Global Innovation Index 2022

UNITED REPUBLIC OF TANZANIA

103rd

Tanzania ranks 103rd 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 Tanzania 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 Tanzania in the GII 2022 is between ranks 99 and 119.

Rankings for Tanzania (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	88	112	67
2021	90	120	65
2022	103	100	99

- Tanzania performs better in innovation outputs than innovation inputs in 2022.
- This year Tanzania ranks 100th in innovation inputs, higher than both 2021 and 2020.
- As for innovation outputs, Tanzania ranks 99th. This position is lower than both 2021 and 2020.

21st

Tanzania ranks 21st among the 36 lower-middle-income group economies.

8th

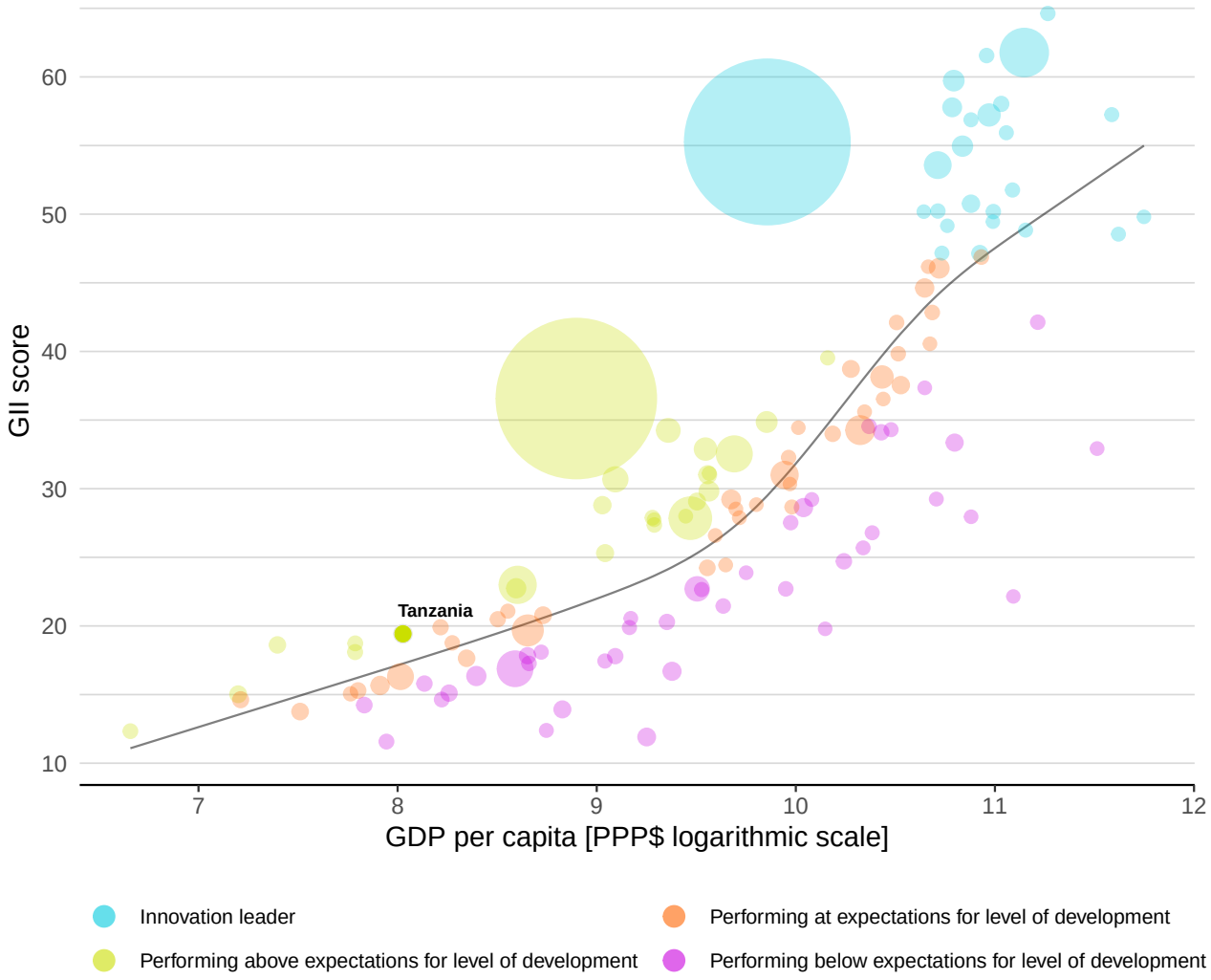
Tanzania ranks 8th among the 27 economies in Sub-Saharan Africa.

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

The positive relationship between innovation and development

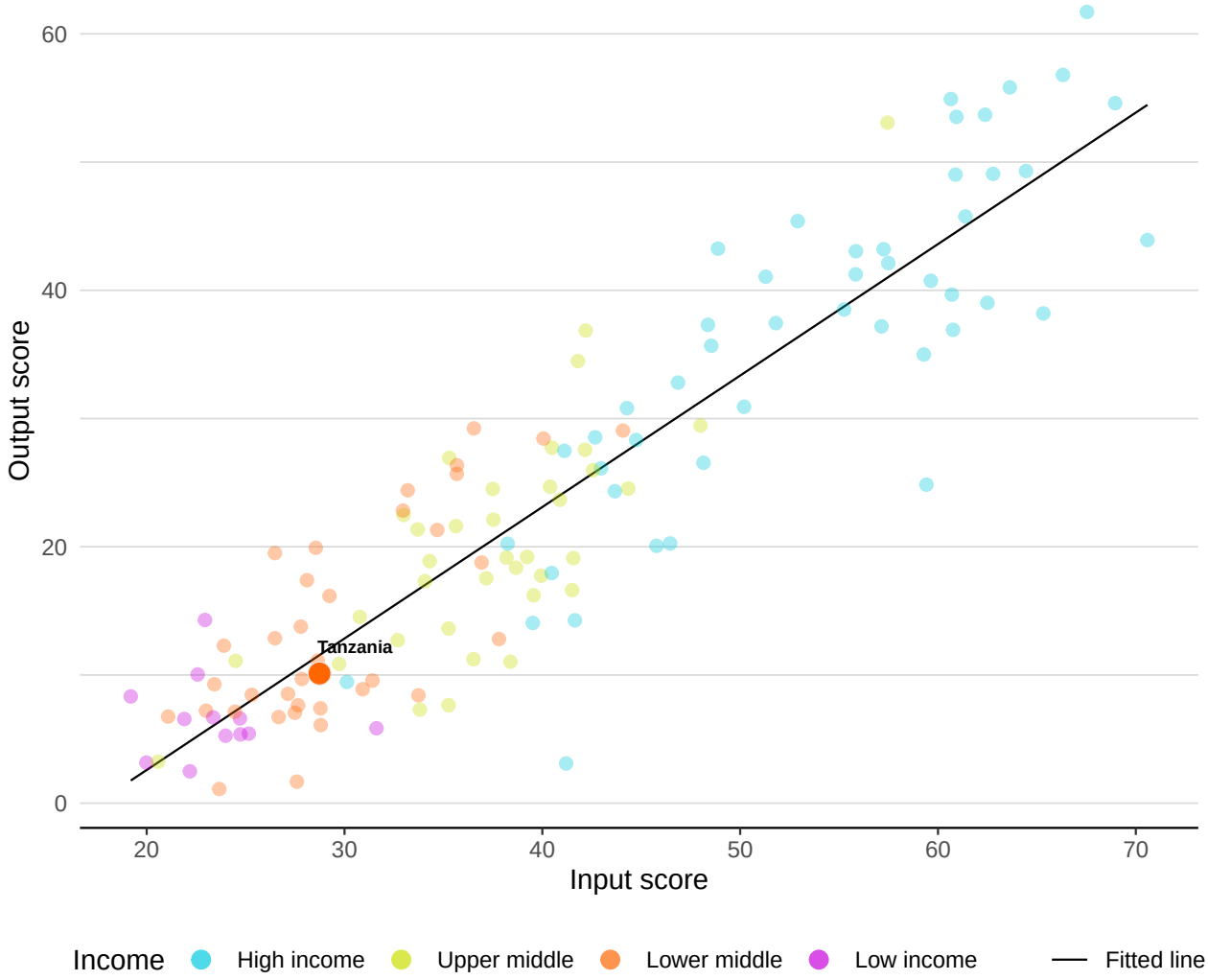


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

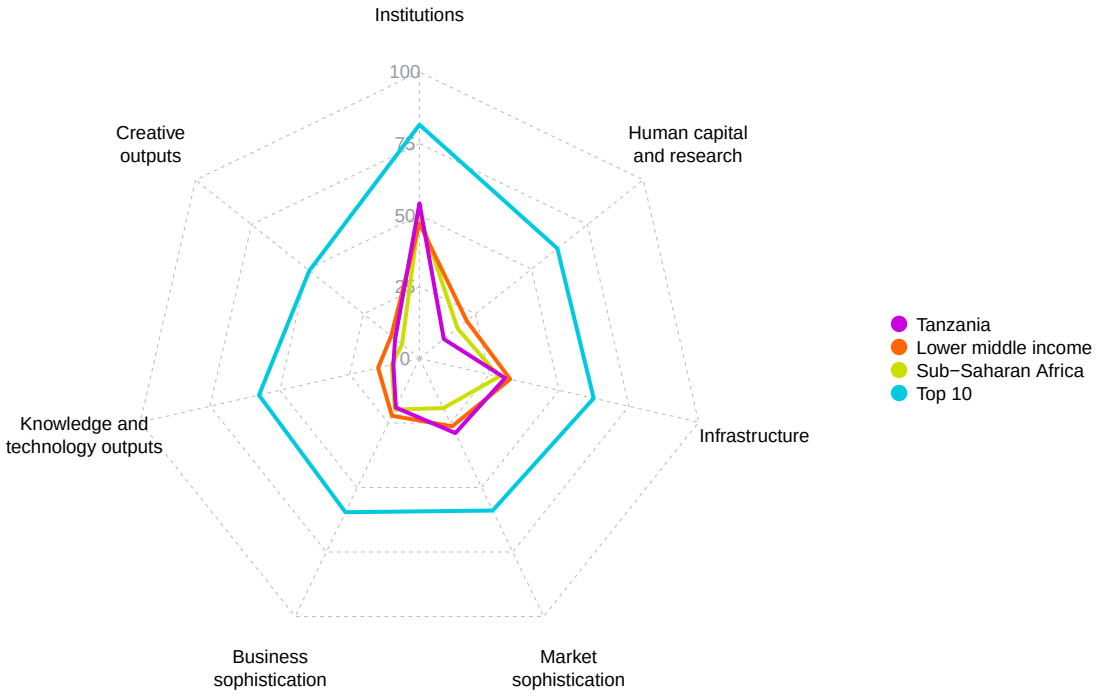
Tanzania produces less innovation outputs relative to its level of innovation investments.

Innovation input to output performance



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

The seven GII pillar scores for Tanzania



Lower-middle-income group economies

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

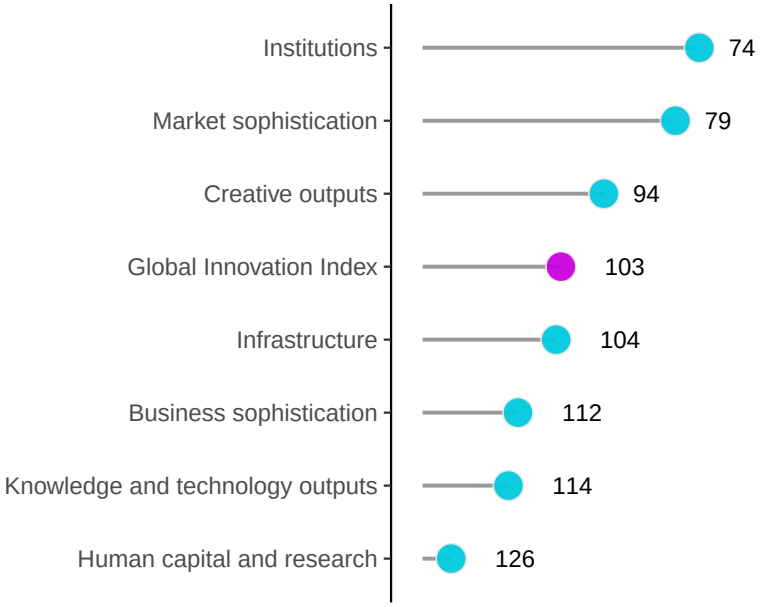
Sub-Saharan Africa

Tanzania performs above the regional average in four pillars, namely: Institutions; Infrastructure; Market sophistication; and, Creative outputs.

OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

Tanzania performs best in Institutions and its weakest performance is in Human capital and research.

The seven GII pillar ranks for Tanzania



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

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

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

INNOVATION STRENGTHS AND WEAKNESSES

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

Strengths and weaknesses for Tanzania

Strengths			Weaknesses		
Code	**Indicator name**	**Rank**	**Code**	**Indicator name**	**Rank**
1.2.3	Cost of redundancy dismissal	24	2.2.2	Graduates in science and engineering, %	109
1.3.1	Policies for doing business	51	2.3.1	Researchers, FTE/mn pop.	106
2.3.2	Gross expenditure on R&D, % GDP	63	2.3.3	Global corporate R&D investors, top 3, mn USD	38
3.2.3	Gross capital formation, % GDP	8	2.3.4	QS university ranking, top 3	72
4.1.3	Loans from microfinance institutions, % GDP	1	5.1.1	Knowledge-intensive employment, %	125
4.3.3	Domestic market scale, bn PPP$	71	5.1.5	Females employed w/advanced degrees, %	123
5.2.1	University-industry R&D collaboration	43	5.2.5	Patent families/bn PPP$ GDP	101
5.2.2	State of cluster development and depth	44	6.1.1	Patents by origin/bn PPP$ GDP	130
6.2.1	Labor productivity growth, %	9	6.1.2	PCT patents by origin/bn PPP$ GDP	101
7.2.4	Printing and other media, % manufacturing	9	6.2.3	Software spending, % GDP	123

GII 2022 rank

United Republic of Tanzania

103

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
99	100	Lower middle	SSA	61.5	182.9	3,062

		Score/ Value	Rank
Institutions		**54.2**	**74**
1.1	**Political environment**	44.7	115
1.1.1	Political and operational stability*	56.4	108
1.1.2	Government effectiveness*	33.1	117
1.2	**Regulatory environment**	63.4	68 ● ◆
1.2.1	Regulatory quality*	28.5	108
1.2.2	Rule of law*	30.4	100
1.2.3	Cost of redundancy dismissal	9.3	24 ● ◆
1.3	**Business environment**	54.4	[50]
1.3.1	Policies for doing business†	54.4	51 ●
1.3.2	Entrepreneurship policies and culture*	n/a	n/a
Human capital and research		**10.9**	**126** ◇
2.1	**Education**	29.8	123
2.1.1	Expenditure on education, % GDP	3.3	102
2.1.2	Government funding/pupil, secondary, % GDP/cap	14.9	83
2.1.3	School life expectancy, years	9.2	108 ◇
2.1.4	PISA scales in reading, maths and science	n/a	n/a
2.1.5	Pupil-teacher ratio, secondary	23.3	101
2.2	**Tertiary education**	1.3	127 ○ ◇
2.2.1	Tertiary enrolment, % gross	7.8	118
2.2.2	Graduates in science and engineering, %	9.5	109 ○ ◇
2.2.3	Tertiary inbound mobility, %	n/a	n/a
2.3	**Research and development (R&D)**	1.6	90
2.3.1	Researchers, FTE/mn pop.	19.2	106 ○
2.3.2	Gross expenditure on R&D, % GDP	0.5	63 ●
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		**30.7**	**104**
3.1	**Information and communication technologies (ICTs)**	46.8	113
3.1.1	ICT access*	49.2	123 ◇
3.1.2	ICT use*	26.9	117 ◇
3.1.3	Government's online service*	55.3	94
3.1.4	E-participation*	56.0	92
3.2	**General infrastructure**	28.4	69 ●
3.2.1	Electricity output, GWh/mn pop.	135.7	121
3.2.2	Logistics performance*	n/a	n/a
3.2.3	Gross capital formation, % GDP	36.5	8 ● ◆
3.3	**Ecological sustainability**	16.9	114
3.3.1	GDP/unit of energy use	6.7	105
3.3.2	Environmental performance*	34.2	94
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.2	110
Market sophistication		**28.9**	**79**
4.1	**Credit**	51.5	15 ● ◆
4.1.1	Finance for startups and scaleups*	n/a	n/a
4.1.2	Domestic credit to private sector, % GDP	13.2	120
4.1.3	Loans from microfinance institutions, % GDP	14.5	1 ● ◆
4.2	**Investment**	2.5	100
4.2.1	Market capitalization, % GDP	10.4	73
4.2.2	Venture capital investors, deals/bn PPP$ GDP	0.0	91 ◇
4.2.3	Venture capital recipients, deals/bn PPP$ GDP	0.0	70
4.2.4	Venture capital received, value, % GDP	0.0	91
4.3	**Trade, diversification, and market scale**	32.7	112
4.3.1	Applied tariff rate, weighted avg., %	8.9	111
4.3.2	Domestic industry diversification	52.1	100
4.3.3	Domestic market scale, bn PPP$	182.9	71 ●

		Score/ Value	Rank
Business sophistication		**19.0**	**112**
5.1	**Knowledge workers**	12.2	[116]
5.1.1	Knowledge-intensive employment, %	3.4	125 ○ ◇
5.1.2	Firms offering formal training, %	30.7	54
5.1.3	GERD performed by business, % GDP	n/a	n/a
5.1.4	GERD financed by business, %	n/a	n/a
5.1.5	Females employed w/advanced degrees, %	0.4	123 ○
5.2	**Innovation linkages**	26.5	49 ● ◆
5.2.1	University-industry R&D collaboration†	50.6	43 ● ◆
5.2.2	State of cluster development and depth†	52.0	44 ●
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	100
5.2.5	Patent families/bn PPP$ GDP	0.0	101 ○ ◇
5.3	**Knowledge absorption**	18.5	121
5.3.1	Intellectual property payments, % total trade	0.1	108
5.3.2	High-tech imports, % total trade	7.4	84
5.3.3	ICT services imports, % total trade	0.3	124
5.3.4	FDI net inflows, % GDP	1.6	83
5.3.5	Research talent, % in businesses	n/a	n/a
Knowledge and technology outputs		**9.4**	**114**
6.1	**Knowledge creation**	4.6	109
6.1.1	Patents by origin/bn PPP$ GDP	0.0	130 ○
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	77
6.1.4	Scientific and technical articles/bn PPP$ GDP	9.8	89
6.1.5	Citable documents H-index	9.4	78
6.2	**Knowledge impact**	17.1	99
6.2.1	Labor productivity growth, %	3.5	9 ●
6.2.2	New businesses/th pop. 15–64	0.2	113
6.2.3	Software spending, % GDP	0.0	123 ○ ◇
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	0.5	118
6.2.5	High-tech manufacturing, %	6.9	95
6.3	**Knowledge diffusion**	6.4	116
6.3.1	Intellectual property receipts, % total trade	0.0	110
6.3.2	Production and export complexity	18.1	109
6.3.3	High-tech exports, % total trade	0.2	102
6.3.4	ICT services exports, % total trade	0.3	117
Creative outputs		**10.9**	**[94]**
7.1	**Intangible assets**	6.5	[113]
7.1.1	Intangible asset intensity, top 15, %	n/a	n/a
7.1.2	Trademarks by origin/bn PPP$ GDP	11.5	106
7.1.3	Global brand value, top 5,000, % GDP	n/a	n/a
7.1.4	Industrial designs by origin/bn PPP$ GDP	n/a	n/a
7.2	**Creative goods and services**	30.4	[27]
7.2.1	Cultural and creative services exports, % total trade	n/a	n/a
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	2.3	9 ● ◆
7.2.5	Creative goods exports, % total trade	0.1	107
7.3	**Online creativity**	0.1	124
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.1	120
7.3.2	Country-code TLDs/th pop. 15–69	0.2	113
7.3.3	GitHub commit pushes received/mn pop. 15–69	0.2	121
7.3.4	Mobile app creation/bn PPP$ GDP	0.0	108

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 Tanzania.

Missing data for Tanzania

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
2.2.3	Tertiary inbound mobility, %	n/a	2019	UNESCO Institute for Statistics
3.2.2	Logistics performance	n/a	2018	Logistics Performance Index, World Bank
4.1.1	Finance for startups and scaleups	n/a	2021	Global Entrepreneurship Monitor
5.1.3	GERD performed by business, % GDP	n/a	2020	UNESCO Institute for Statistics
5.1.4	GERD financed by business, %	n/a	2019	UNESCO Institute for Statistics
5.2.3	GERD financed by abroad, % GDP	n/a	2019	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
7.1.3	Global brand value, top 5,000, % GDP	n/a	2021	Brand Finance
7.1.4	Industrial designs by origin/bn PPP$ GDP	n/a	2020	World Intellectual Property Organization
7.2.1	Cultural and creative services exports, % total trade	n/a	2020	World Trade Organization and United Nations Conference on Trade and Development
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 Tanzania

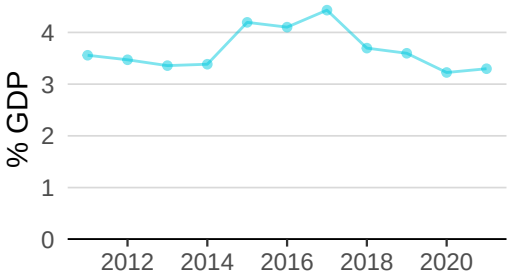
Code	Indicator name	Economy year	Model year	Source
2.1.2	Government funding/pupil, secondary, % GDP/cap	2014	2018	UNESCO Institute for Statistics
2.2.2	Graduates in science and engineering, %	2019	2020	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2013	2020	UNESCO Institute for Statistics
2.3.2	Gross expenditure on R&D, % GDP	2013	2020	UNESCO Institute for Statistics
3.2.1	Electricity output, GWh/mn pop.	2019	2020	International Energy Agency
4.1.3	Loans from microfinance institutions, % GDP	2014	2020	International Monetary Fund, Financial Access Survey (FAS)
4.2.3	Venture capital recipients, deals/bn PPP$ GDP	2020	2021	Refinitiv

Code	Indicator name	Economy year	Model year	Source
4.2.4	Venture capital received, value, % GDP	2020	2021	Refinitiv
5.1.1	Knowledge-intensive employment, %	2014	2021	International Labour Organization
5.1.2	Firms offering formal training, %	2013	2019	World Bank Enterprise Surveys
5.1.5	Females employed w/advanced degrees, %	2014	2021	International Labour Organization
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
6.1.1	Patents by origin/bn PPP$ GDP	2015	2020	World Intellectual Property Organization
6.2.2	New businesses/th pop. 15–64	2018	2020	World Bank, Enterpreneurship Database
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

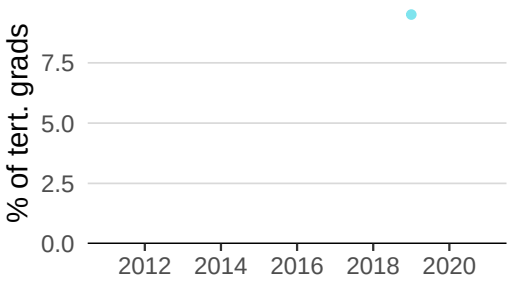
TANZANIA'S INNOVATION SYSTEM

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

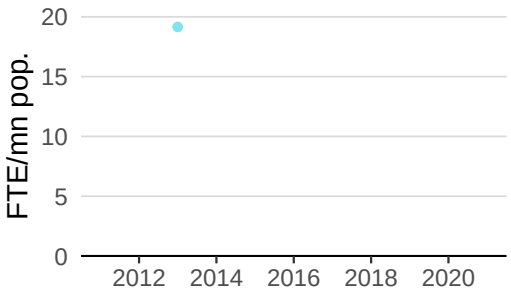
Innovation inputs



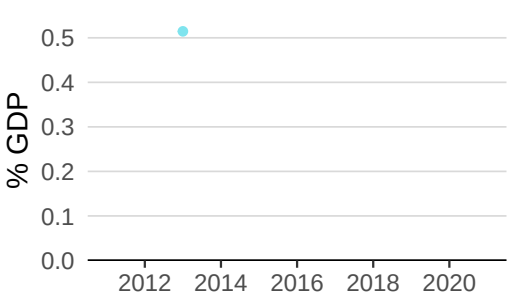
2.1.1 Expenditure on education was equal to 3.3% GDP in 2021–up by 2 percentage points from the year prior–and equivalent to an indicator rank of 102.



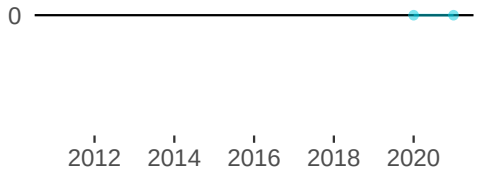
2.2.2 Graduates in science and engineering was equal to 9.5% of tert. grads in 2019 and equivalent to an indicator rank of 109.



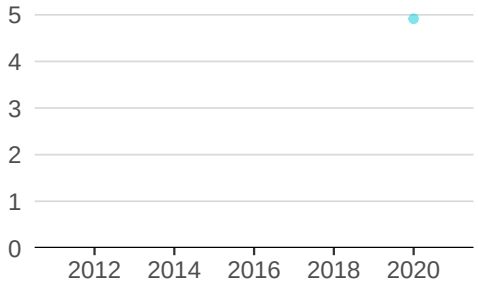
2.3.1 Researchers was equal to 19.2 FTE/mn pop. in 2013 and equivalent to an indicator rank of 106.



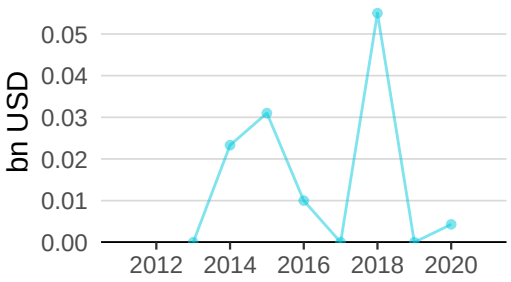
2.3.2 Gross expenditure on R&D was equal to 0.5% GDP in 2013 and equivalent to an indicator rank of 63.



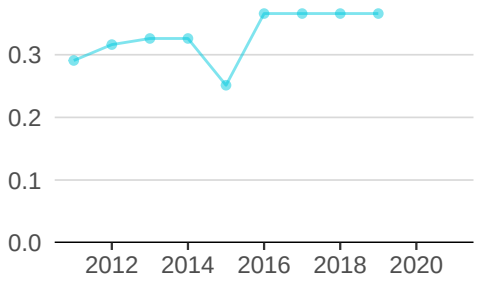
2.3.4 QS university ranking was equal to 0.0 in 2021–effectively unchanged from the year prior–and equivalent to an indicator rank of 72.



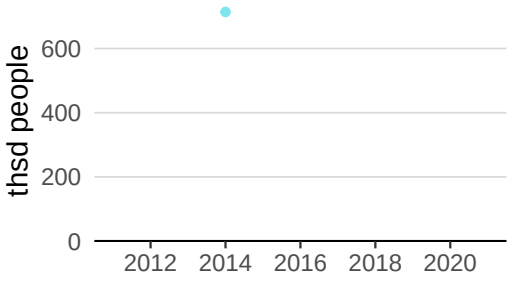
3.1.1 ICT access was equal to 4.9 in 2020 and equivalent to an indicator rank of 123.



4.2.4 Venture capital received was equal to 0.0 bn USD in 2020–up by Inf percentage points from the year prior–and equivalent to an indicator rank of 91.

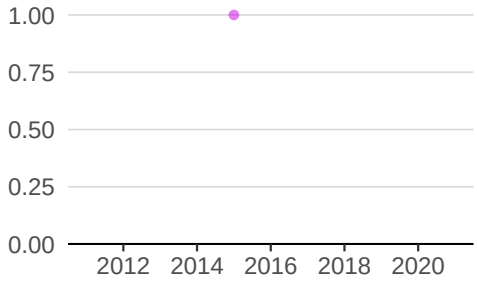


4.3.2 Domestic industry diversification was equal to 0.4 in 2019–effectively unchanged from the year prior–and equivalent to an indicator rank of 100.

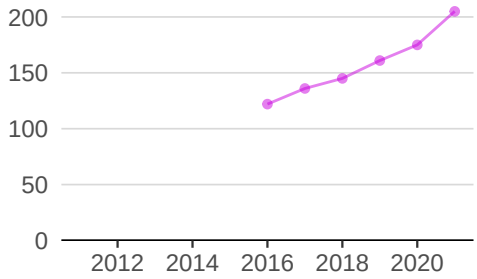


5.1.1 Knowledge-intensive employment was equal to 713.9 thsd people in 2014 and equivalent to an indicator rank of 125.

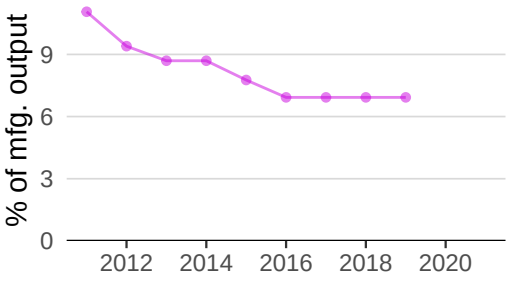
Innovation outputs



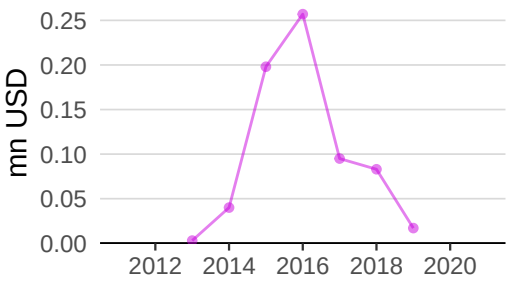
6.1.1 Patents by origin was equal to 1.0 in 2015 and equivalent to an indicator rank of 130.



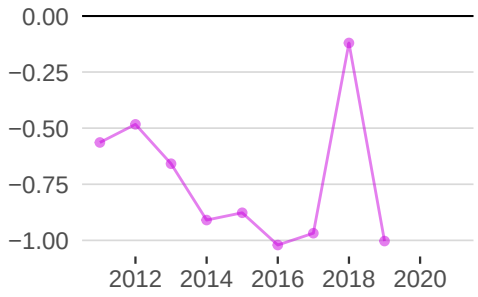
6.1.5 Citable documents H-index was equal to 205.0 in 2021–up by 17 percentage points from the year prior–and equivalent to an indicator rank of 78.



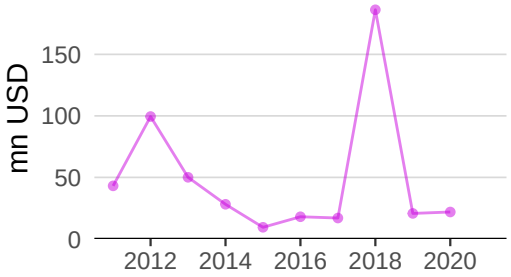
6.2.5 High-tech manufacturing was equal to 6.9% of mfg. output in 2019–effectively unchanged from the year prior–and equivalent to an indicator rank of 95.



6.3.1 Intellectual property receipts was equal to 0.0 mn USD in 2019–down by 80 percentage points from the year prior–and equivalent to an indicator rank of 110.



6.3.2 Production and export complexity was equal to -1.0 in 2019–down by 732 percentage points from the year prior–and equivalent to an indicator rank of 109.



6.3.3 High-tech exports was equal to 21.9 mn USD in 2020–up by 6 percentage points from the year prior–and equivalent to an indicator rank of 102.

TANZANIA'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

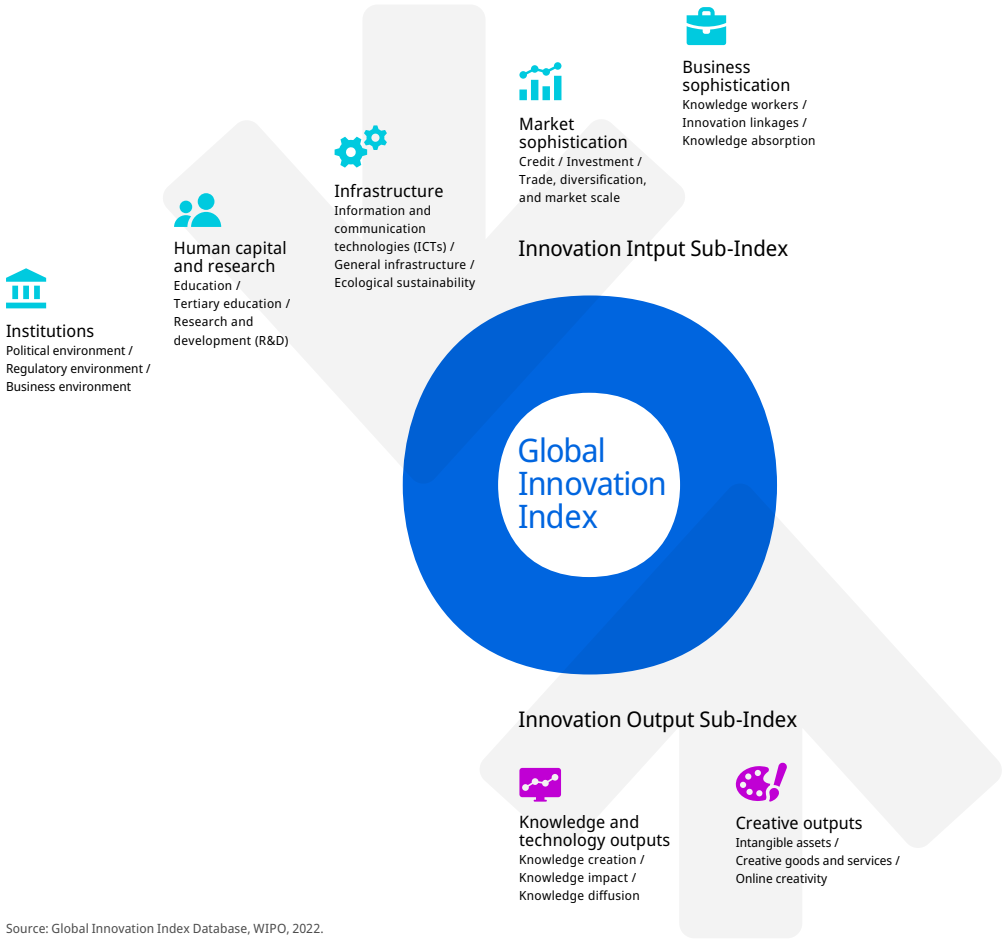
No observations

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.