SDG20

Measuring sustainable
development in the G20 countries

This document was produced in collaboration with:

Contents

Introduction

The G20 has, since its inception, gradually acquired increasing relevance and authoritativeness in the panorama of the international summits held on a regular basis, More inclusive than the European Council and G7 and less dispersive than the United Nations General Assembly, the G20 seems to have found a middle way that enables the forum to be incisive and timely, despite the rites of global diplomacy. This aspect is of particular importance, given the growing role it has assumed over the years in resolving major crises with global implications, from the Great Recession to the current pandemic.

The summit's Italian presidency chose to focus attention on "People, Planet, Prosperity", in keeping with the 2030 Agenda and with the aim of guaranteeing a sustainable, inclusive recovery from the crisis caused by the pandemic and responding to the challenges of climate change and global inequality. This ambition has made it necessary to ensure that the summit will be a success, alongside the many ministerial meetings that have taken place beforehand, and this ambition will be reflected in both the commitments made by heads of state and in the following steps, first of all COP26 in Glasgow.

The Italian Alliance for Sustainable Development (ASviS), in collaboration with A2A and CIJBO, chose to contribute to this process by presenting the results of an assessment of the progress made by the 20 countries in delivering on the 2030 Agenda. The biggest challenge in conducting such a task, which is the first of its kind and still of an experimental nature, is its complexity. In this regard, the composite indicators used in this document are not intended to simplify the problem but represent a tool that aims to offer an initial, rapid overview of the countries' performances in relation to each Goal. The results of this research are useful in giving interested parties and the media a brief, clear and easy-to-read summary of where the G20 countries stand with respect to each of the SDGs.

This research provides a starting point for a closer assessment of sustainable development in the G20 countries, marking a constant point of reference over time. In this regard, ASviS proposes that the G20 countries embark on an ongoing, thorough process of monitoring their performance with respect to the 2030 Agenda, as a key aid to achieving the SDGs at global level.
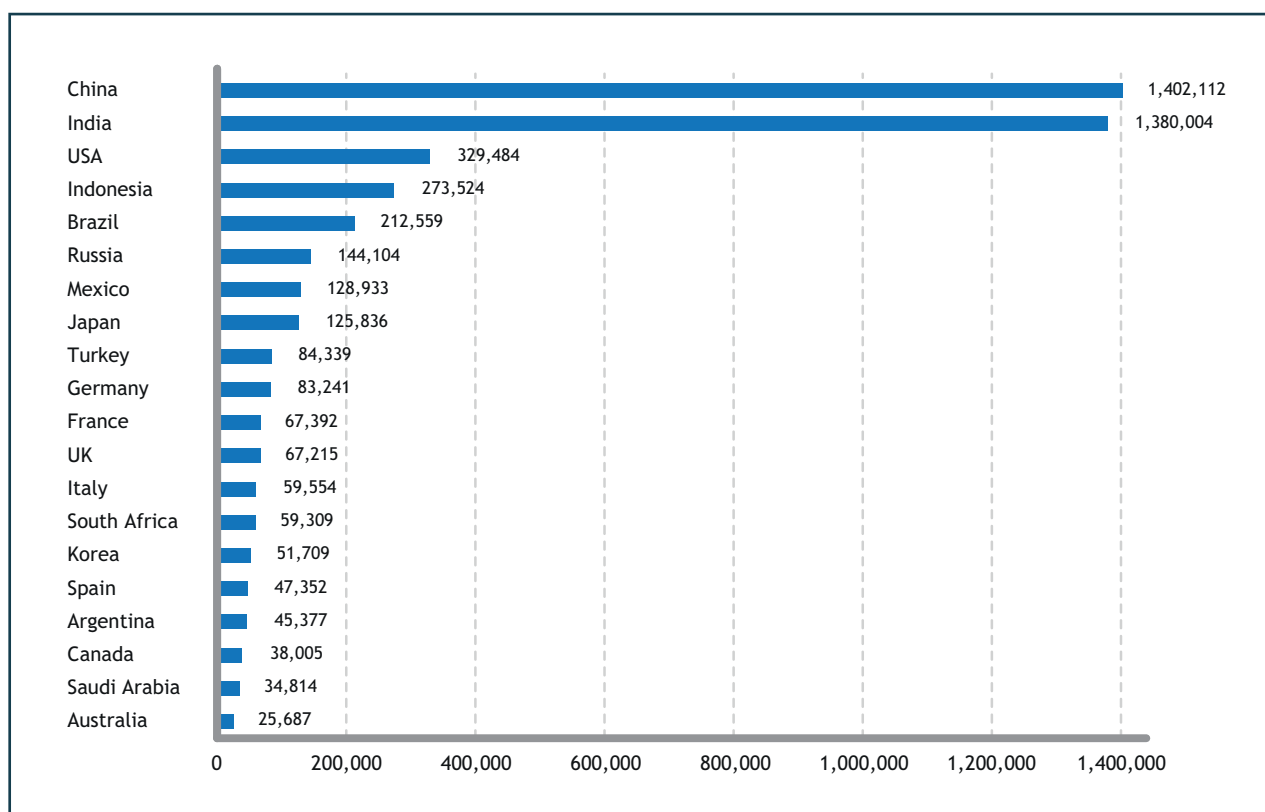
About the research

For the first time, and on an experimental basis, we are presenting an assessment of where the G20 countries stand with respect to the Goals in the 2030 Agenda. The experimental nature of the research reflects the number and distribution of the indicators for each Goal, but also the lack of historical data series and of indicators for a number of the 20 countries examined.

The research uses 57 basic indicators to rank the G20 countries[1]. These indicators are defined in Table 1 at the end of this chapter. The following pages show maps of the G20 member countries with respect to the 16 Goals[2]. The maps of the G20 countries are based on the available data for last year for each elementary indicator taken into account[3].

In any event, no data for 2020 was used, meaning that the assessment excludes any effects of the pandemic.

The G20 consists of the world's biggest economies. The group accounts for approximately 90% of global GDP, 75% of international trade, two-thirds of the world's population and around half of the earth's surface area. Given the heterogeneous nature of the different member states, limiting the ability to make direct comparisons between the various countries, the research represents an early experiment that, rather than draw up a ranking of G20 members, aims to arrive at an initial assessment of the state of sustainable development in the G20 countries.

Chart 1 - Total population of the G20 countries in millions of people (2020)

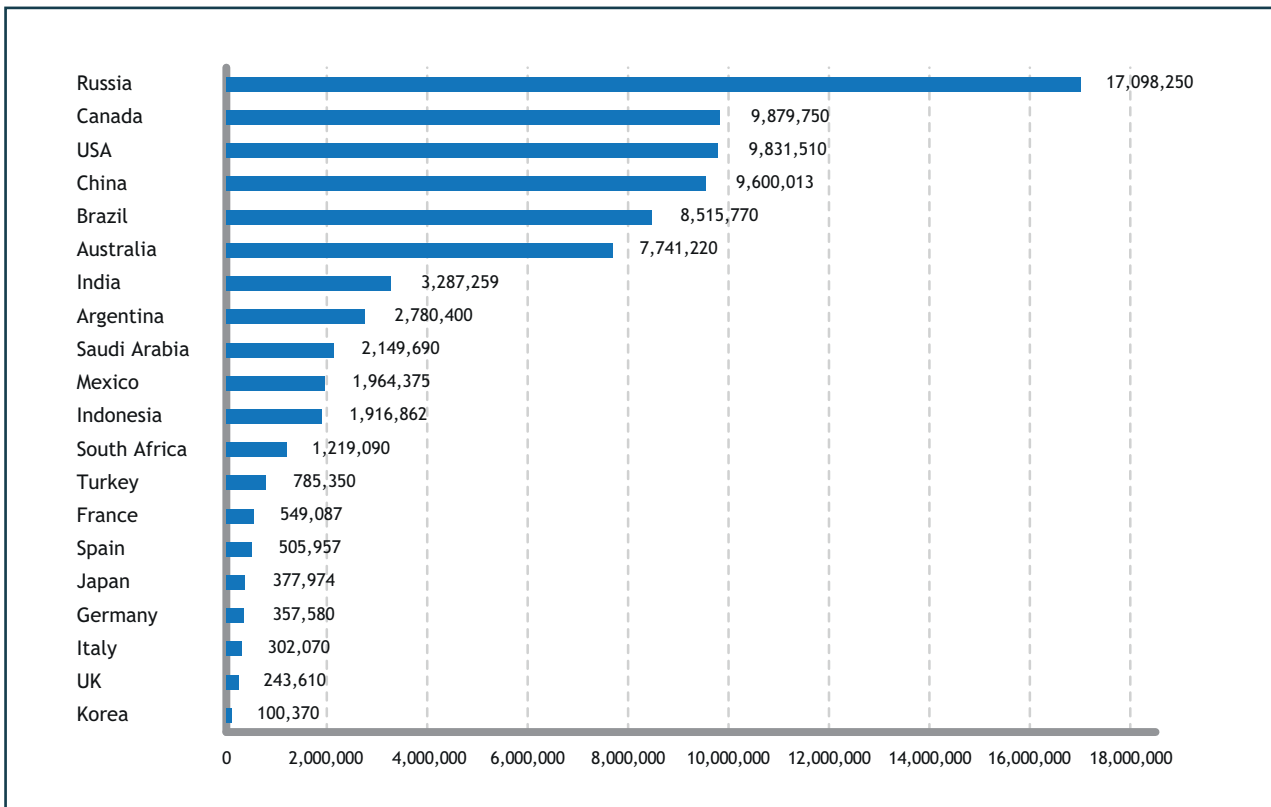| Country	Population
China	1,402,112
India	1,380,004
USA	329,484
Indonesia	273,524
Brazil	212,559
Russia	144,104
Mexico	128,933
Japan	125,836
Turkey	84,339
Germany	83,241
France	67,392
UK	67,215
Italy	59,554
South Africa	59,309
Korea	51,709
Spain	47,352
Argentina	45,377
Canada	38,005
Saudi Arabia	34,814
Australia	25,687

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[1] The research also takes into account, where possible, the performance of Spain, which has G20 observer status. In addition, due to the lack of available information it was not possible to rank the European Union.

[2] It was not possible to develop a composite indicator for Goal 17 due to the lack of data, whilst it was decided to use a single headline indicator for Goals 10 and 12.

[3] Given that this assessment does not take into account the performance over time, we chose to use the MPI (Mazziotta-Pareto Index) as a method for aggregating elementary indicators to arrive at a compositive measure.

Chart 2 - Total size of the G20 countries in square kilometres (2018)

Country	Size (km²)
Russia	17,098,250
Canada	9,879,750
USA	9,831,510
China	9,600,013
Brazil	8,515,770
Australia	7,741,220
India	3,287,259
Argentina	2,780,400
Saudi Arabia	2,149,690
Mexico	1,964,375
Indonesia	1,916,862
South Africa	1,219,090
Turkey	785,350
France	549,087
Spain	505,957
Japan	377,974
Germany	357,580
Italy	302,070
UK	243,610
Korea	100,370

In the following maps, the G20 countries are ranked with respect to each Goal[4]. The rankings are shown in a different colour based on the value of the composite indicator. The scale used as the basis for assigning the colours varies for each Goal, depending on the maximum and minimum scores for each SDG. This means that it is not possible to make a comparison between the different Goals.

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[4] The average for the G20 countries was calculated, throughout the assessment, as the simple average of all the countries with at least one score per indicator.

GOAL 1[5] - NO POVERTY

The composite indicator map for Goal 1 (regarding poverty) shows wide differences between countries that spend a greater amount on welfare compared with those that spend less. In particular, the assessment revealed evidence of positive situations in Australia, Canada, France, Germany, Japan, the UK and Russia. These countries stand out since at least 76% of vulnerable people are covered by social assistance, whilst their poverty rates are below 0.7%.

In contrast, the situation in Brazil, India, Indonesia, and South Africa is critical. No more than 37% of vulnerable people in these countries are covered by social assistance, whilst their poverty rates are above the average for the G20 (except for Indonesia, where the poverty rate is in line with the average). The most serious situation is in India, which has the highest poverty rate (22.5%) and the lowest proportion of vulnerable people covered by social assistance (10.4%), followed by South Africa, where the poverty rate is 18.7% and social assistance is provided to 35.6% of the most vulnerable.

The situation in the USA is also worthy of note, with fewer than 31% of vulnerable people covered by social assistance. This makes this country the fifth worst in the G20 with respect to this Goal.

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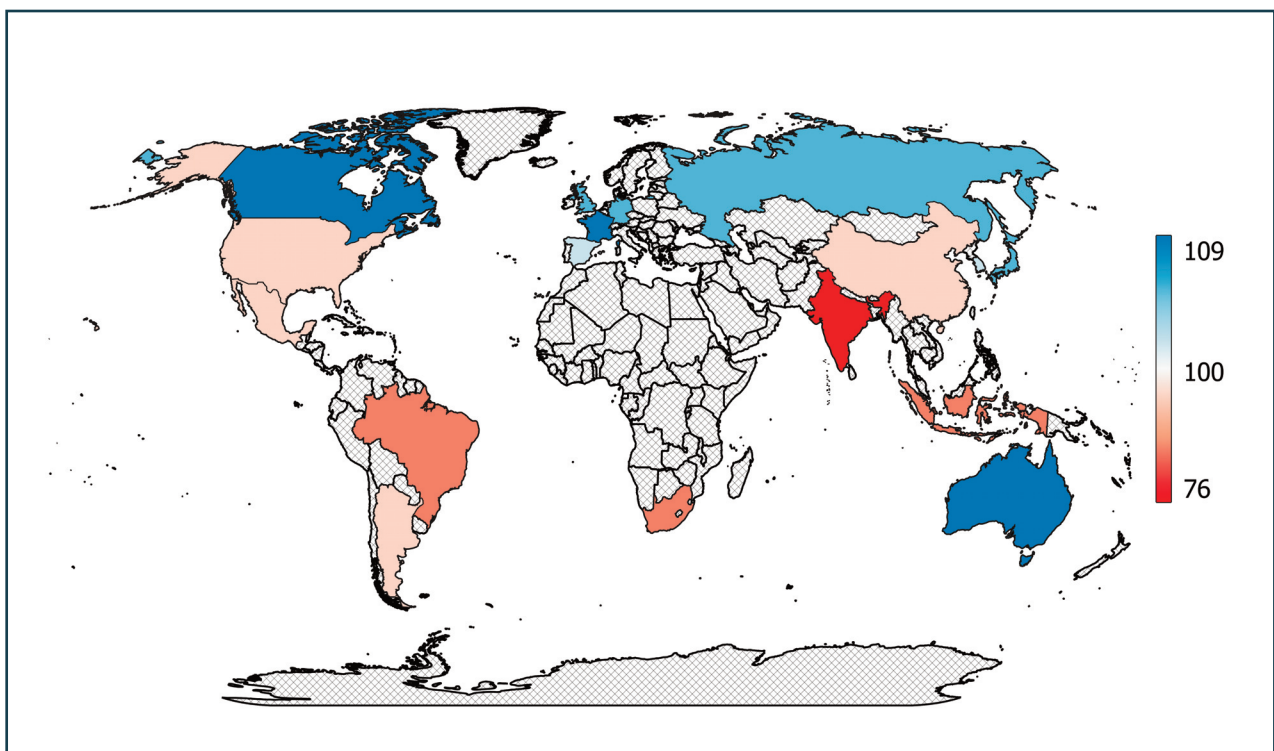
5   Due to the lack of data, it was not possible to compute a composite indicator for Italy, Saudi Arabia and Turkey.

GOAL 2 - ZERO HUNGER

The composite indicator map relating to agriculture and food security reveals similar situations in the different G20 countries. The assessment revealed particularly positive scenarios in Russia, Australia, Spain, and Canada. Compared with the average for the G20, these countries owe their success to good agricultural production, accompanied by a reduced environmental impact in terms of both use of fertilisers and plant protection products and methane emissions.

The composite indicators for Japan, the Republic of Korea and India are below the average. India's weaker performance is primarily due to its malnutrition rate of 14%, the worst of all the countries examined (the average for the G20 is 3.9%). The performances of Japan and the Republic of Korea reflect the major environmental impact of their agricultural sectors, in terms of both use of fertilisers and plant protection products and methane emissions. Above all, the Republic of Korea has the highest level of ammonia emissions among the countries examined and the most extensive use of fertilisers, exceeded only by China

(318.3 kg per hectare in Korea compared with an average of 147.7). Japan, on the other hand, is the biggest user of pesticides of all the G20 countries (23.6 tonnes per hectare compared with an average of 4.5).

Italy ranks as the fifth worst country among those examined (with a situation on a par with France and Germany), above all due to the use of plant protection products, which in Italy stands at approximately double the average for the G20, and to methane emissions in the agricultural sector.
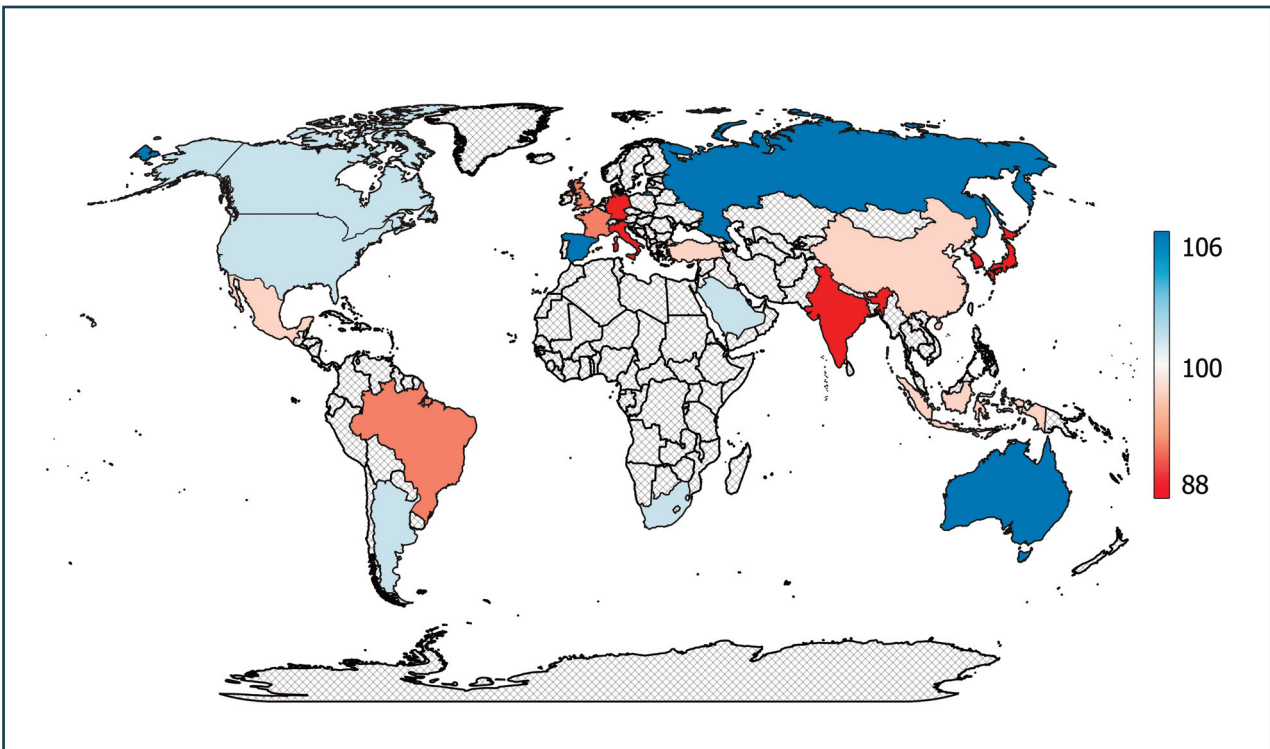
GOAL 3 – GOOD HEALTH AND WELLBEING

The composite indicator for health shows positive situations in Australia, Canada, Italy, Japan, Spain, the UK, and Germany, reflecting higher life expectancy at birth (above 80 years), lower rates of infant mortality and mortality from non-communicable diseases and lower rates of mortality caused by road traffic accidents. This situation reflects the fact that countries with the highest levels of per capita healthcare expenditure score higher than those with the lowest levels.

South Africa ranks lowest, followed by India and Indonesia, with the highest rates of infant mortality (the only countries to register rates of more than 20 per thousand live births) and critical situations regarding the availability of health workers and life expectancy at birth. South Africa's poor performance reflects life expectancy at birth (63.9 years) and the number of nurses and midwives, below all other G20 countries. Finally, Indonesia is the worst performer in terms of mortality from non-communicable diseases, tobacco use and the number of physicians, whilst Russia has the highest suicide rate.

Italy ranks second highest, outperformed only by Australia, thanks to above-average scores across all the indicators used. This includes life expectancy (83.3 years compared with an average of 77.9) and an infant mortality rate of 2.7 per thousand live births versus the average of 8.2.
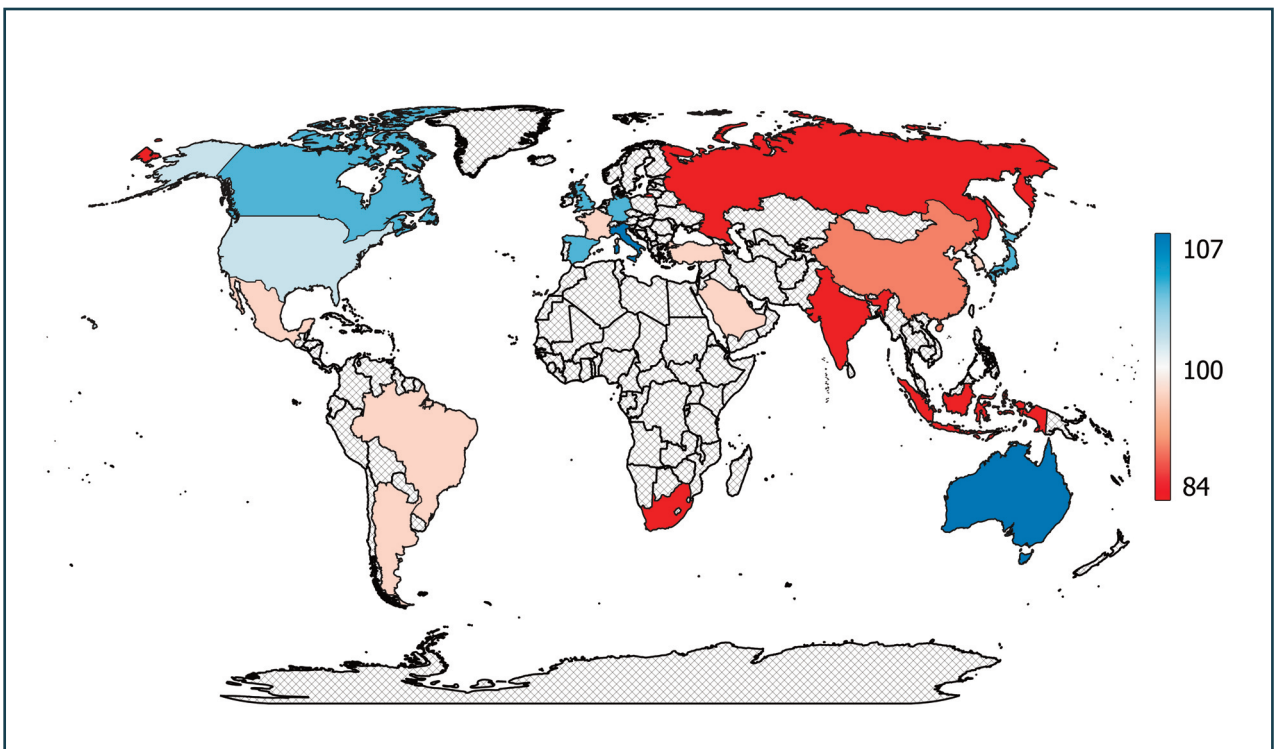
GOAL 4 - QUALITY EDUCATION

A look at the map for Goal 4 (Quality education) shows some of the largest disparities between G20 countries[6], above all between European countries, the USA, Australia and Korea, on the one hand, and the other members of the G20 on the other.

The best-performing countries are Australia, the UK and Germany, who rank highest on a number of fronts, such as over 70% of the population having completed secondary education. Australia, for example, has the highest number of children enrolled in early childhood education and the longest school life expectancy (20.5 years in Australia compared with an average of 15.9), whilst the UK boasts the highest proportion of people completing middle school (99.7% compared with an average of 74.5%).

India, Indonesia and China are the lowest ranked, with school life expectancy well below the average for the countries examined. India has the worst performance, with the lowest ranking for school life expectancy (11.5 years) and the proportion of people completing middle school (37.6%). China's poor performance is due to the proportion of the population with at least one secondary school qualification, which stands at 22.3% compared with an average of 60.3%. Indonesia's position, on the other hand, reflects the low level of kindergarten participation among boys and schools, equal to 62.3% compared with an average of 80%.

Italy ranks ninth, having registered the worst performance among the European countries. This reflects the proportion of the population with a secondary school qualification, standing at 49.2% compared with the average for the G20 of 60.3%. The other indicators are above average.
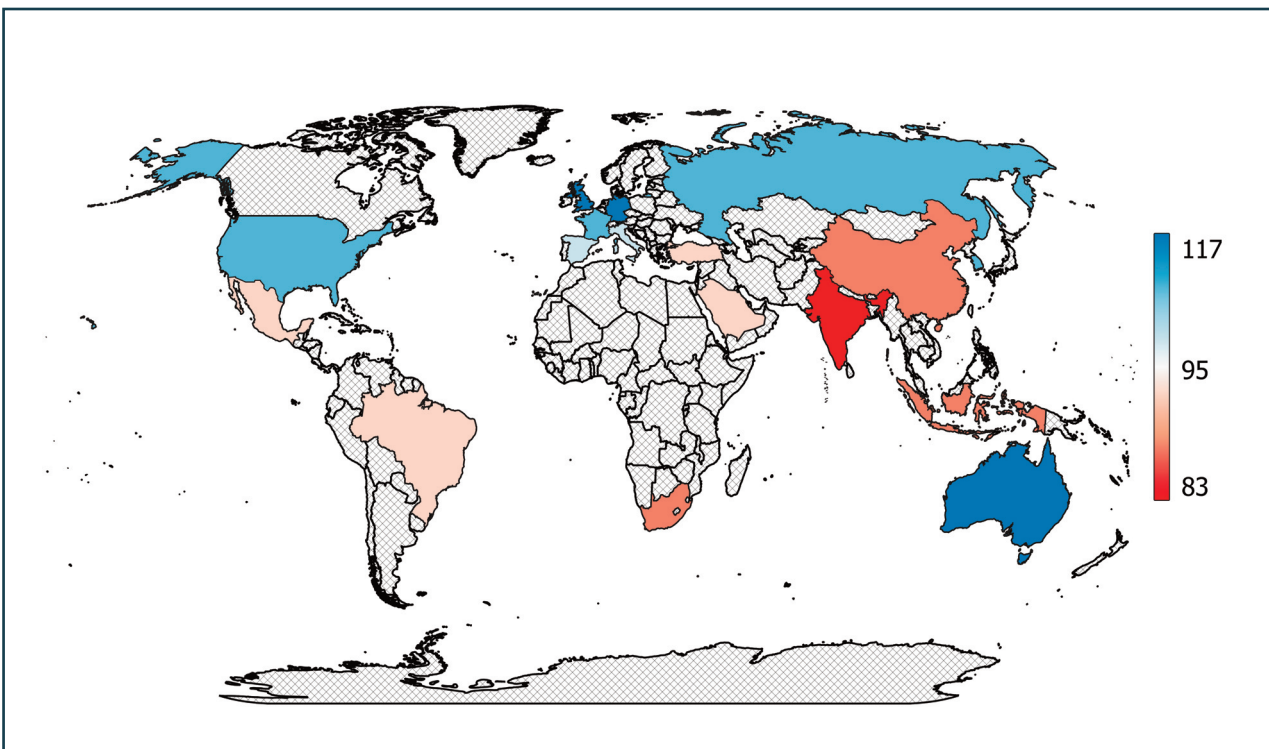
6   Due to the lack of information, it was not possible to compute a composite indicator for Japan and Canada.

GOAL 5 - GENDER EQUALITY

There also wide disparities between G20 member states regarding gender equality. The assessment results in positive rankings for France, Germany, Spain, and the UK, who share rates of female participation in the labour force of over 82% and proportions of women in ministerial positions and in national parliaments in excess of 30%. The proportion of ministerial positions in France and Spain occupied by women is above average at 66.7% and 52.9%, respectively, whilst the UK boasts the highest proportion of women who use modern methods of contraception (82%) and the highest rate of female participation in the labour force (85.4%).

The lowest ranked countries are Saudi Arabia, India, Turkey, and Japan. Saudi Arabia is the worst performer, with the lowest proportion of women who use modern methods of contraception (20.8%), the lowest number of women in ministerial positions (0%) and the lowest rate of female participation in the labour force (19.9%). India, Turkey, and Japan rank below the average in terms of both women management positions and the use of modern methods of contraception. In addition, female participation in the labour force is below average in India and Turkey.

Italy ranks ninth, with female participation in the labour force and the proportion of women who use modern methods of contraception below the average for the G20.
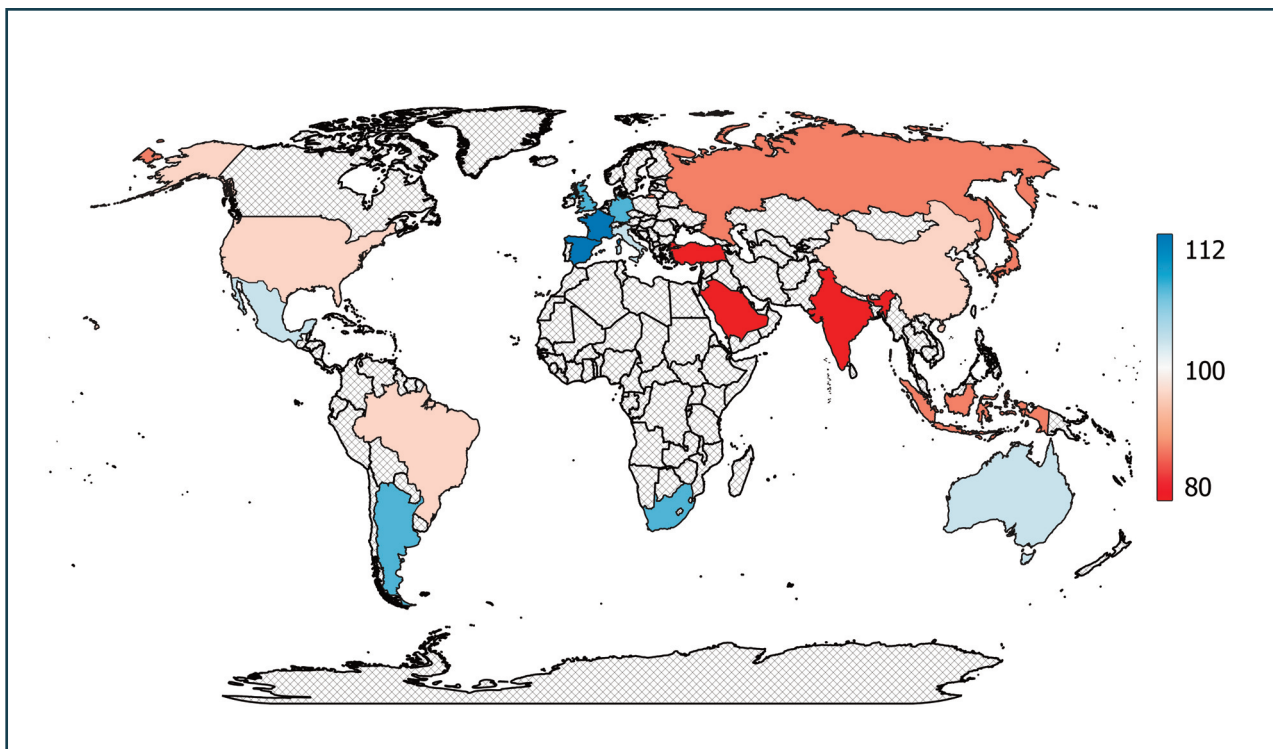
GOAL 6 - CLEAN WATER AND SANITATION

In terms of Goal 6 (Clean water and sanitation), the highest ranked countries are Australia, those in Europe and North America, Japan, and South Korea. Ober 98% of people in these countries have access to basic sanitation services, whilst more than 99% of their populations have access to drinking water. These countries also have a level of water stress below 58%.

Saudi Arabia, India, Indonesia and South Africa register negative performances. These countries' low rankings reflect limited access to sanitation services drinking water. Saudi Arabia, on the other hand, ranks highest in terms of these two indicators (100%), but is let down by a remarkably high level of water stress: 1242.6% in 2014, more than 15 times the average recorded by the remaining G20 countries in the same year[7]. India is the lowest ranked due to the critical number of people with access to basic sanitation services: just 59.5% in 2017 compared with an average of 92.7%.

Italy ranks tenth, with a composite indicator in line with the other European countries and a performance above the average for the G20 across all the indicators taken into account.

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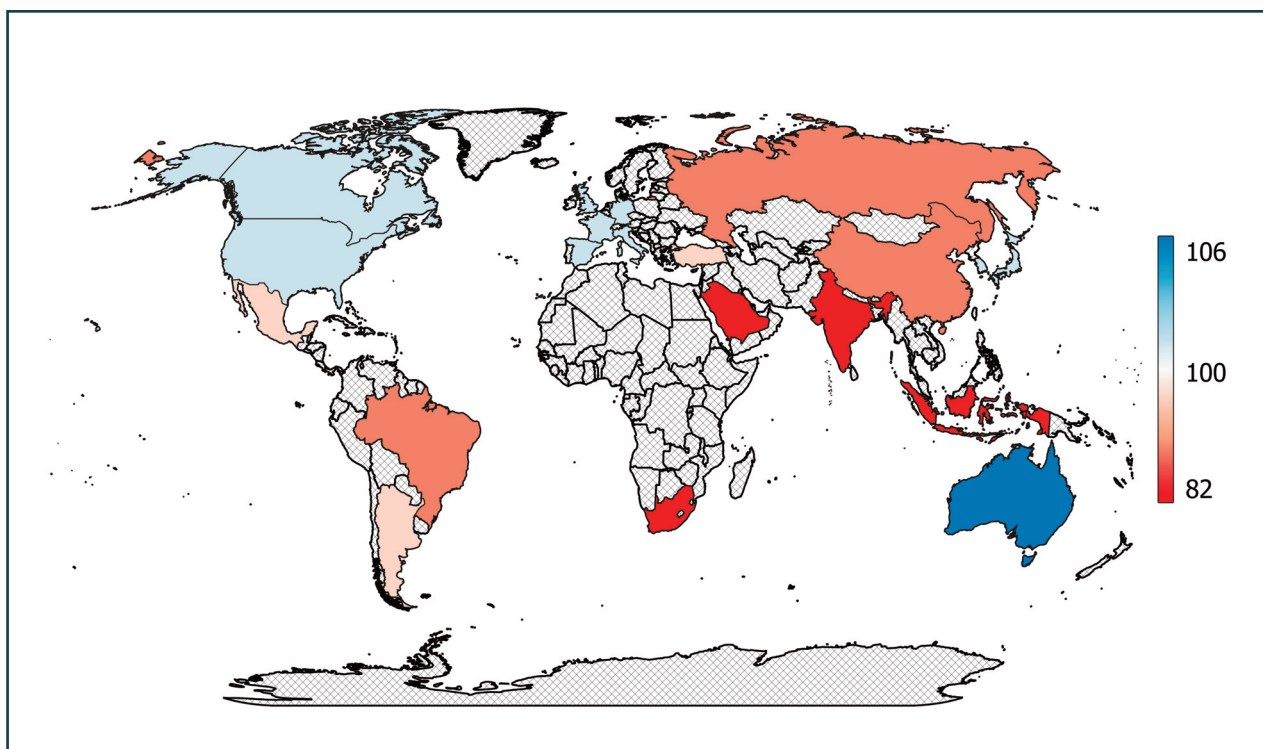
[7] The unusual figure reflects the fact that, due to the country's extreme aridity and lack of water resources, Saudi Arabia extracts most of its water from aquifers, which are not a renewable water source.

GOAL 7 - AFFORDABLE AND CLEAN ENERGY
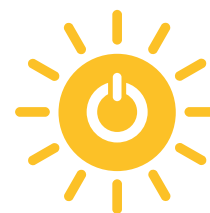
The assessment of Goal 7 (Affordable and clean energy) reveals significant differences between the G20 countries. Differences that do not match those observed in relation to the economic and social Goals. The research highlights the positive situations in Brazil, Indonesia, Italy, Spain, and Turkey, with Brazil and Turkey assigned the two best composite indicators. Brazil boasts the highest amount of renewable energy as a proportion of total final energy consumption (43.8%), following by Indonesia with 36.9%, whilst the average for the G20 countries is 15.1%. Turkey is best in terms of energy intensity, whilst Italy and Spain are above average regarding both the use of renewables and energy intensity.

Across all the G20 countries, except for India, Indonesia and South Africa, 100% of the population has access to electricity. The lowest ranked in this regard is South Africa, where 91.2% of the population had guaranteed access to electricity in 2018 and which has the worst level of energy intensity (8.7 MJ/$2011 PPP GDP in 2015 compared with an average of 4.9). Saudi Arabia also performs badly due to the extremely low level of renewable energy used (0.01%), whilst

South Korea and Russia have low rankings due once again to the low level of renewable energy used (2.7% and 3.3%, respectively) and above-average levels of energy intensity.

Italy ranks third behind Brazil and Indonesia thanks to the highest amount of renewable energy as a proportion of total final energy consumption and a better level of energy intensity with respect to the countries examined.
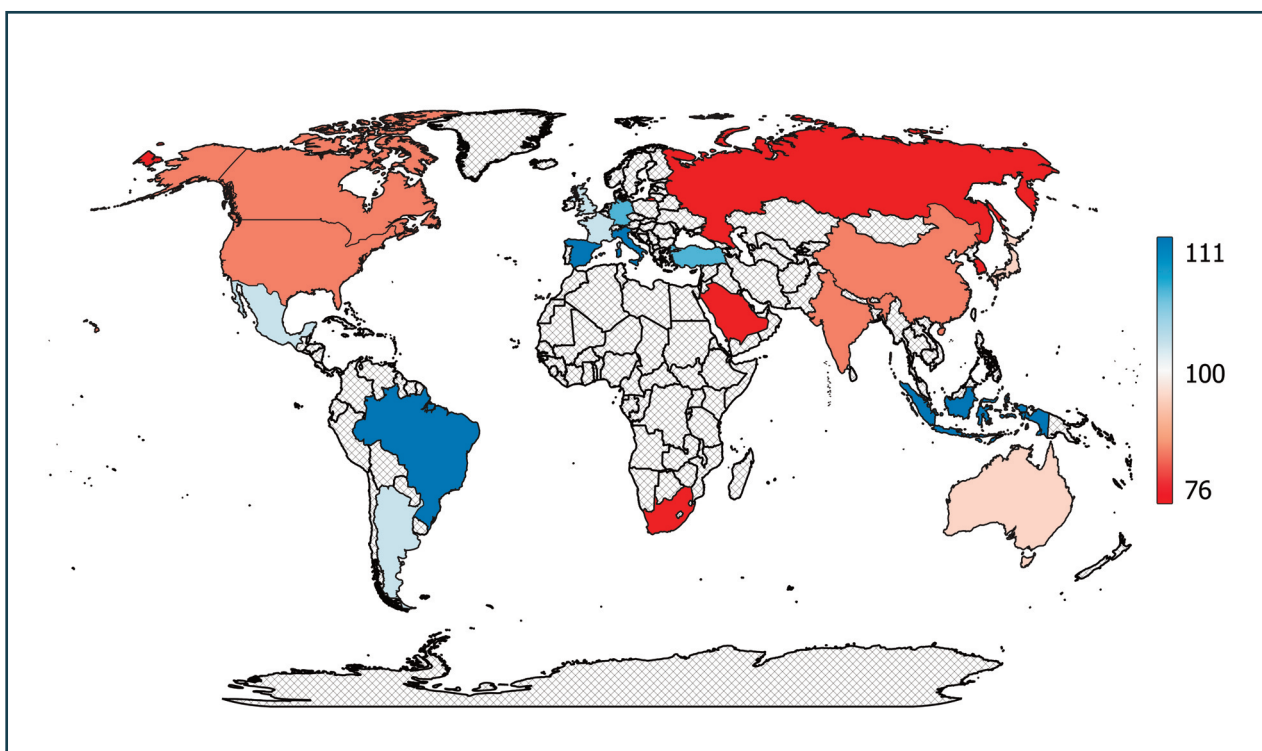
GOAL 8 – DECENT WORK AND ECONOMIC GROWTH

The assessment relating to decent work and economic growth showed up the smallest differences with respect to the 2030 Agenda. Looking at the individual indicators, China is in a positive position, thanks to its per capita rate of GDP growth (5.6% compared with an average of 0.9%) and the rate of growth in output per worker, which stands at 6.6 compared with an average of 0.6 for the G20. The USA is the highest ranked in terms of underemployment and vulnerable employment, which stand at 4.4% and 3.9%, respectively, compared with averages of 11.9% and 19.4% for the G20.

The lowest ranked countries are South Africa, Argentina, and Mexico, where the per capita rate of GDP growth was negative in 2019 and where less than 72% of people have an account with a financial institution. South Africa performs worst in terms of underemployment (32.2%) and unemployment rate (36.7%), followed by Argentina, which ranks lowest in terms of annual per capita rate of GDP growth (-3.1%) and rate of growth in output per worker (-3.0%). Finally, India finds itself in a critical situation, having the worst levels of per capita GDP growth and vulnerable employment (73.8% compared with an average for the

G20 of 19.4%) and the lowest proportion of the population in receipt of a pension (25.2%).

Italy ranks thirteenth, performing below the average for the G20 because it has below-average rates of growth in GDP and in output per worker with respect to the other countries examined.
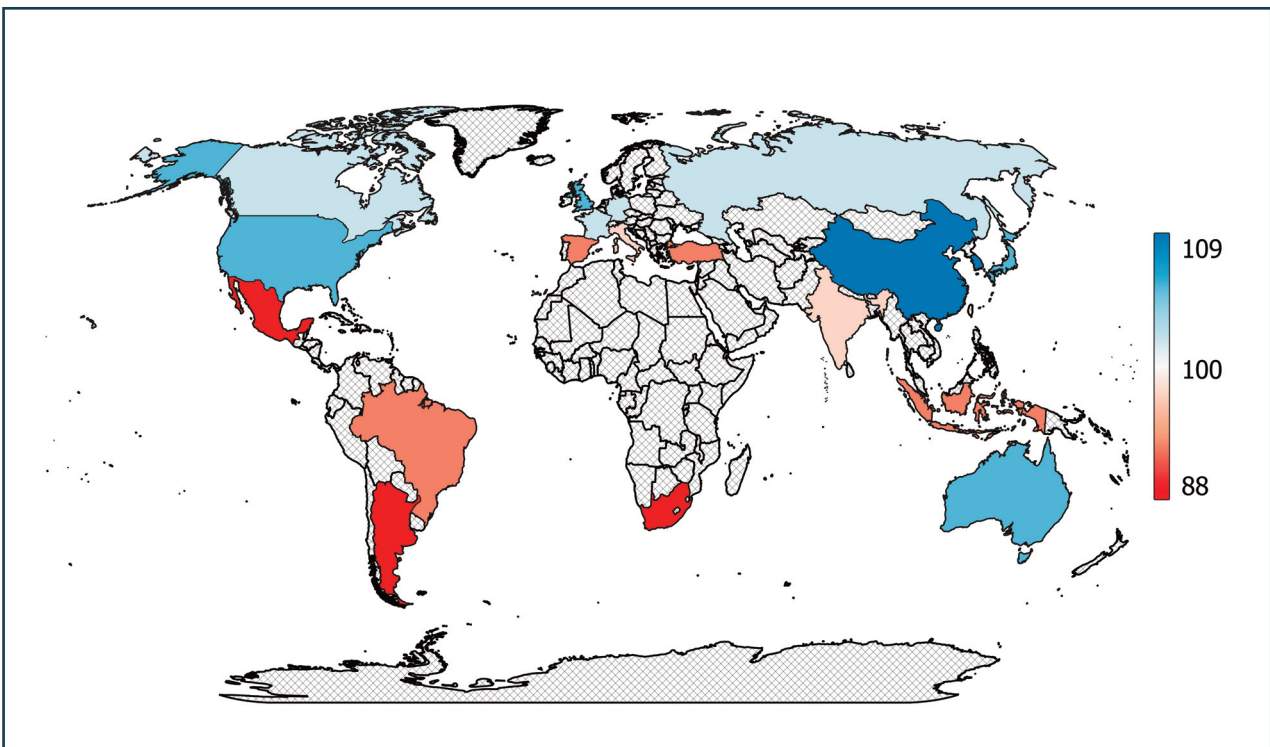
GOAL 9 - INDUSTRY, INNOVATION AND INFRASTRUCTURE

The map of composite indicators relating to innovation and research shows that there are significant differences between G20 countries. The assessment reveals positive performances from South Korea, Germany, Japan, France, the USA, and the UK, primarily in terms of the number of individuals using the internet and broadband subscriptions, which in these countries exceed 82% and 34% of the population. South Korea is the highest ranked in terms of medium- and high-tech manufacturing (63.8%), the number of individuals using the internet (96%) and public spending on research and development (4.8% of GDP).

The worst performers are India, Indonesia, and South Africa, in all three cases reflecting public spending on research and development below 0.8% of GDP, a number of individuals using the internet lower than 56.2% of the population and broadband subscription rates below 2.4%.

Italy ranks ninth, with elementary indicators in line with the average for the G20, except for the figures for spending on research and development

and the proportion of people who use the internet, with levels below, albeit slightly, the average for the countries examined.
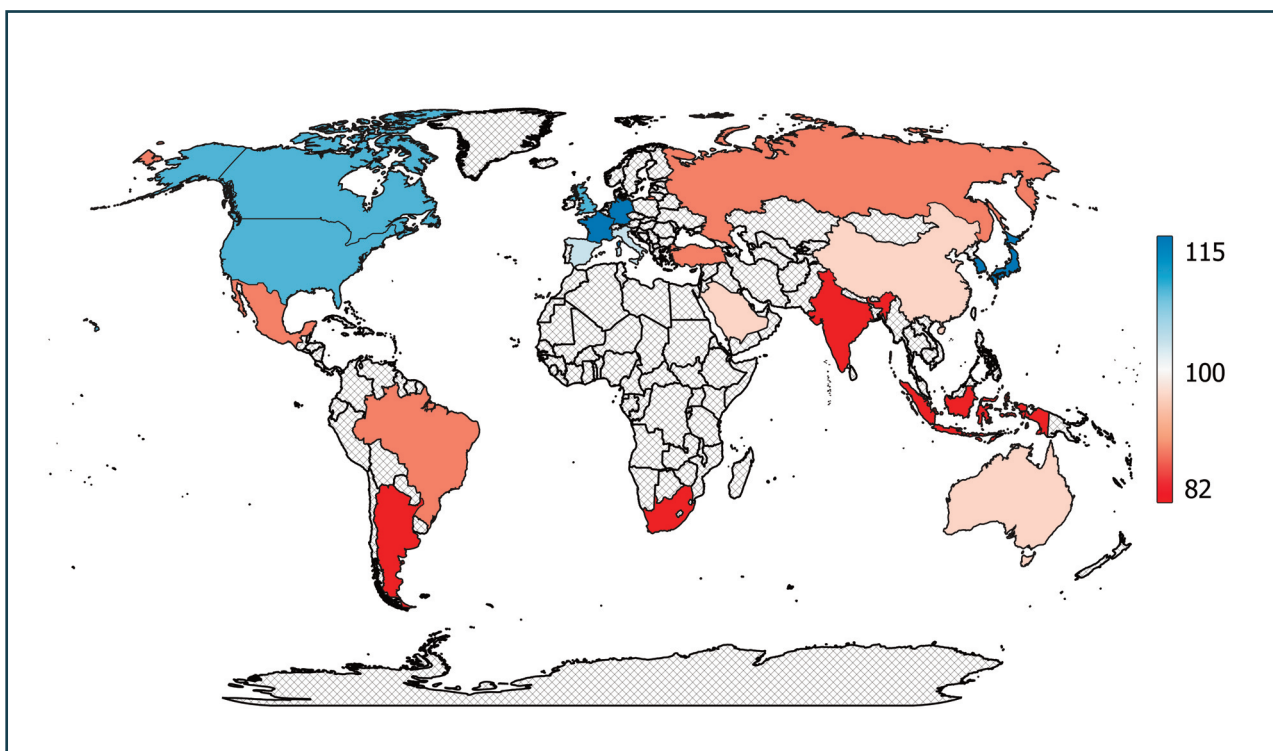
GOAL 10 - REDUCED INEQUALITIES
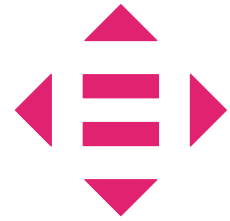
Due to the lack of information for Goal 10 (Reduced inequalities), it was only possible to select a single headline indicator based on the Gini index or coefficient. This measures the distance a country has to make up to achieve ideal level of income distribution (in the event of perfect equality in income distribution the index is 0). The research highlighted the greatest degree of disparity between the G20 countries .

The highest ranked countries based on the index used are South Korea, Germany, and France, with coefficients of 31.4, 31.9 and 32.4.

South Africa has the worst Gini coefficient (63.0), with only Brazil coming close (53.4).

Italy ranks tenth, with a coefficient of 35.9.

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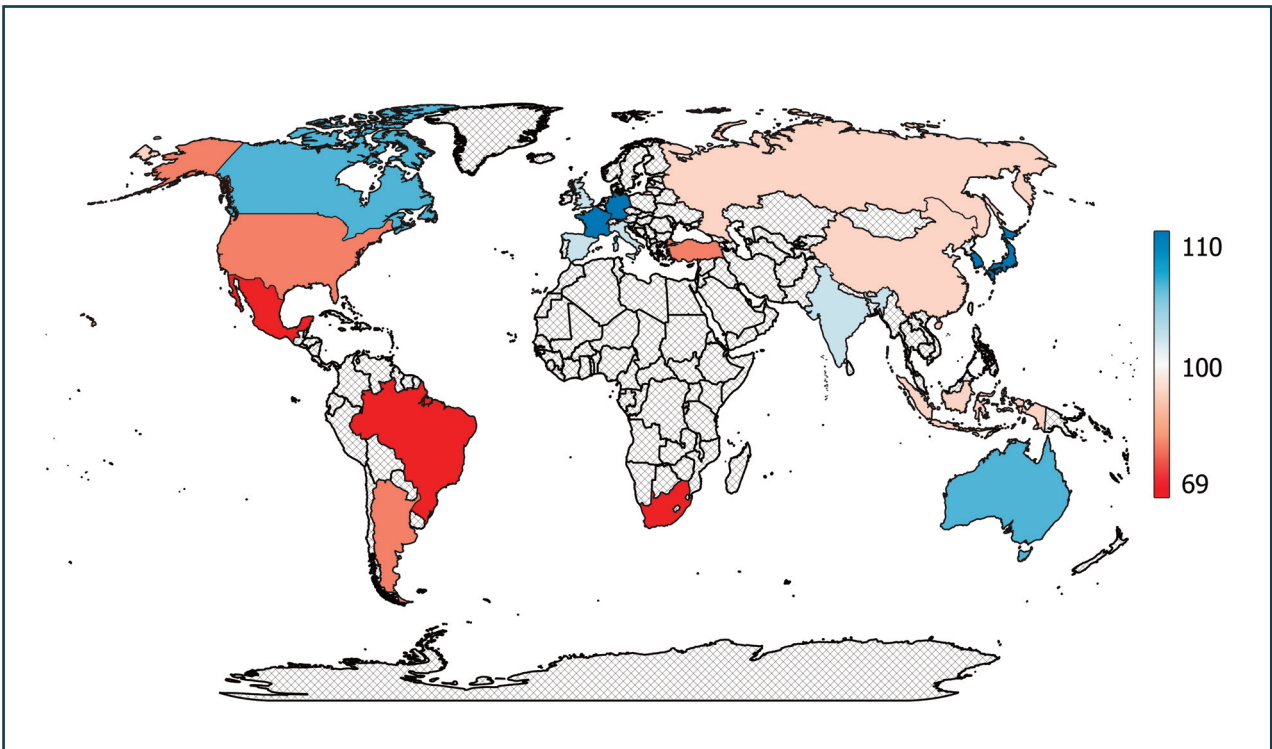
8   Due to the lack of data, it was not possible to compute the index for Saudi Arabia.

GOAL 11 - SUSTAINABLE CITIES AND COMMUNITIES

It was again only possible to select a single headline indicator for Goal 11 (Sustainable cities and communities). This measures the annual average concentration of ambient particulate matter (PM 2.5). The highest ranked countries were Canada, the USA and Australia, which all had annual average concentrations of PM 2.5 below nine micrograms per cubic metre. Canada performed best among all the G20 countries (6.4 micrograms per cubic metre).

India and Saudi Arabia recorded the worst performances. Which have the highest annual average concentrations of PM 2.5 in the air: 90.9 and 87.9 micrograms per cubic metre, respectively, in 2017.

Italy ranks thirteenth, with an indicator of 16.7 compared with an average of 24.5.
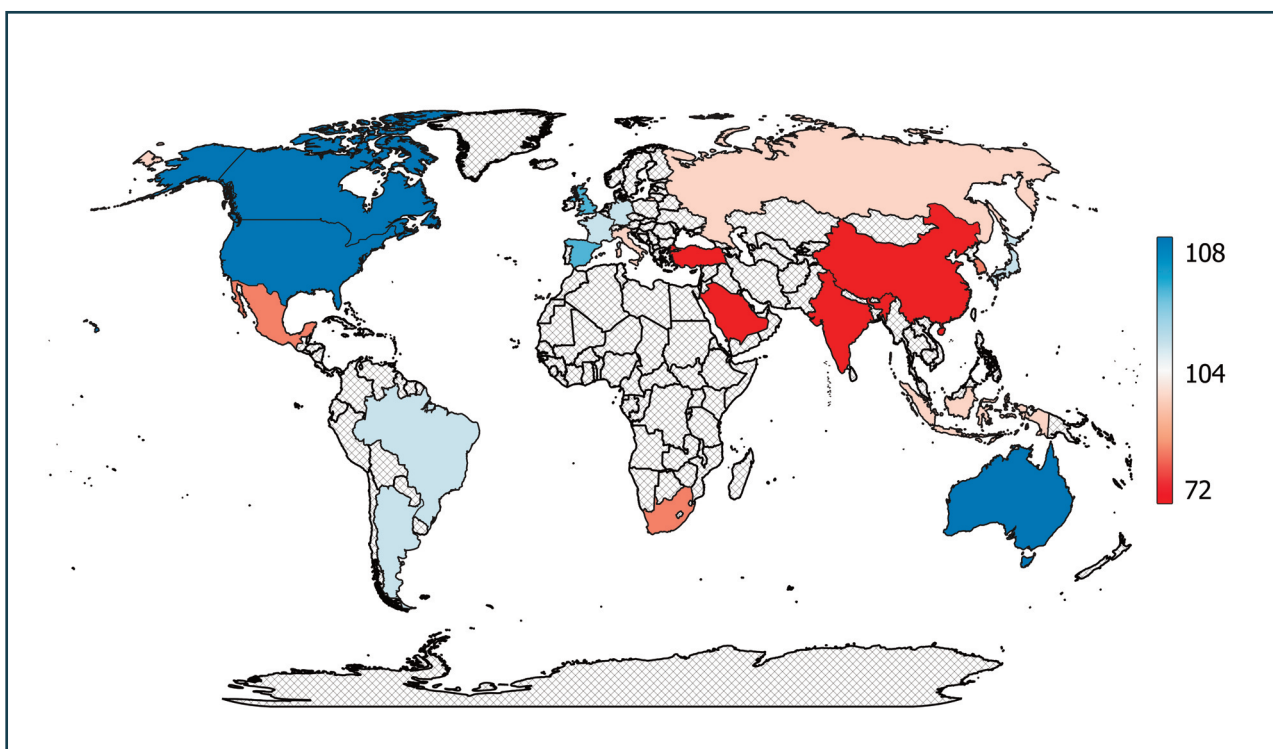
GOAL 12 - RESPONSIBLE CONSUMPTION AND PRODUCTION
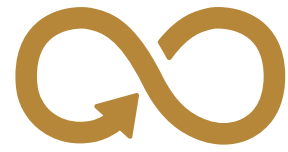
Two indicators were chosen for the assessment of Goal 12 (Responsible consumption and production): i) domestic consumption of materials, based on the quantity of materials (tonnes per capita) consumed by an economy, consisting of materials extracted or harvested within the country, plus imported materials and products; ii) material productivity based on the amount of economic output generated (in terms of GDP) per unit of material consumed. The UK, Italy and Japan were the highest ranked countries, with all three having rates of material productivity in excess of US$4.6 per kg and per capita domestic consumption of materials significantly below the average for the G20 countries (14.6). India and Indonesia also performed well in terms of per capita domestic consumption of materials at 5.5 and 7.4 tonnes per capita, but the overall result as affected by poor material productivity.

At the other end of the scale, Australia, Canada, and China recorded the worst performances in terms of per capita domestic consumption of materials, with rates of 37.7, 28.7 and 24.7 tonnes per capita. China also ranked lowest for resource productivity at US$0.6 per kg, compared with an average of US$2.5.
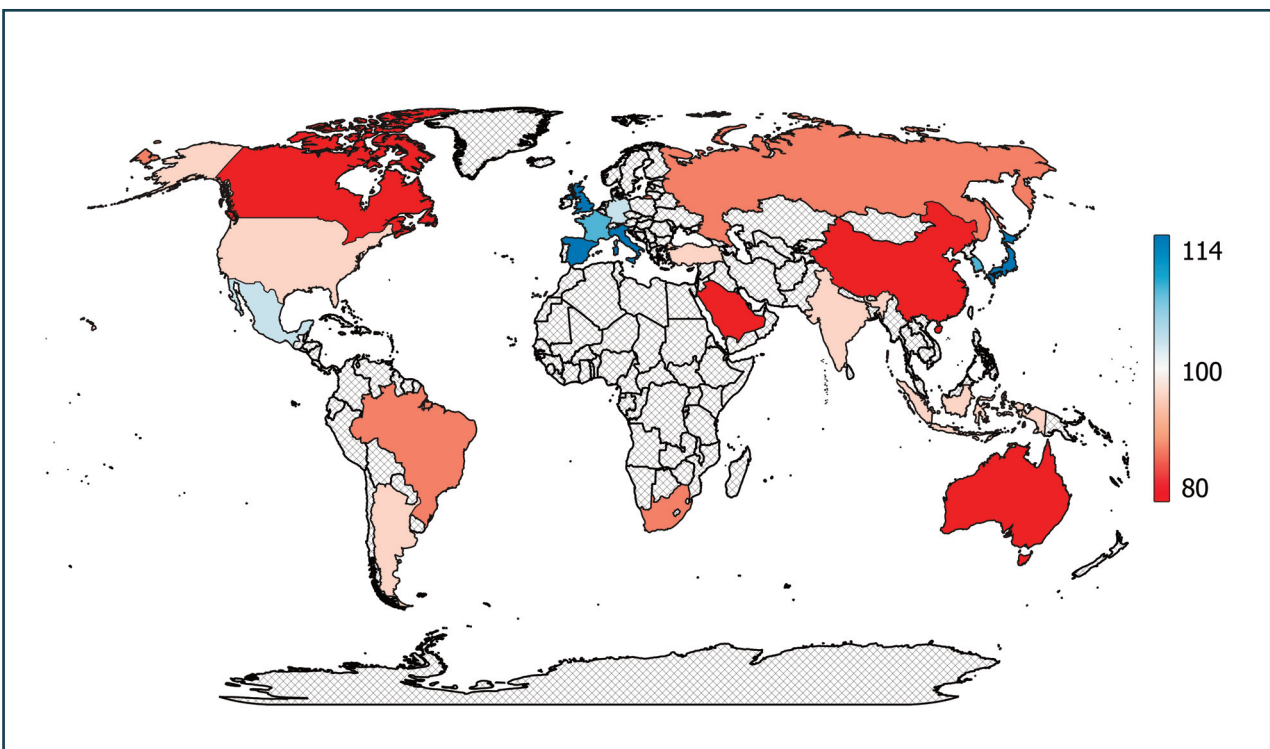
GOAL 13 - CLIMATE ACTION

Two elementary indicators were taken into account in assessing Goal 13 (Climate action): "direct" CO_2 emissions, meaning emissions produced in the country concerned, and "indirect" CO_2 emissions, based on an estimate of the emissions embodied in a country's imports. Brazil, India, Indonesia, and Mexico were the highest ranked countries, with all four emitting less than 3.9 tonnes of CO_2 per capita and having emissions embodied in imports of less than 0.45 tonnes of CO_2 per capita. The best country on this measure as India, with the lowest levels of both direct and indirect emissions (1.8 and 0.07 tonnes of CO_2 per capita, respectively).

Canada, Germany and Saudi Arabia recorded negative performances, with per capita emissions of between 8.8 tonnes of CO_2 and 17.4 tonnes of CO_2, whilst the UK and Australia recorded the highest figures for emissions embodied in imports (3.0 and 3.1 tonnes of CO_2 per capita, respectively).

Italy ranks eighth, with direct emissions below and indirect emissions above the respective averages.
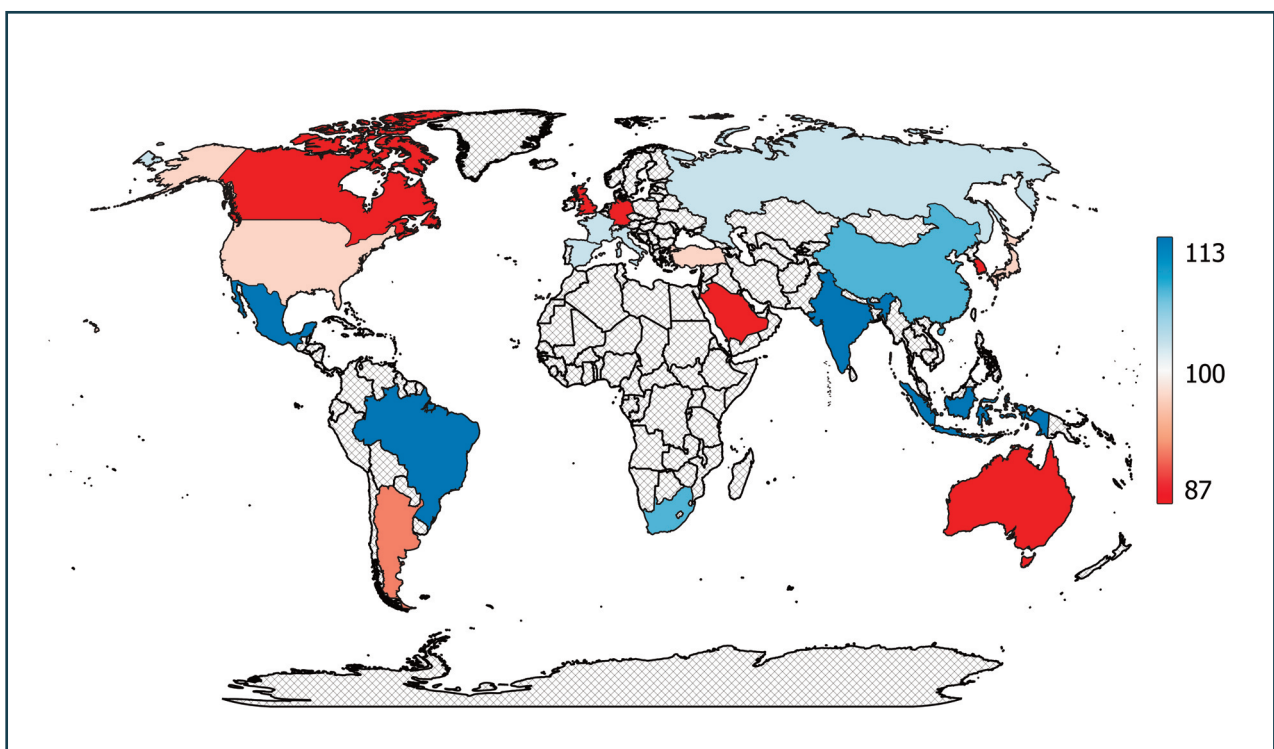
GOAL 14 - LIFE BELOW WATER
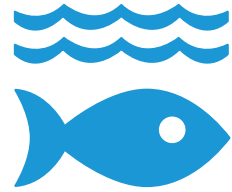
The assessment of the quality of marine ecosystems ranks France and Germany highest in terms of the proportion of territorial waters designated as marine protected areas (45.1% and 45.4%, respectively). The UK and Brazil also rank highly in terms of the share of fish caught from overexploited stocks (below 32%) and the size of marine protected areas, which cover more than 26.6% of the countries' territorial waters.

The lowest ranked countries are Argentina, Italy, and Japan, where the share of fish caught from overexploited stocks is above 70% and marine protected areas account for less than 9% of territorial waters. Spain, Indonesia, and Canada are also worth mentioning in terms of having the lowest proportion of marine protected areas (0.1%, 0.2% and 0.9%, respectively).

Italy is the next to lowest ranked country, followed only by Argentina, where in 2014 75.1% of fish caught was from overexploited or collapsed stocks, and where in 2018 marine protected areas accounted for just 8.8% of the country's territorial waters.
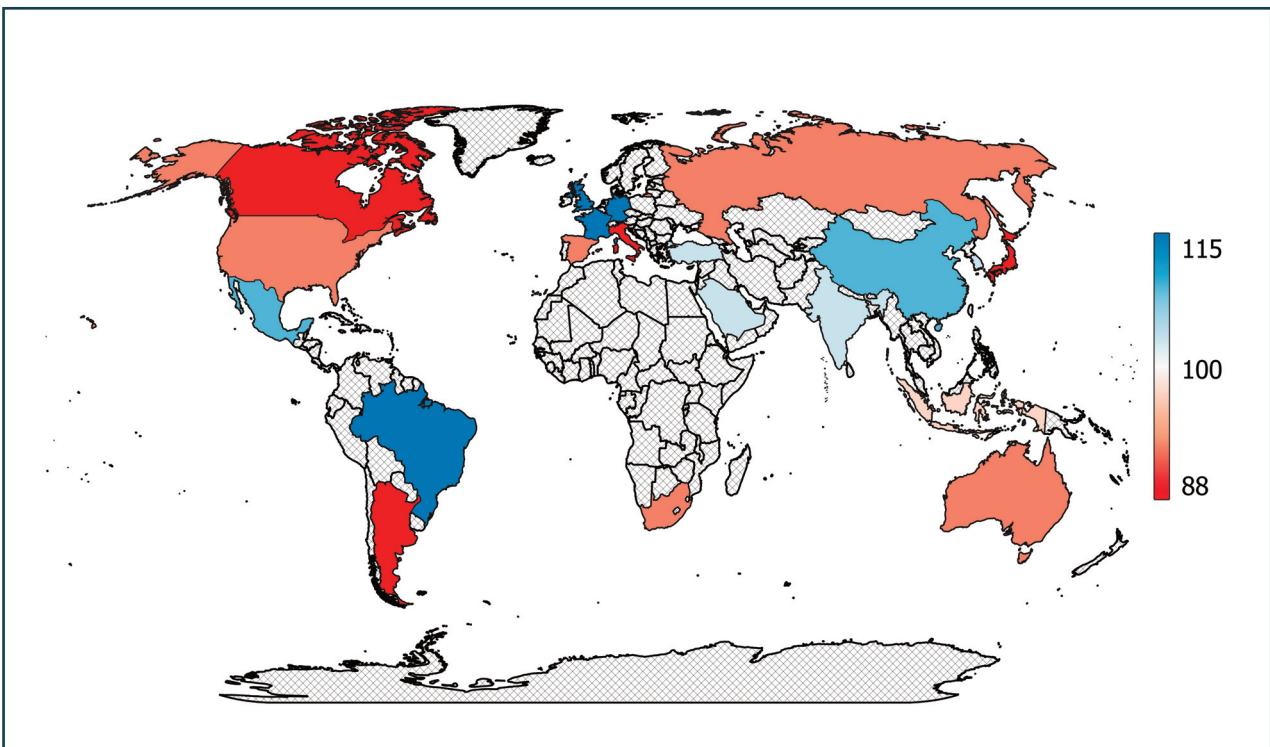
GOAL 15 - LIFE ON LAND

The assessment of terrestrial ecosystems assigned the highest rankings to Brazil, Japan, Russia, Germany and France. The first three because they have forest areas occupying over 49.7% of their national territory, whilst France and Germany have terrestrial protected areas that account for over 25.7% of their national territory, with Germany registering the highest figure among all the G20 countries (37.8%).

The lowest ranked countries are South Korea, Saudi Arabia, and Turkey. Despite having a large amount of forest area (64.7% of its national territory in 2018), South Korea has seen the highest rate of vegetation loss of all the countries (16.8%). As well as South Korea, the performances of Brazil, Indonesia and Japan are also concerning in this regard. Despite an abundance of forest area (59.7%, 49.7% and 69.4% of national territory, respectively), these countries are seeing the highest rates of vegetation loss after South Korea (6.2%, 9.3% and 4.7%, respectively). Saudi Arabia and Turkey, on the other hand, both have terrestrial protected areas that make up less than 8% of national territory, with Turkey trailing everybody else in the group (with protected areas accounting for 0.2% in 2018).

Italy ranks thirteenth, with its above-average proportion of protected areas offset by a rate of vegetation loss that is higher than the average for the G20 countries.
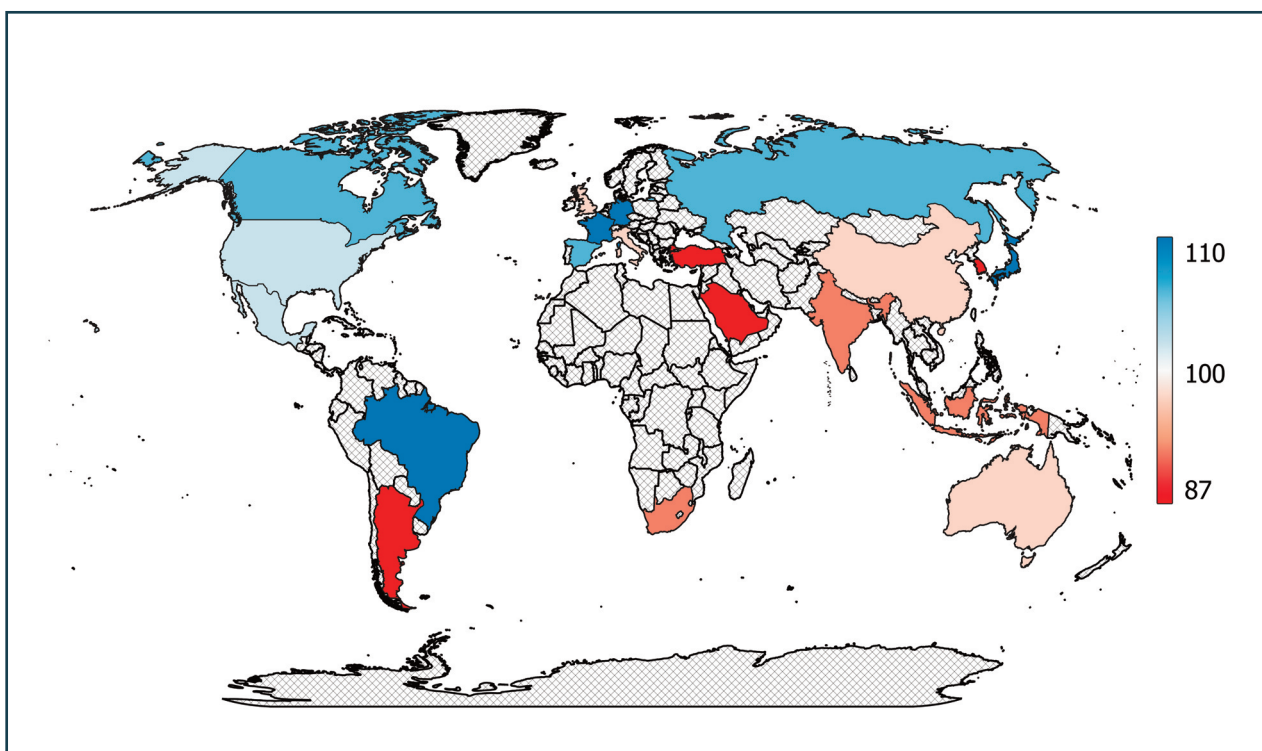
GOAL 16 – PEACE, JUSTICE AND STRONG INSTITUTIONS

The composite indicator for justice and institutions ranks Australia, Canada, Germany, Japan, and the UK highest, with all these countries having corruption perception indices over or equal to 74 (100 is the highest possible score). Japan stands out for the fact that it also boasts the lowest rate of intentional homicides at 0.3 per 100,000 people.

In contrast, Brazil, Mexico, and South Africa are the lowest ranked based on both indicators: their intentional homicide rates (27.4, 29.0 and 35.9 per 100,000 people, respectively) are well above the average of 6.1 for the G20 as a whole; the corruption perception indices of all three countries are over or equal to 44.

Italy ranks tenth, with a below-average intentional homicide rate and a corruption perception index in line with the average for the G20 countries.
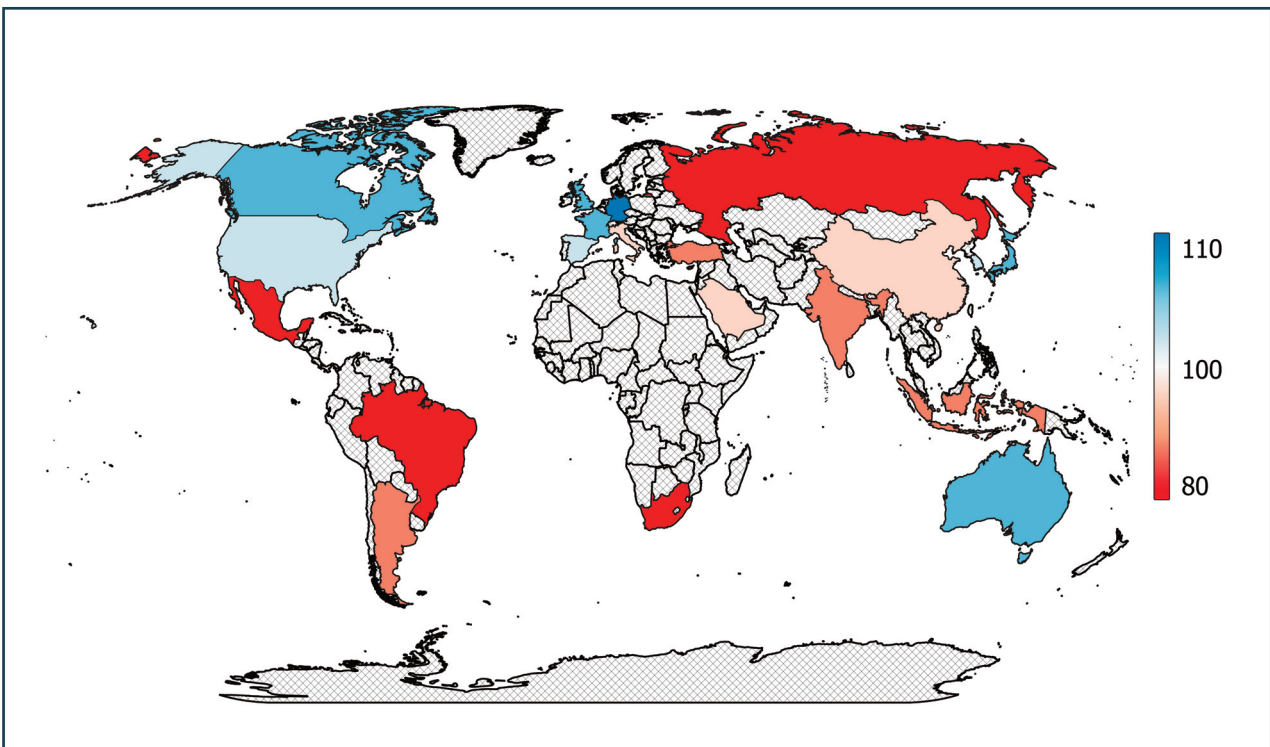
Table 1 – List of elementary indicators used to construct composite indicators for the G20 countries and their polarity (a "+" sign indicates that an increase in the elementary indicator helps to boost or improve the composite indicator, whilst a "-" sign indicates a negative contribution to its performance)

Indicator	Polarity
GOAL 1	
Vulnerable persons covered by social assistance	+
Poverty headcount ratio at US$ 1.90/day	-
GOAL 2	
Gross value added of the agricultural industry	-
Prevalence of overweight	-
Prevalence of undernourishment	-
Food production index (2014-2016 = 100)	+
Use of fertilizers	-
Use of plant protection products	-
Agricultural methane emissions	-
GOAL 3	
Life expectancy at birth	+
Mortality from CVD, cancer, diabetes or CRD between exact ages 30 and 70	-
Infant mortality rate	-
Mortality caused by road traffic injury	-
Suicide mortality rate	-
Prevalence of current tobacco use	-
Total alcohol consumption per capita	-
Number of physicians per 1000 inhabitants	+
Number of nurses and midwives per 1000 inhabitants	+
GOAL 4	
Population ages 25 and over that attained or completed lower secondary education	+
Population ages 25 and over that attained or completed upper secondary education	+
Pre primary school enrollment	+
School life expectancy	+
GOAL 5	
Proportion of women in ministerial level positions	+
Ratio of female to male labor force participation rate	+
Proportion of women in national parliaments	+
Proportion of women practicing at least one modern contraceptive method	+
GOAL 6	
People using at least basic sanitation services	+
Proportion of population using basic drinking water services	+
Freshwater withdrawal as a proportion of available freshwater resources	-
GOAL 7	
Access to electricity	+
Renewable energy consumption	+
Energy intensity level of primary energy	-

GOAL 8

GDP per capita	+
Proportion of people aged 15 years and over with an account at a financial institution or mobile-money-service provider	+
Annual growth rate of real GDP per capita	+
Persons above retirement age receiving a pension	+
Time-related underemployment rate	-
Vulnerable employment	-
Employment to population ratio	+
Annual growth rate of output per worker	+

GOAL 9

Share of medium and high-tech manufacturing value added in total manufacturing value added	+
Individuals using the Internet	+
Fixed Internet broadband subscriptions per 100 inhabitants	+
Research and development expenditure (% of GDP)	+

GOAL 10

GINI Index	-

GOAL 11

Population-weighted exposure to ambient PM 2,5 pollution	-

GOAL 12

Material consumption (tonnes/capita)	+
Material productivity (US dollars/kilogram)	-

GOAL 13

CO_2 emissions (metric tons per capita)	-
CO_2 emissions embodied in imports	-

GOAL 14

Fish caught from overexploited or collapsed stocks	-
Marine protected areas	+

GOAL 15

Terrestrial protected areas	+
Vegetation loss since 1992	-
Proportion of forest area	+

GOAL 16

Intentional homicides	-
Corruption Perception Index	+