



Global Innovation Index 2021



YEMEN

131st Yemen ranks 131st among the 132 economies featured in the GII 2021.

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 Yemen 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 Yemen in the GII 2021 is between ranks 128 and 132.

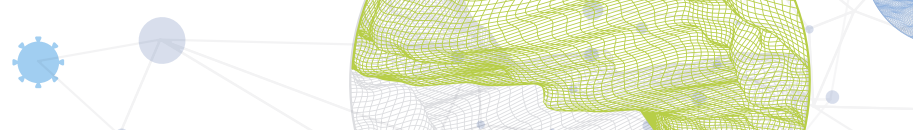
Rankings for Yemen (2019–2021)

| | GII | Innovation inputs | Innovation outputs |
|------|-----|-------------------|--------------------|
| 2021 | 131 | 132 | 125 |
| 2020 | 131 | 131 | 130 |
| 2019 | 129 | 129 | 129 |

- Yemen performs better in innovation outputs than innovation inputs in 2021.
- This year Yemen ranks 132nd in innovation inputs, lower than both 2020 and 2019.
- As for innovation outputs, Yemen ranks 125th. This position is higher than both 2020 and 2019.

13th Yemen ranks 13th among the 13 low-income group economies.

19th Yemen ranks 19th among the 19 economies in Northern Africa and Western Asia.

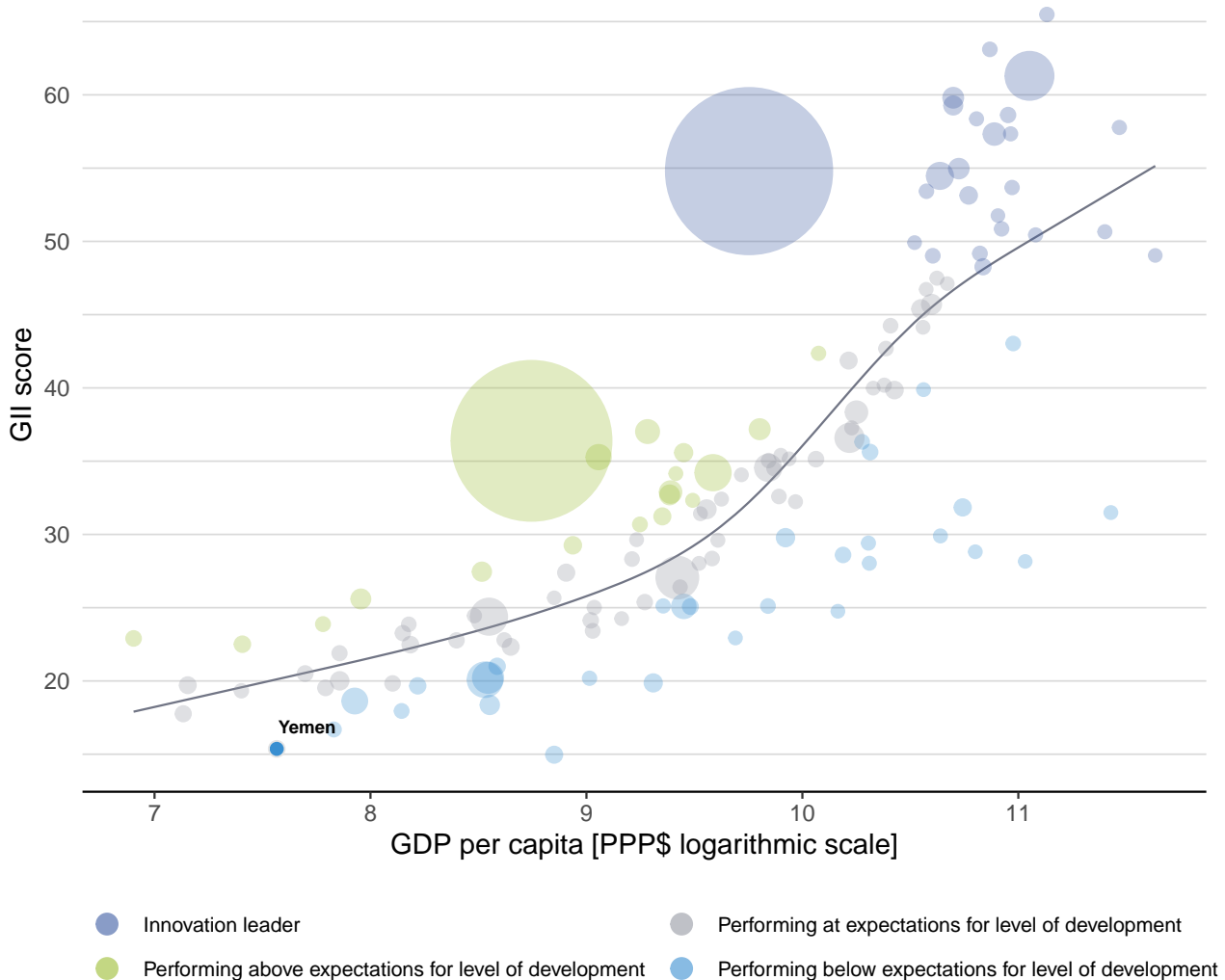


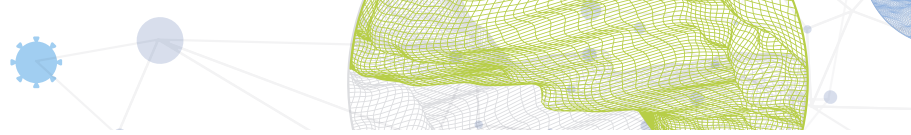
EXPECTED VS. OBSERVED INNOVATION PERFORMANCE

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

The positive relationship between innovation and development



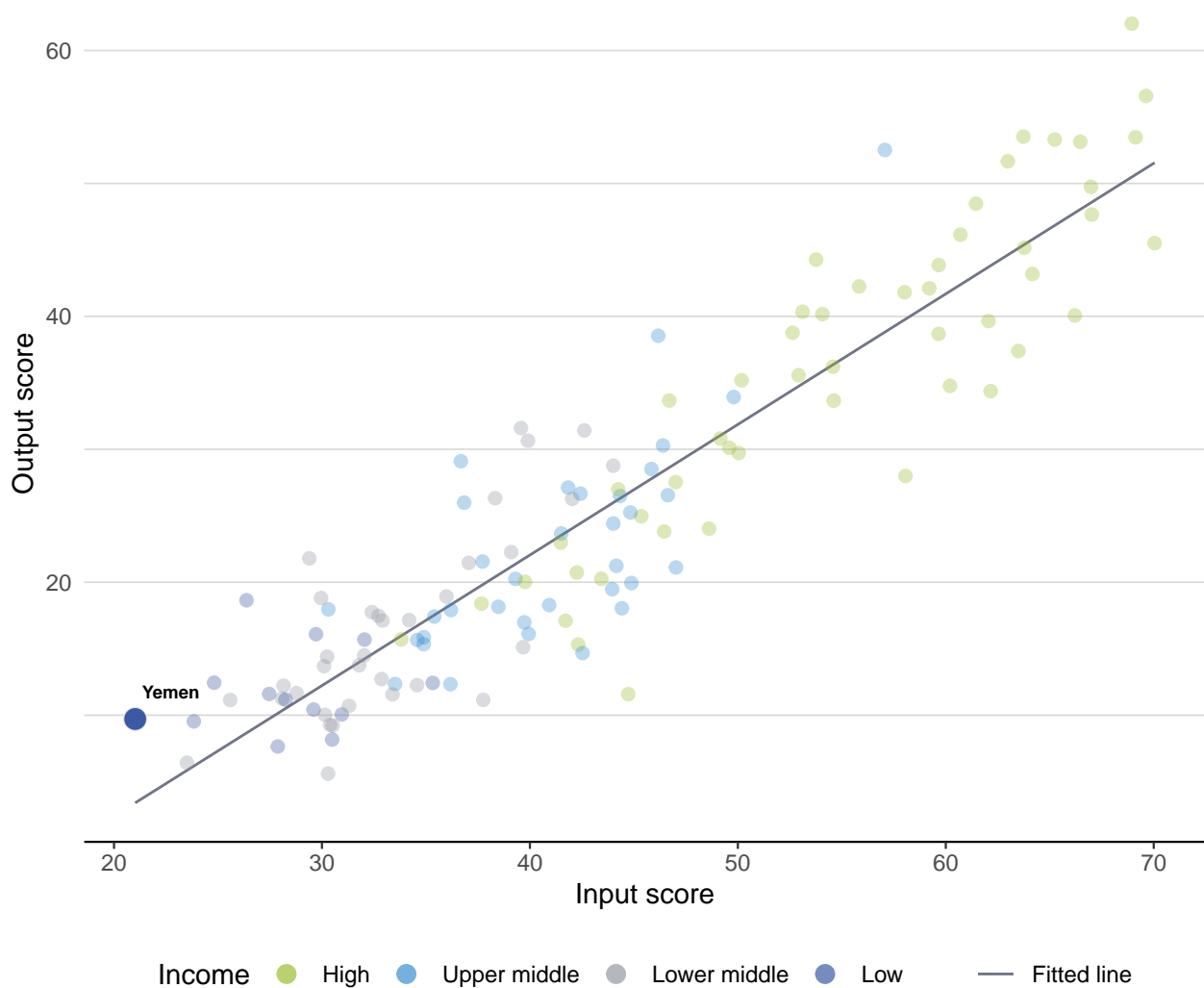


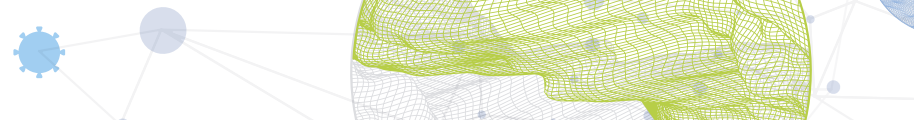
EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

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

Innovation input to output performance





BENCHMARKING AGAINST OTHER LOW-INCOME GROUP ECONOMIES AND NORTHERN AFRICA AND WESTERN ASIA

The seven GII pillar scores for Yemen



Low-income group economies

Yemen performs above the low-income group average in Business sophistication.

Northern Africa and Western Asia

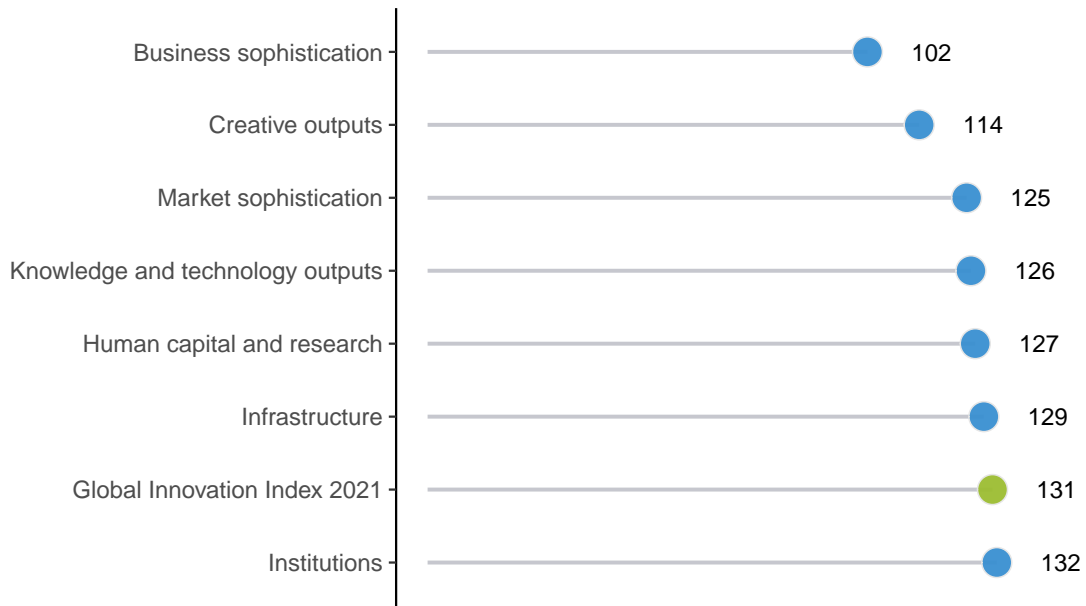
Yemen performs below the regional average in all GII pillars.



OVERVIEW OF RANKINGS IN THE SEVEN GII 2021 AREAS

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

The seven GII pillar ranks for Yemen



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










INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the strengths and weaknesses of Yemen in the GII 2021.

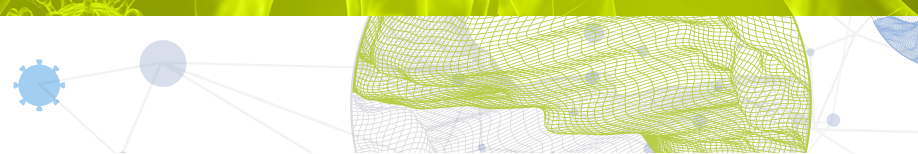
Strengths and weaknesses for Yemen

| Strengths | | | Weaknesses | | |
|-----------|------------------------------------------------|------|------------|------------------------------------------------|------|
| Code | Indicator name | Rank | Code | Indicator name | Rank |
| 2.2.3 | Tertiary inbound mobility, % | 56 | 1.1 | Political environment | 132 |
| 3.3 | Ecological sustainability | 53 | 1.1.1 | Political and operational stability | 132 |
| 3.3.1 | GDP/unit of energy use | 7 | 1.1.2 | Government effectiveness | 132 |
| 4.3 | Trade, diversification, and market scale | 92 | 1.2.1 | Regulatory quality | 132 |
| 4.3.1 | Applied tariff rate, weighted avg., % | 87 | 1.2.2 | Rule of law | 132 |
| 4.3.3 | Domestic market scale, bn PPP\$ | 94 | 2.3.3 | Global corporate R&D investors, top 3, mn US\$ | 41 |
| 5.3 | Knowledge absorption | 50 | 2.3.4 | QS university ranking, top 3 | 74 |
| 5.3.1 | Intellectual property payments, % total trade | 5 | 3.2 | General infrastructure | 132 |
| 6.1.1 | Patents by origin/bn PPP\$ GDP | 66 | 3.2.3 | Gross capital formation, % GDP | 126 |
| 6.1.4 | Scientific and technical articles/bn PPP\$ GDP | 81 | 4.1 | Credit | 132 |
| 6.3.4 | ICT services exports, % total trade | 84 | 4.1.1 | Ease of getting credit | 132 |
| 7.1 | Intangible assets | 91 | 4.1.2 | Domestic credit to private sector, % GDP | 130 |
| 7.1.1 | Trademarks by origin/bn PPP\$ GDP | 28 | 5.2.1 | University-industry R&D collaboration | 127 |
| 7.1.3 | Industrial designs by origin/bn PPP\$ GDP | 78 | 5.2.5 | Patent families/bn PPP\$ GDP | 100 |
| | | | 6.2.5 | High-tech manufacturing, % | 110 |
| | | | 7.1.2 | Global brand value, top 5,000, % GDP | 80 |
| | | | 7.1.4 | ICTs and organizational model creation | 125 |
| | | | 7.2.3 | Entertainment and media market/th pop. 15–69 | 63 |

| Output rank | Input rank | Income | Region | Population (mn) | GDP, PPP\$ (bn) | GDP per capita, PPP\$ | GII 2020 rank |
|-------------|------------|--------|--------|-----------------|-----------------|-----------------------|---------------|
| 125 | 132 | Low | NAWA | 29.8 | 62.7 | 1,931 | 131 |

| | Score/ Value | Rank | | Score/ Value | Rank |
|---------------------------------------------------------------------------------------------------------------------|--------------|-------|---------------------------------------------------------------------------------------------------------------------------|--------------|-------|
|  Institutions | 27.6 | 132 |  Business sophistication | 18.6 | 102 |
| 1.1 Political environment | 0.0 | 132 | 5.1 Knowledge workers | 11.4 | [123] |
| 1.1.1 Political and operational stability* | 0.0 | 132 | 5.1.1 Knowledge-intensive employment, % | 12.4 | 102 |
| 1.1.2 Government effectiveness* | 0.0 | 132 | 5.1.2 Firms offering formal training, % | 14.3 | 91 |
| 1.2 Regulatory environment | 30.8 | 127 | 5.1.3 GERD performed by business, % GDP | n/a | n/a |
| 1.2.1 Regulatory quality* | 0.0 | 132 | 5.1.4 GERD financed by business, % | n/a | n/a |
| 1.2.2 Rule of law* | 0.0 | 132 | 5.1.5 Females employed w/advanced degrees, % | 1.1 | 113 |
| 1.2.3 Cost of redundancy dismissal | 27.4 | 110 | 5.2 Innovation linkages | 12.1 | 124 |
| 1.3 Business environment | 51.9 | 124 | 5.2.1 University-industry R&D collaboration† | 17.0 | 127 |
| 1.3.1 Ease of starting a business* | 76.8 | 116 | 5.2.2 State of cluster development and depth† | 31.0 | 122 |
| 1.3.2 Ease of resolving insolvency* | 26.9 | 125 | 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 | 103 |
| | | | 5.2.5 Patent families/bn PPP\$ GDP | 0.0 | 100 |
|  Human capital and research | 10.1 | [127] | 5.3 Knowledge absorption | 32.5 | 50 |
| 2.1 Education | 22.0 | [126] | 5.3.1 Intellectual property payments, % total trade | 3.3 | 5 |
| 2.1.1 Expenditure on education, % GDP | n/a | n/a | 5.3.2 High-tech imports, % total trade | 2.4 | 127 |
| 2.1.2 Government funding/pupil, secondary, % GDP/cap | 11.8 | 86 | 5.3.3 ICT services imports, % total trade | 0.3 | 122 |
| 2.1.3 School life expectancy, years | 9.1 | 112 | 5.3.4 FDI net inflows, % GDP | -1.3 | 124 |
| 2.1.4 PISA scales in reading, maths and science | n/a | n/a | 5.3.5 Research talent, % in businesses | n/a | n/a |
| 2.1.5 Pupil-teacher ratio, secondary | 26.8 | 110 |  Knowledge and technology outputs | 7.2 | 126 |
| 2.2 Tertiary education | 8.4 | 115 | 6.1 Knowledge creation | 6.6 | 97 |
| 2.2.1 Tertiary enrolment, % gross | 10.2 | 113 | 6.1.1 Patents by origin/bn PPP\$ GDP | 0.9 | 66 |
| 2.2.2 Graduates in science and engineering, % | n/a | n/a | 6.1.2 PCT patents by origin/bn PPP\$ GDP | n/a | n/a |
| 2.2.3 Tertiary inbound mobility, % | 4.3 | 56 | 6.1.3 Utility models by origin/bn PPP\$ GDP | 0.0 | 69 |
| 2.3 Research and development (R&D) | 0.0 | [123] | 6.1.4 Scientific and technical articles/bn PPP\$ GDP | 10.6 | 81 |
| 2.3.1 Researchers, FTE/mn pop. | n/a | n/a | 6.1.5 Citable documents H-index | 3.3 | 121 |
| 2.3.2 Gross expenditure on R&D, % GDP | n/a | n/a | 6.2 Knowledge impact | 10.1 | 123 |
| 2.3.3 Global corporate R&D investors, top 3, mn US\$ | 0.0 | 41 | 6.2.1 Labor productivity growth, % | -3.7 | 114 |
| 2.3.4 QS university ranking, top 3* | 0.0 | 74 | 6.2.2 New businesses/th pop. 15-64 | n/a | n/a |
| | | | 6.2.3 Software spending, % GDP | 0.1 | 99 |
|  Infrastructure | 19.8 | 129 | 6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP | 0.2 | 131 |
| 3.1 Information and communication technologies (ICTs) | 25.2 | 130 | 6.2.5 High-tech manufacturing, % | 1.2 | 110 |
| 3.1.1 ICT access* | 25.7 | 126 | 6.3 Knowledge diffusion | 5.1 | 120 |
| 3.1.2 ICT use* | 11.7 | 128 | 6.3.1 Intellectual property receipts, % total trade | 0.0 | 82 |
| 3.1.3 Government's online service* | 32.4 | 123 | 6.3.2 Production and export complexity | 13.6 | 116 |
| 3.1.4 E-participation* | 31.0 | 124 | 6.3.3 High-tech exports, % total trade | 0.1 | 124 |
| 3.2 General infrastructure | 2.6 | 132 | 6.3.4 ICT services exports, % total trade | 0.9 | 84 |
| 3.2.1 Electricity output, GWh/mn pop. | 126.6 | 120 |  Creative outputs | 12.2 | 114 |
| 3.2.2 Logistics performance* | 10.2 | 120 | 7.1 Intangible assets | 22.4 | 91 |
| 3.2.3 Gross capital formation, % GDP | 6.4 | 126 | 7.1.1 Trademarks by origin/bn PPP\$ GDP | 66.5 | 28 |
| 3.3 Ecological sustainability | 31.5 | 53 | 7.1.2 Global brand value, top 5,000, % GDP | 0.0 | 80 |
| 3.3.1 GDP/unit of energy use | 21.1 | 7 | 7.1.3 Industrial designs by origin/bn PPP\$ GDP | 0.7 | 78 |
| 3.3.2 Environmental performance* | n/a | n/a | 7.1.4 ICTs and organizational model creation† | 21.7 | 125 |
| 3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP | 0.1 | 123 | 7.2 Creative goods and services | 0.0 | [132] |
| | | | 7.2.1 Cultural and creative services exports, % total trade | n/a | n/a |
|  Market sophistication | 29.0 | 125 | 7.2.2 National feature films/mn pop. 15-69 | n/a | n/a |
| 4.1 Credit | 0.3 | 132 | 7.2.3 Entertainment and media market/th pop. 15-69 | 0.0 | 63 |
| 4.1.1 Ease of getting credit* | 0.0 | 132 | 7.2.4 Printing and other media, % manufacturing | n/a | n/a |
| 4.1.2 Domestic credit to private sector, % GDP | 5.6 | 130 | 7.2.5 Creative goods exports, % total trade | 0.0 | 128 |
| 4.1.3 Microfinance gross loans, % GDP | 0.1 | 61 | 7.3 Online creativity | 3.8 | 126 |
| 4.2 Investment | 26.0 | [80] | 7.3.1 Generic top-level domains (TLDs)/th pop. 15-69 | 0.4 | 114 |
| 4.2.1 Ease of protecting minority investors* | 26.0 | 126 | 7.3.2 Country-code TLDs/th pop. 15-69 | 0.0 | 130 |
| 4.2.2 Market capitalization, % GDP | n/a | n/a | 7.3.3 Wikipedia edits/mn pop. 15-69 | 19.1 | 125 |
| 4.2.3 Venture capital investors, deals/bn PPP\$ GDP | n/a | n/a | 7.3.4 Mobile app creation/bn PPP\$ GDP | 0.2 | 84 |
| 4.2.4 Venture capital recipients, deals/bn PPP\$ GDP | n/a | n/a | | | |
| 4.3 Trade, diversification, and market scale | 60.6 | 92 | | | |
| 4.3.1 Applied tariff rate, weighted avg., % | 5.0 | 87 | | | |
| 4.3.2 Domestic industry diversification | 75.1 | 91 | | | |
| 4.3.3 Domestic market scale, bn PPP\$ | 62.7 | 94 | | | |

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 IV 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 either missing or outdated for Yemen.

Missing data for Yemen

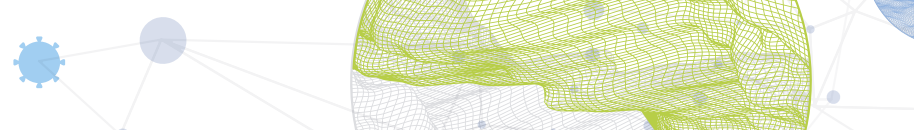
| Code | Indicator name | Economy year | Model year | Source |
|-------|------------------------------------------------|--------------|------------|------------------------------------------------------------------------------------------|
| 2.1.1 | Expenditure on education, % GDP | n/a | 2017 | UNESCO Institute for Statistics |
| 2.1.4 | PISA scales in reading, maths and science | n/a | 2018 | OECD Programme for International Student Assessment (PISA) |
| 2.2.2 | Graduates in science and engineering, % | n/a | 2018 | UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators |
| 2.3.1 | Researchers, FTE/mn pop. | n/a | 2019 | UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators |
| 2.3.2 | Gross expenditure on R&D, % GDP | n/a | 2019 | UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators |
| 3.3.2 | Environmental performance | n/a | 2020 | Yale University and Columbia University |
| 4.2.2 | Market capitalization, % GDP | n/a | 2019 | World Federation of Exchanges |
| 4.2.3 | Venture capital investors, deals/bn PPP\$ GDP | n/a | 2020 | Refinitiv Eikon |
| 4.2.4 | Venture capital recipients, deals/bn PPP\$ GDP | n/a | 2020 | Refinitiv Eikon |
| 5.1.3 | GERD performed by business, % GDP | n/a | 2019 | UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators |
| 5.1.4 | GERD financed by business, % | n/a | 2018 | UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators |
| 5.2.3 | GERD financed by abroad, % GDP | n/a | 2018 | UNESCO Institute for Statistics |
| 5.3.5 | Research talent, % in businesses | n/a | 2019 | UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators |
| 6.1.2 | PCT patents by origin/bn PPP\$ GDP | n/a | 2020 | World Intellectual Property Organization |
| 6.2.2 | New businesses/th pop. 15–64 | n/a | 2018 | World Bank |



| Code | Indicator name | Economy year | Model year | Source |
|-------|-------------------------------------------------------|--------------|------------|----------------------------------------------------|
| 7.2.1 | Cultural and creative services exports, % total trade | n/a | 2019 | World Trade Organization |
| 7.2.2 | National feature films/mn pop. 15–69 | n/a | 2017 | UNESCO Institute for Statistics |
| 7.2.4 | Printing and other media, % manufacturing | n/a | 2018 | United Nations Industrial Development Organization |

Outdated data for Yemen

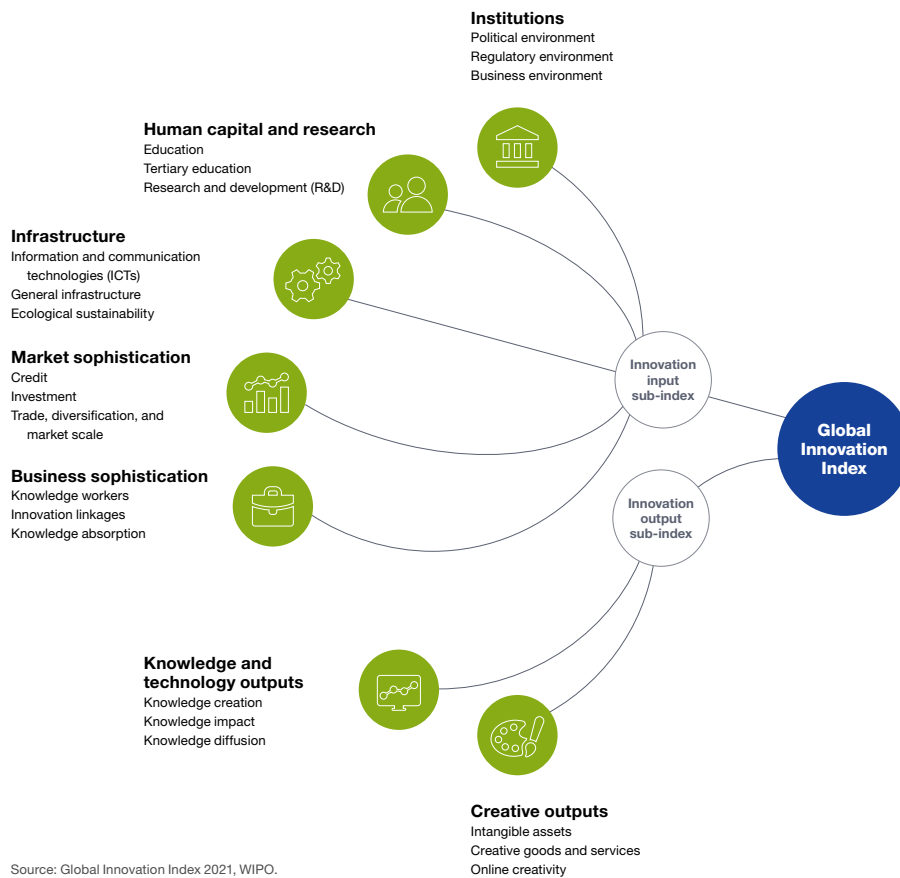
| Code | Indicator name | Economy year | Model year | Source |
|-------|------------------------------------------------|--------------|------------|----------------------------------------------------|
| 2.1.2 | Government funding/pupil, secondary, % GDP/cap | 2011 | 2017 | UNESCO Institute for Statistics |
| 2.1.3 | School life expectancy, years | 2011 | 2018 | UNESCO Institute for Statistics |
| 2.1.5 | Pupil-teacher ratio, secondary | 2016 | 2019 | UNESCO Institute for Statistics |
| 2.2.1 | Tertiary enrolment, % gross | 2011 | 2018 | UNESCO Institute for Statistics |
| 2.2.3 | Tertiary inbound mobility, % | 2011 | 2018 | UNESCO Institute for Statistics |
| 4.1.2 | Domestic credit to private sector, % GDP | 2013 | 2019 | International Monetary Fund |
| 4.3.1 | Applied tariff rate, weighted avg., % | 2017 | 2019 | World Bank |
| 4.3.2 | Domestic industry diversification | 2014 | 2018 | United Nations Industrial Development Organization |
| 5.1.1 | Knowledge-intensive employment, % | 2014 | 2019 | International Labour Organization |
| 5.1.2 | Firms offering formal training, % | 2013 | 2019 | World Bank |
| 5.1.5 | Females employed w/advanced degrees, % | 2014 | 2019 | International Labour Organization |
| 6.1.3 | Utility models by origin/bn PPP\$ GDP | 2016 | 2019 | World Intellectual Property Organization |
| 6.2.5 | High-tech manufacturing, % | 2014 | 2018 | United Nations Industrial Development Organization |
| 6.3.3 | High-tech exports, % total trade | 2015 | 2019 | United Nations, COMTRADE |
| 7.2.5 | Creative goods exports, % total trade | 2015 | 2019 | United Nations, COMTRADE |



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.