	●
4.2	**Investment**..	**41.7**	**[65]**	
4.2.1	Ease of protecting minority investors*...................	41.7	108	
4.2.2	Market capitalization, % GDP................................	n/a	n/a	
4.2.3	Venture capital deals/bn PPP$ GDP.......................	n/a	n/a	
4.3	**Trade, competition, & market scale**....................	**44.3**	**119**	
4.3.1	Applied tariff rate, weighted avg., %.....................	12.3	123	○
4.3.2	Intensity of local competition†.............................	68.0	68	◆
4.3.3	Domestic market scale, bn PPP$...........................	60.0	93	

		Score/Value	Rank	
📈	**BUSINESS SOPHISTICATION**...........................	**20.2**	**119**	
5.1	**Knowledge workers**..	**9.1**	**123**	○
5.1.1	Knowledge-intensive employment, %.⊕.................	6.4	106	
5.1.2	Firms offering formal training, % firms..................	17.4	81	
5.1.3	GERD performed by business, % GDP.⊕..................	0.0	87	○
5.1.4	GERD financed by business, %.⊕...........................	2.1	88	
5.1.5	Females employed w/advanced degrees, %.⊕..........	1.8	102	
5.2	**Innovation linkages**..	**21.5**	**78**	
5.2.1	University/industry research collaboration†............	39.8	71	
5.2.2	State of cluster development†...............................	40.3	92	
5.2.3	GERD financed by abroad, %.⊕..............................	7.9	49	
5.2.4	JV-strategic alliance deals/bn PPP$ GDP................	n/a	n/a	
5.2.5	Patent families 2+ offices/bn PPP$ GDP.................	0.0	93	○ ◇
5.3	**Knowledge absorption**.......................................	**29.9**	**83**	
5.3.1	Intellectual property payments, % total trade.........	0.1	95	
5.3.2	High-tech imports, % total trade...........................	5.9	93	
5.3.3	ICT services imports, % total trade........................	2.6	12	● ◆
5.3.4	FDI net inflows, % GDP...	2.4	71	
5.3.5	Research talent, % in business enterprise.⊕............	0.1	86	○ ◇

		Score/Value	Rank	
🖥	**KNOWLEDGE & TECHNOLOGY OUTPUTS**....	**19.4**	**77**	◆
6.1	**Knowledge creation**..	**5.1**	**96**	
6.1.1	Patents by origin/bn PPP$ GDP.............................	0.4	80	◆
6.1.2	PCT patents by origin/bn PPP$ GDP.......................	0.1	71	◆
6.1.3	Utility models by origin/bn PPP$ GDP....................	n/a	n/a	
6.1.4	Scientific & technical articles/bn PPP$ GDP............	4.0	93	
6.1.5	Citable documents H-index...................................	5.9	90	
6.2	**Knowledge impact**..	**34.7**	**75**	
6.2.1	Growth rate of PPP$ GDP/worker, %......................	3.4	19	●
6.2.2	New businesses/th pop. 15-64..............................	0.4	90	
6.2.3	Computer software spending, % GDP.....................	0.3	40	● ◆
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP............	0.9	108	
6.2.5	High- & medium-high-tech manufactures, %.⊕........	0.2	63	◆
6.3	**Knowledge diffusion**...	**18.3**	**58**	◆
6.3.1	Intellectual property receipts, % total trade............	0.1	61	
6.3.2	High-tech net exports, % total trade......................	0.3	89	◆
6.3.3	ICT services exports, % total trade........................	4.4	12	● ◆
6.3.4	FDI net outflows, % GDP.......................................	0.5	65	

		Score/Value	Rank	
🏆	**CREATIVE OUTPUTS**.....................................	**20.8**	**92**	
7.1	**Intangible assets**..	**36.9**	**85**	
7.1.1	Trademarks by origin/bn PPP$ GDP.......................	11.4	103	
7.1.2	Industrial designs by origin/bn PPP$ GDP..............	0.8	75	
7.1.3	ICTs & business model creation†...........................	65.3	51	● ◆
7.1.4	ICTs & organizational model creation†...................	58.1	52	◆
7.2	**Creative goods & services**.................................	**9.0**	**90**	
7.2.1	Cultural & creative services exports, % total trade....	0.9	30	● ◆
7.2.2	National feature films/mn pop. 15-69.....................	0.2	104	○ ◇
7.2.3	Entertainment & Media market/th pop. 15-69..........	n/a	n/a	
7.2.4	Printing & other media, % manufacturing.⊕............	0.8	74	◇
7.2.5	Creative goods exports, % total trade.....................	0.1	102	
7.3	**Online creativity**..	**0.4**	**109**	
7.3.1	Generic top-level domains (TLDs)/th pop. 15-69......	1.0	95	◆
7.3.2	Country-code TLDs/th pop. 15-69..........................	0.1	111	
7.3.3	Wikipedia edits/mn pop. 15-69.⊕...........................	0.2	114	
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 II 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 missing or are outdated for Senegal.

Missing data

Code	Indicator name	Country year	Model year	Source
2.1.4	PISA scales in reading, maths & science	n/a	2015	OECD Programme for International Student Assessment (PISA)
2.2.2	Graduates in science & engineering, %	n/a	2016	UNESCO Institute for Statistics
4.2.2	Market capitalization, % GDP	n/a	2017	World Federation of Exchanges
4.2.3	Venture capital deals/bn PPP$ GDP	n/a	2018	Thomson Reuters
5.2.4	JV–strategic alliance deals/bn PPP$ GDP	n/a	2018	Thomson Reuters
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	2017	World Intellectual Property Organization
7.2.3	Entertainment & Media market/th pop. 15–69	n/a	2017	PwC
7.3.4	Mobile app creation/bn PPP$ GDP	n/a	2018	App Annie

Outdated data

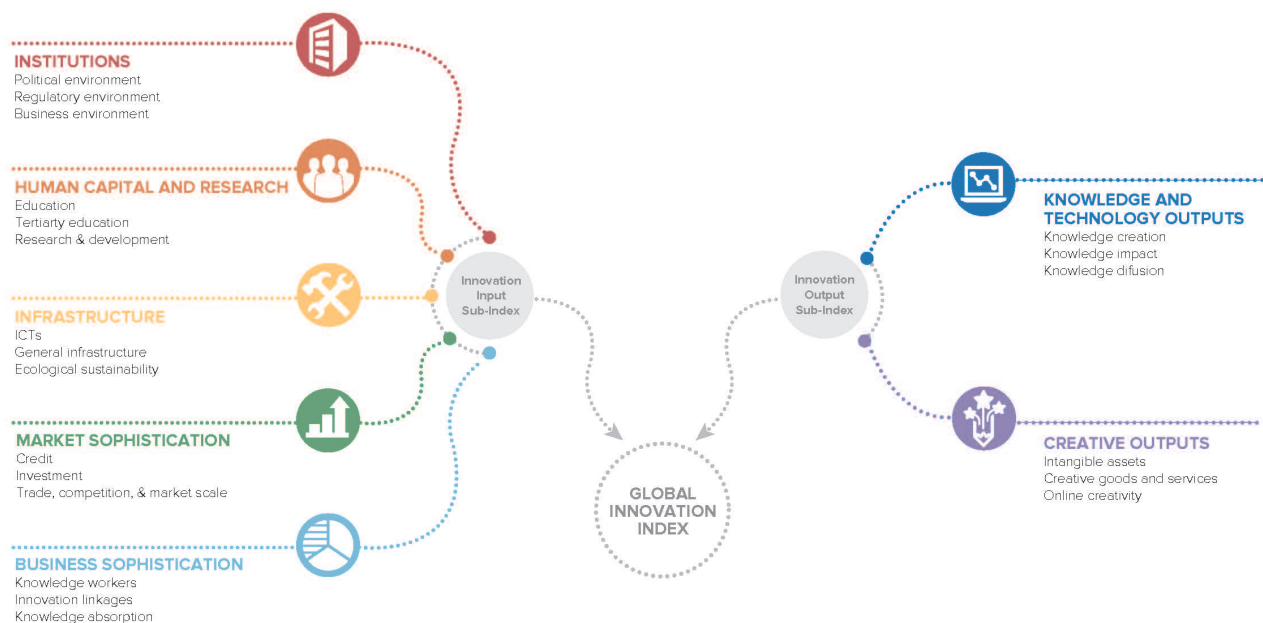| Code	Indicator name	Country year	Model year	Source
2.3.1	Researchers, FTE/mn pop.	2015	2017	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
2.3.2	Gross expenditure on R&D, % GDP	2015	2017	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.1.1	Knowledge-intensive employment, %	2015	2017	Source: International Labour Organization
5.1.3	GERD performed by business, % GDP	2010	2017	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.1.4	GERD financed by business, %	2015	2016	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.1.5	Females employed w/advanced degrees, %	2015	2017	International Labour Organization
5.2.3	GERD financed by abroad, %	2015	2016	UNESCO Institute for Statistics
5.3.5	Research talent, % in business enterprise	2010	2017	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
6.2.5	High- & medium-high-tech manufactures, %	2012	2016	United Nations Industrial Development Organization
7.2.4	Printing & other media, % manufacturing	2012	2016	United Nations Industrial Development Organization
7.3.3	Wikipedia edits/mn pop. 15–69	2014	2017	Wikimedia Foundation

ABOUT THE GLOBAL INNOVATION INDEX

The Global Innovation Index (GII) is co-published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations. In 2019, the GII presents its 12th edition devoted to the theme **Creating Healthy Lives—The Future of Medical Innovation**.

Recognizing that innovation is a key driver of economic development, the GII aims to provide a rich innovation ranking and 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 countries that incorporate the GII into their innovation agendas.

Framework of the Global Innovation Index 2019

INSTITUTIONS
Political environment
Regulatory environment
Business environment

HUMAN CAPITAL AND RESEARCH
Education
Tertiarty education
Research & development

INFRASTRUCTURE
ICTs
General infrastructure
Ecological sustainability

MARKET SOPHISTICATION
Credit
Investment
Trade, competition, & market scale

BUSINESS SOPHISTICATION
Knowledge workers
Innovation linkages
Knowledge absorption

Innovation Input Sub-Index

Innovation Output Sub-Index

GLOBAL INNOVATION INDEX

KNOWLEDGE AND TECHNOLOGY OUTPUTS
Knowledge creation
Knowledge impact
Knowledge difusion

CREATIVE OUTPUTS
Intangible assets
Creative goods and services
Online creativity

The Index is a ranking of the innovation capabilities and results of world economies. It measures innovation based on criteria that includes 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 containing three sub-pillars.