International Organisations Research Journal, 2023, vol. 18, no 1, pp. 75–106
Original Article
doi:10.17323/1996-7845-2023-01-03

The BRICS Sustainable Development Index: Findings[1]

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Abstract

This article discusses the results of the study on the formation of the BRICS Sustainable Development Index. The authors describe the methodology of the index, the indicator selection process, and methodological problems and challenges, and also provide a detailed analysis of the dynamics of sustainable development goal (SDG) indicators for BRICS countries (Brazil, Russia, India, China, and South Africa) in 2015–20.

The results of the study indicate both the overall progress of BRICS countries toward SDG implementation and the presence of negative trends in a number of areas and for some countries. For 53 of the 64 indicators selected for the analysis, positive trends were recorded, on average, across BRICS. Nevertheless, the index identified several negative trends across a number of issue areas for individual states and for the group as a whole. These trends include: an increase in the average prevalence of malnutrition, an increase in the number of people in need of treatment for tropical diseases, increasing pressure on water ecosystems in BRICS countries amid a decrease in their area, a decrease in the share of research and development expenditures of gross national product (GDP), and a decline in biodiversity indicators.

Keywords: Sustainable Development Goals (SDGs), 2030 Agenda for Sustainable Development, sustainable development, BRICS

Acknowledgements: the article was written on the basis of the RANEPA state assignment research programme.

For citation: Sakharov A., Dorokhina K. (2023) The BRICS Sustainable Development Index: the Results. *International Organisations Research Journal*, vol. 18, no 1, pp. 75–106 (in English). doi:10.17323/1996-7845-2023-01-03

Introduction

In recent years, the prospects for achieving the United Nations (UN) sustainable development goals (SDGs) have been hampered greatly by the current interlocking economic, geopolitical, energy, and social crises. With the time remaining before the end of the implementation period of the UN Sustainable Development Agenda (Agenda 2030) running out, there is a growing

[1] This article was submitted 28.12.2022.

need to assess the achievements and the prospects of the global community and individual states in the field of sustainable development and to identify specific areas of greatest concern.

The BRICS Sustainable Development Index was designed to meet this challenge. The index was conceived as a mechanism for assessing the progress of the five countries (Brazil, Russia, India, China, and South Africa) in achieving the SDGs in the period of 2015–20. This article highlights the results of the index and present the findings of the study. The methodology of the study and the approaches used by the authors, based on the experience of similar indices and rankings, are covered in detail in the article "BRICS Sustainable Development Index: Methodological Aspects" [Andronova, Sakharov, 2022]. In the present article the authors focus primarily on the results of the study.

The work on the assessment of the implementation of the SDGs remains relevant for all BRICS states in an environment characterized by significant economic constraints caused by interconnected global crises. The need to achieve national development goals and the corresponding SDGs not only persists, but acquires additional urgency. In order to maintain the sustainable functioning of society, it is necessary to strike a balance between short-term goals and the implementation of long-term social and environmental priorities outlined both in the SDGs and in national strategic planning documents. There is also a growing need for intra-BRICS cooperation on tackling the priority sustainable development challenges.

Studying the experience of these countries in overcoming entrenched development problems, developing remote regions, creating quality infrastructure, and introducing new solutions in the sphere of public administration is in line with the focus of Agenda 2030. Adjusting for country specifics, this experience can be taken into account in the implementation of national development goals.

In contrast to similar international comparative studies, this article reflects the national specificities and priority goals of BRICS countries in the field of sustainability and expands the coverage of the UN framework by incorporating additional indicators into the Index, including in issue areas not covered by Agenda 2030.

The article concludes by highlighting the key problems and challenges associated with the implementation of the study's objectives. These include both the substantive issues, inherent to the set of SDGs, and the methodological ones, reflecting the problems in the system for collecting statistical information for BRICS countries. In particular, the absence of important areas such as digitalization and pandemic resilience in Agenda 2030 raises the question of whether it is appropriate to include indicators from new thematic areas that fall outside the scope of the agenda, but which have become more relevant in recent years. New, large-scale trends in global development are shifting national priorities toward addressing emerging challenges in the above areas and their role in achieving sustainable development, making it necessary to understand and correctly reflect these challenges within the framework of this study.

Methodology of the BRICS Sustainable Development Index

Sixty-four indicators were selected for the index, with the primary selection criteria being the availability of data for all BRICS countries for 2015–16 for the "early" year, the availability of data for all BRICS countries for 2017–21 for the "latest available" year, and an indicator that is not an estimate nor implies a binary outcome (that is, yes/no).

In the first phase of the study, the goal was to ensure maximum compliance of the set of selected indicators with the SDG Indicator System and to minimize cases of indicator substitution. In this regard, the distribution of indicators according to the SDGs was also carried out in accordance with the parameters of the approved UN framework. As a result, 49 indicators

were selected directly from the SDG indicator framework [UN, 2016] for all goals except for SDG 4, quality education, and SDG 16, peace and justice. In order to close the data gap for SDG 4, three indicators reflecting the completion rates of primary and secondary education, as well as education expenditures as a share of GDP, were also included in the analysis. At the second stage of the study, additional indicators, reflecting individual areas of implementation of Agenda 2030, were added to the set of indicators from the UN list in order to fill the gaps. Data were collected on 15 additional indicators. The full list of indicators is available in the Appendix.

The collected data on the 64 selected indicators generated two data sets, one for each of the two chronological groups—"2015" and "2020" (the beginning and the end of the monitoring period). The obvious differences in the measurement units of the various SDG indicators, as well as the presence of "negative" indicators (negative values for which actually mean progress toward sustainable development) necessitated the normalization of data to ensure the comparability of results.

Data normalization for each of the two arrays was conducted using the z-score method for the "early" year (2015–16) and the "latest available" year (2017–21), using the formula:

$$z = \frac{x - \bar{X}}{S_x},$$

where x is the indicator value for each BRICS country; $\bar{X}$ is the average value of the indicator of all BRICS countries; S_x is the standard deviation calculated for the set of indicator values of all BRICS countries. The z-score allowed the countries' results for each of the chronological groups to be put to a single scale, with a mean value equal to 0. In the interest of increasing the comprehensibility of the final results, as well as making the results comparable, the normalization procedure for the "negative" indicators was supplemented by changing the sign of such indicators' values ($z^* - 1$). This procedure made it possible to avoid distortions in the average scores for a group of indicators within each SDG for each of the BRICS countries. The resulting values formed static indices of the BRICS countries' sustainable development for the beginning and the end of the monitoring period.

The sustainability progress index, reflecting the dynamics of the SDG indicators in BRICS countries over the period 2015–20 relative to each other, was calculated using a similar formula:

$$z_{\Delta x} = \frac{\Delta x - \overline{\Delta x}}{S_{\Delta x}},$$

where Δx is the difference between the values of the indicator of each of the BRICS countries in the "late" and "early" chronological groups; $\overline{\Delta x}$ is the mean value for Δx of all BRICS countries; $S\Delta x$ is the standard deviation calculated for the set of $\overline{\Delta x}$ values of all BRICS countries. The resulting z-score made it possible to bring the results of the countries' progress to a single scale, with a mean value equal to 0. The formation of the final dynamic progress index was also supplemented by adjusting the values of the "negative" indicators ($Z\Delta x^* - 1$), as was the case with the static indices described above.

Thus, the static indices of BRICS countries for the "early" and "late" stages and the dynamic progress index were formed.

The final stage of the index's development incorporated national priorities of the five countries in the field of sustainable development into the scores. To this end, an expert assessment of the extent to which the selected 64 sustainability indicators were reflected in the BRICS strategic planning documents was carried out based on the analysis of the national strategic planning documents. The assessment was conducted on a three-point scale, where 0 equates to the absence of relevant priority from the system of strategic planning documents, 0.5 implies

partial incorporation of relevant sustainable development priority in national documents, and 1 indicates full incorporation. Full incorporation means that BRICS strategic planning documents contain goals, objectives, and targets on the issues covered by the analyzed element of Agenda 2030. Partial incorporation implies the presence of goals, targets, and indicators on topics related to those affected by Agenda 2030, or which have an indirect impact on the potential change in the SDG indicators under consideration.

If the expert score amounts to 0, 15% of the difference between the highest and lowest index value for a particular indicator was subtracted from the progress index value. If the score is 0.5 the index value remained unchanged. If the score is 1, 15% of the difference between the highest and lowest index value for a particular index was added to the progress index. The 15% value of the modifier was chosen to ensure a moderate impact of subjective assessment on the objective changes in the absolute values of the indicators selected for analysis. On the one hand, a modifier with this value is able to affect the relative positions of countries in the final distribution, but on the other hand, it will not force a defining change for the index value.

Thus, the final index is formed by applying the expert assessment (prioritization) modifier to the progress index. This modifier is designed to link sustainable development indicators with the national agenda of BRICS countries, including in terms of prioritizing the directions of Agenda 2030 for the five countries in recent years and for the foreseeable future.

Given that the majority of the indicators selected for the analysis, are taken account of in the strategic planning documents of BRICS countries at least to some extent, the effect of the modifier is, on average, positive. There are, however, a number of exceptions. This mostly concerns the so-called negative indicators. For example, indicators 3.4.2 "Suicide mortality rate," 3.7.2 "Birth rate among adolescent girls (10–14 years old and 15–19 years old) per 1000 teenage girls," and 3.9.3 "Unintentional poisoning deaths" are practically not reflected in the BRICS documents. For such indicators, application of the modifier led to a drop in final scores.

Data Sources

In the interest of ensuring a clear link between the index and Agenda 2030, the UN's Global Sustainable Development Goals Indicators Database [n.d.] was used as the source base for the study. Forty-eight unique indicators met all three selection criteria:

For SDG 1, poverty eradication, there are four indicators:

1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural);

1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable;

1.4.1 Proportion of population living in households with access to basic services;

1.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population;

For SDG 2, eradicate hunger, there are two indicators:

2.1.1 Prevalence of undernourishment;

2.2.3 Prevalence of anaemia in women aged 15 to 49 years, by pregnancy status (percentage);

For SDG 3, good health and well-being, there are 11 indicators:

3.1.1 Maternal mortality ratio

3.2.1 Under-5 mortality rate

3.2.2 Neonatal mortality rate

3.3.2 Tuberculosis incidence per 100,000 population

3.3.5 Number of people requiring interventions against neglected tropical diseases

3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease

3.4.2 Suicide mortality rate

3.5.2 Alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol

3.6.1 Death rate due to road traffic injuries

3.7.2 Adolescent birth rate (aged 10–14 years; aged 15–19 years) per 1,000 women in that age group

3.8.1 Coverage of essential health services

3.9.3 Mortality rate attributed to unintentional poisoning;

For SDG 4, quality education, there are three indicators:

Primary education completion rate;

Completion rate of complete secondary education;

Share of public spending on education as a share of GDP;

For SDG 5, gender equality, there is one indicator:

5.5.1 Proportion of seats held by women in (a) national parliaments and (b) local governments

For SDG 6, clean water and sanitation, there are five indicators:

6.1.1 Proportion of population using safely managed drinking water services;

6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water;

6.4.1 Change in water-use efficiency over time;

6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources;

6.6.1 Change in the extent of water-related ecosystems over time;

For SDG 7, low-cost and clean energy, there are three indicators:

7.1.1 Proportion of population with access to electricity;

7.2.1 Renewable energy share in the total final energy consumption;

7.3.1 Energy intensity measured in terms of primary energy and GDP;

For SDG 8, decent work and economic growth, there are two indicators:

8.1.1 Annual growth rate of real GDP per capita;

8.2.1 Annual growth rate of real GDP per employed person;

For SDG 9, industrialization, innovations, and infrastructure, there are four indicators:

9.4.1 CO2 emissions per unit of value added;

9.5.1 Research and development expenditure as a proportion of GDP;

9.b.1 Proportion of medium and high-tech industry value added in total value added;

9.c.1 Proportion of population covered by a mobile network, by technology;

For SDG 10, reduction of inequality, there are five indicators:

10.4.1 Labour share of GDP;

10.7.3 Number of people who died or disappeared in the process of migration towards an international destination;

10.7.4 Proportion of the population who are refugees, by country of origin;

10.a.1 Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff;

10.b.1 Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows);

For SDG 11, sustainable cities and human settlements, there are two indicators:

11.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population;

11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted);

For SDG 12, responsible consumption and production, there are two indicators:

12.c.1 Amount of fossil-fuel subsidies per unit of GDP (production and consumption);

12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP;

For SDG 13, combat climate change, there is one indicator:

13.1.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population;

Under SDG 14, conserve marine ecosystems, there is one indicator:

14.1.1 (a) Index of coastal eutrophication; and (b) plastic debris density;

Under SDG 15, conservation of terrestrial ecosystems, there are three indicators:

15.1.1 Forest area as a proportion of total land area;

15.4.1 Coverage by protected areas of important sites for mountain biodiversity;

15.5.1 Red List Index;

For SDG 17, Partnership for Sustainable Development, there is one indicator:

17.1.1 Total government revenue as a percentage of GDP, by source.

Additionally, nine indicators from the UN Educational, Scientific and Cultural Organization (UNESCO) Institute for Statistics Database [n.d.] were used:

1. GDP per capita, PPP;
2. Debt service as percentage of GDP;
3. School life expectancy, pre-primary education
4. School life expectancy, primary education
5. School life expectancy, tertiary education
6. School life expectancy, post-secondary (non-tertiary) (both sexes) (years)
7. Fertility rate, total. births per woman
8. Life expectancy at birth
9. Mortality rate, infant (per 1000 live births)

As well as six indicators from the International Energy Agency database [n.d.]:

1. CO2 emissions per unit of GDP;
2. CO2 emissions per capita;
3. Carbon intensity of final energy consumption;
4. Carbon intensity of energy consumption in industry;
5. Share of low-carbon sources in electricity production;
6. Share of renewable energy sources in electricity generation;

Finally, one indicator from the BRICS 2021 statistical compilation—the share of education expenditures as a share of GDP—was used [BRICS, 2022].

Results of the BRICS Sustainable Development Index

The selection of 64 sustainable development indicators and the collection of statistical information on them for the five BRICS countries resulted in a data set that enables the identification of relative positions of the BRICS countries for 2015 and 2020 and the tracing of their relative progress over this period.

The indicators can be grouped both by individual SDGs and by thematic areas reflecting the main pillars of Agenda 2030—social, economic, and environmental. For the purposes of this article, the results are presented by thematic areas. The relative (in comparison with each other) positions of the BRICS countries are reflected in two static sustainable development indices for each pillar at the beginning and end of the monitoring period. These indices were calculated on the basis of the absolute values of the indicators. The relative (relative to each other) progress achieved by each of the BRICS countries during the monitoring period is reflected in the dynamic progress index, calculated based on the difference between the absolute values of the indicators at the end and beginning of the monitoring period. A 0 on the vertical scale denotes the average BRICS result. Positive values of the index reflect values above the BRICS average, while negative values reflect values below the average.

Figures 1 and 2 reflect the current index scores for 2015 and 2020, as well as the resulting progress index for social indicators. India and China's progress toward achieving the social objectives of the SDGs was the fastest among the BRICS countries in 2015–20. Despite continuing to lag behind the other BRICS countries in absolute terms, India managed to achieve the greatest rate of improvement. For example, the share of people living on less than $1.25 a day fell from 13.6% to 8.4%, the share of people living in households with access to basic services rose from 57% to 71%, and coverage of basic health services increased from 55% to 61% during the monitoring period.

Growth of the absolute index values was also recorded for Russia, with the progress index dropping to slightly below the average level, due to impressive progress made by India and China. On two social block indicators—"The share of the population covered by the minimum level/system of social protection..." and "Fertility rate"—regress was registered for Russia, from 90.4% to 90.1% and from 1.8 to 1.5 children per woman, respectively. In addition, stagnation was observed on two other indicators. "Proportion of the population using safe water services" was recorded at 76%, lower than in Brazil (86%), China (95%), and South Africa (81%). "Life expectancy at birth" remained 71 years, while the other BRICS countries managed to achieve at least some progress over the same period.

The indices for Brazil and South Africa showed a decline due to a period of economic crisis and the degradation of some key indicators. In particular, both countries recorded an increase in the share of the population living below the international poverty line. In Brazil, this indicator increased from 3.2% to 4.6%, and in South Africa from 5.7% to 6.3% between 2015 and 2020. Negative trends were also recorded in health. In particular, the incidence of tuberculosis in Brazil increased during the monitoring period, from 43 to 46 cases per 100,000 people. In South Africa, the neonatal mortality rate increased from 11 to 11.5.

The social targets of BRICS countries have a relatively high level of prioritization in such areas as poverty reduction (SDG 1), health (SDG 3), and education (SDG 4). At the same time, there is a low level of prioritization of gender issues (SDG 5) and of combating inequality (SDG 10) (Fig. 3).

In the environmental sphere, the highest absolute values of the index are observed for Brazil (Fig. 4 and 5). Moreover, the country managed to consolidate its leadership in this area between 2015 and 2020. For example, Brazil, among others, increased the share of renewable energy in total final energy consumption from 43.7% to 47.1%, reduced CO2 emissions per unit of GDP from 0.3 to 0.2 kg. CO2 per USD, and carbon intensity of final energy consumption from 47.9 to 43.2 kg of CO2 per USD.

Nevertheless, it was China that showed the most rapid progress over the five-year period, with the fastest improvements in GDP energy intensity (down from 7.2 to 6.3 MJ per USD), CO2 emissions per unit of value added (down from 0.52 to 0.45 kg CO2 per USD), the share of forested area (up from 22.3% to 23.3%), and protected mountain areas (up from 11% to 11.8%).

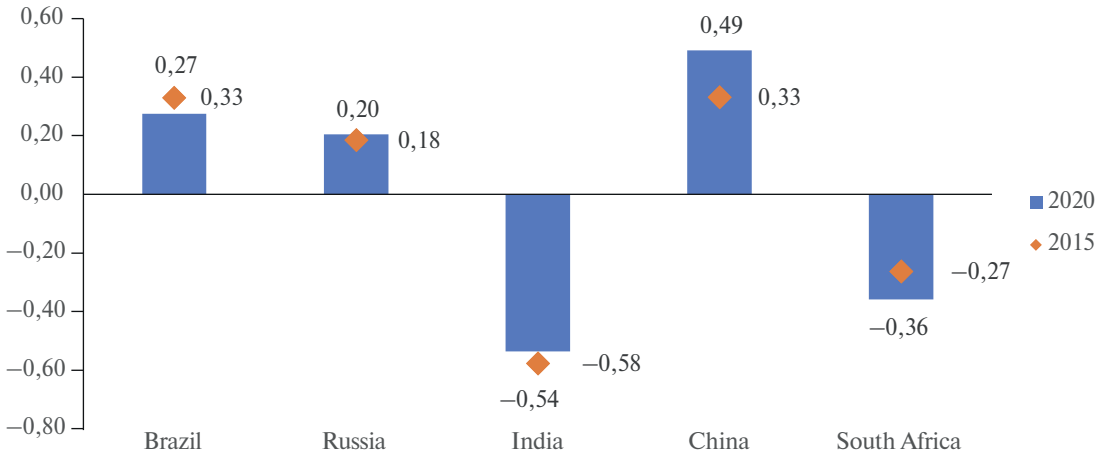

Fig. 1. BRICS Sustainable Development Index at the Beginning and End of the Monitoring Period: Social Sphere

Source: Compiled by the authors.

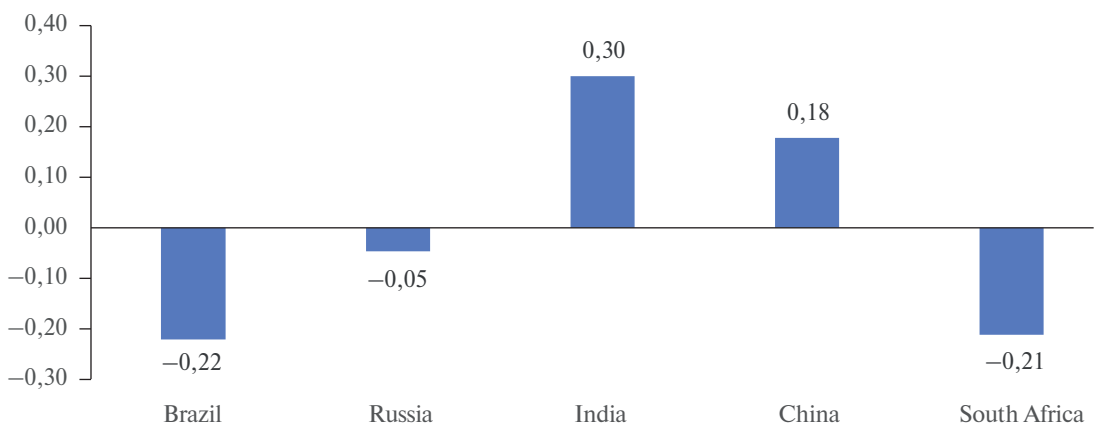

Fig. 2. Progress Index: Social Sphere

Source: Compiled by the authors.

Given Brazil's high performance, Russia's results are below the average on the relative performance distribution scale. In terms of average absolute values of the static index for 2015 Russia was in second place after Brazil. In 2020, Russia fell to third place. The regression of absolute values was observed only for one indicator from the environmental sphere, "the share of renewable energy sources in total final energy consumption," which decreased from 3.2% to 3.18% during the monitoring period.

South Africa showed the worst results in both static and dynamic indices. Regression was observed for seven of the 18 indicators (see Appendix). In particular, the SDG 6 indicators related to the use of water resources showed negative dynamics. The level of pressure on water resources expressed in the freshwater intake as a percentage of available reserves increased from

59.75% to 63.56%. At the same time, the area of water-related ecosystems decreased by 0.6% in 2015 and by 15.4% in 2020.

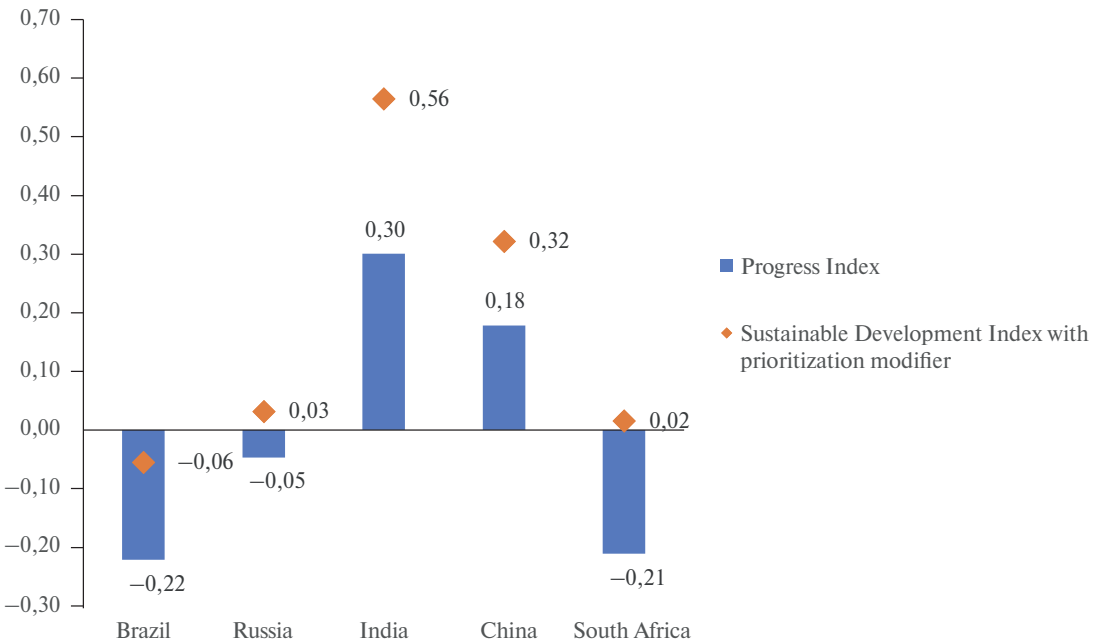

Fig. 3. Aggregate BRICS Sustainable Development Index: Social Sphere

Source: Compiled by the authors.

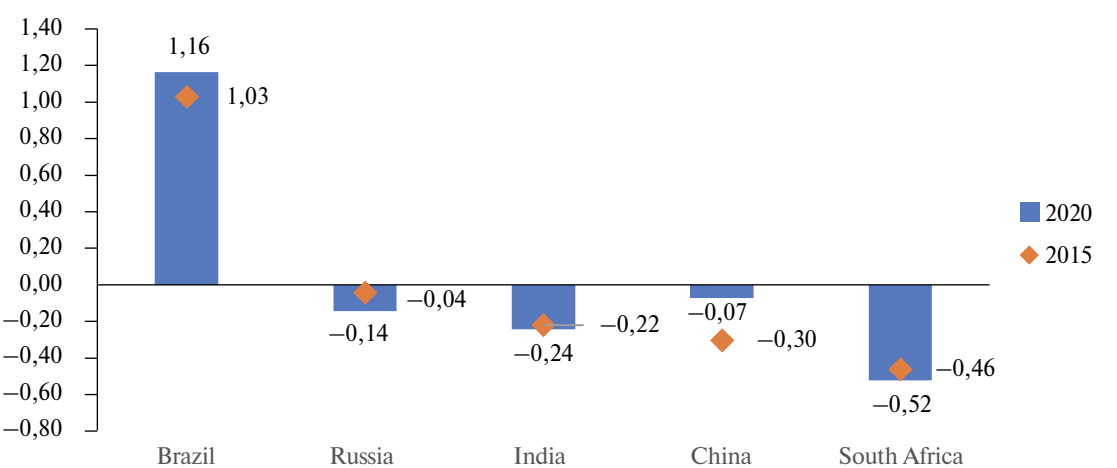

Fig. 4. BRICS Sustainable Development Index at the Beginning and End of the Monitoring Period: Environment

Source: Compiled by the authors.

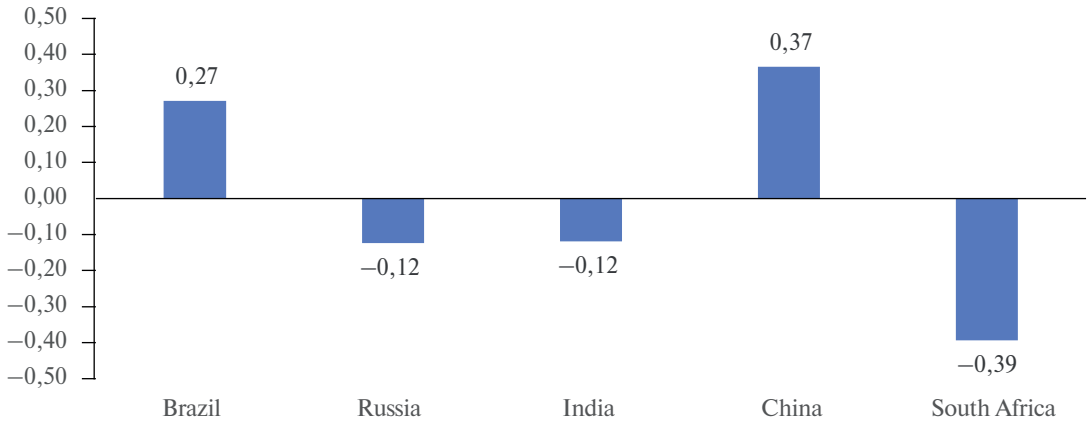

Fig. 5. Progress Index: Environment

Source: Compiled by the authors.

In terms of prioritizing environmental issues in BRICS' national policies, a high level of reflection of sustainability issues in national documents was observed. Notable exceptions include the elimination of fossil fuel subsidies and the fight against the pollution of coastal areas by scrap plastics. Other issue areas, such as the fight against greenhouse gas emissions, energy efficiency, water use efficiency, and ecosystem and biodiversity restoration, were covered extensively with relevant indicators, targets, and objectives in national documents, as well as in international commitments, including the one on the implementation of the Paris Agreement. The overall effect of the prioritization modifier was, thus, positive (Fig. 6).

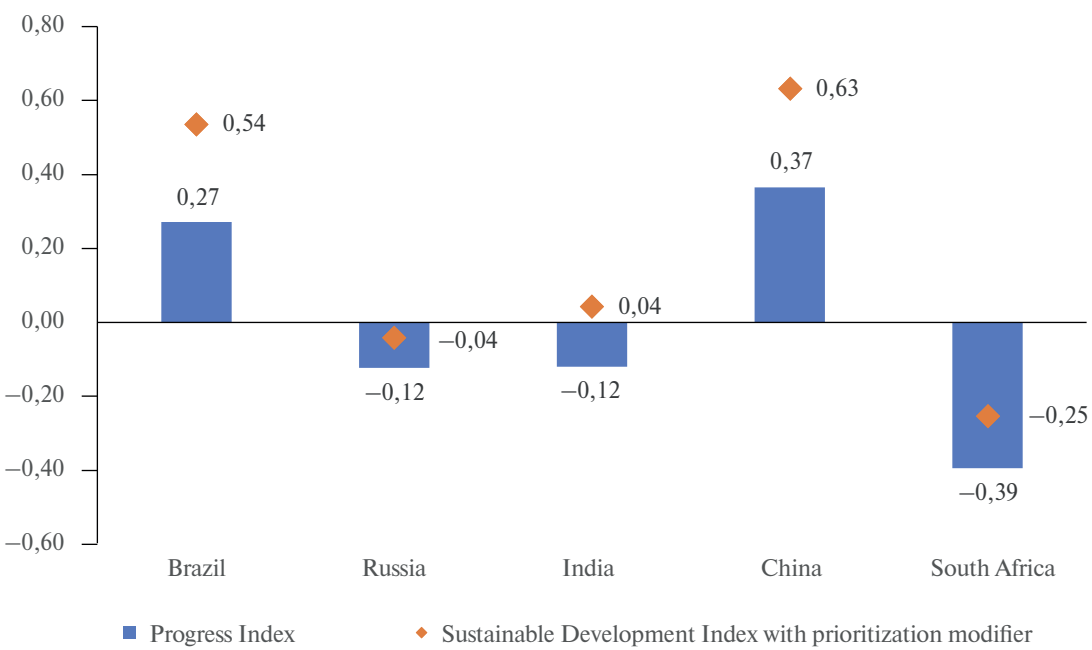

Fig. 6. Aggregate BRICS Sustainable Development Index: Environment

Source: Compiled by the authors.

The significant positive difference between the indicator values in post-crisis 2015 and in 2020 determined Russia's leadership in the progress index on economic issues (Fig. 8). Nevertheless, in absolute terms, China demonstrated the greatest rate of improvement; its GDP per capita indicator rose from $12,612 to $17,603. In addition, the country registered the highest research and development (R&D) expenditure to GDP ratio among BRICS (2.14% in 2020).

Brazil, which experienced a period of economic crisis in 2015–20, suffered the largest drop in the index (Fig. 7 and 8). Negative trends were observed in nine of the 12 indicators (see Appendix).

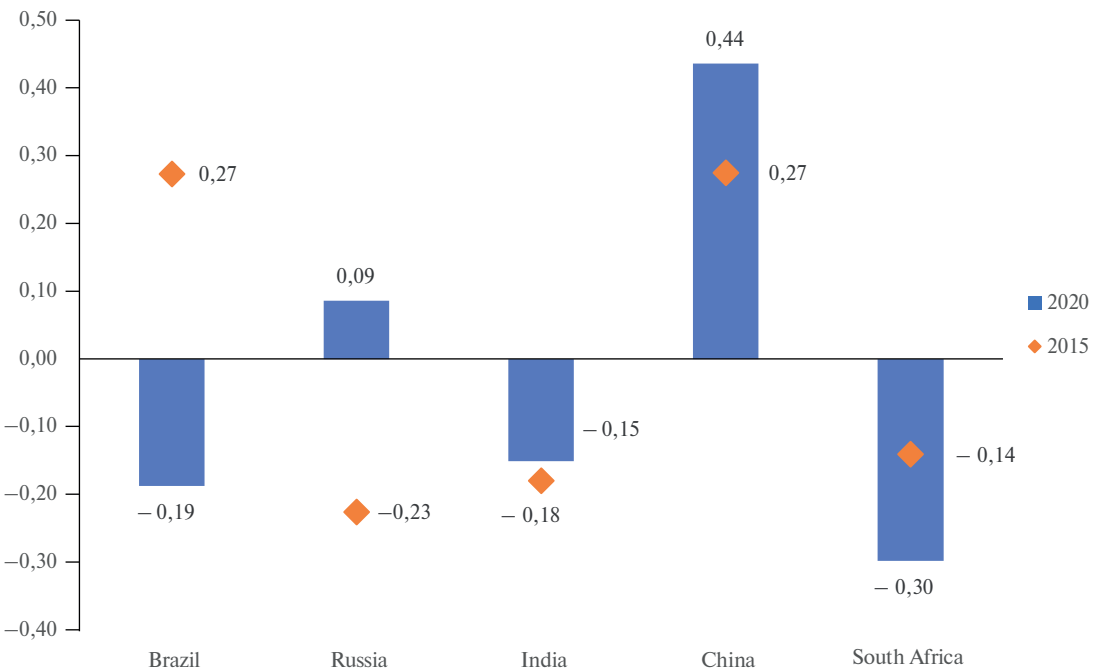

Fig. 7. BRICS Sustainable Development Index at the Beginning and End of the Monitoring Period: Economy.

Source: Compiled by the authors.

The economic aspects of Agenda 2030, which are directly related to the sustainable functioning of national economies, are naturally reflected in the BRICS nations' strategic policy documents. A notable exception in this area is the low incorporation of objectives related to international aid into Russia's national planning documents, for example, SDG 10.a.1 and SDG 10.b.1 (Fig. 9).

Figure 10 shows the final Sustainable Development Index values for the BRICS countries and their relative positions.

Figure 11 demonstrates the distribution of indicators across the SDGs. China made the most significant progress in all key SDG areas in 2015–20, with the highest scores in SDG 6, clean water and sanitation, SDG 10, reducing inequality, and SDG 14, preserving marine ecosystems. India, in second place, has progressed faster than other countries on SDG 1, eradicate

poverty, SDG 4, quality education, and SDG 13, combating climate change. Russia, ranked third, led in SDG 8, decent work and economic growth, and SDG 9, industrialization, innovation, and infrastructure. Brazil scored highest in SDG 2, ending hunger, and SDG 5, gender equality. Finally, South Africa made the most progress on SDG 15, preserving terrestrial ecosystems.

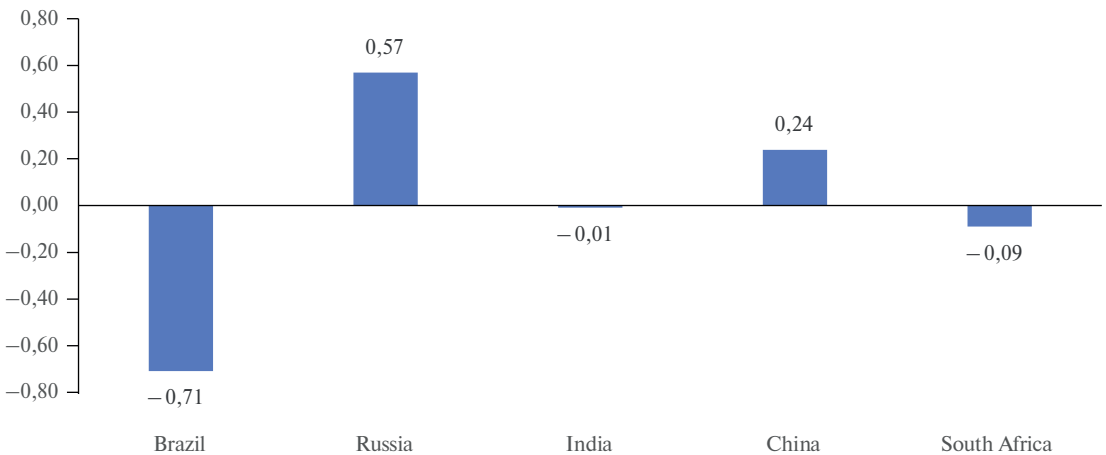

Fig. 8. Progress Index: Economy

Source: Compiled by the authors.

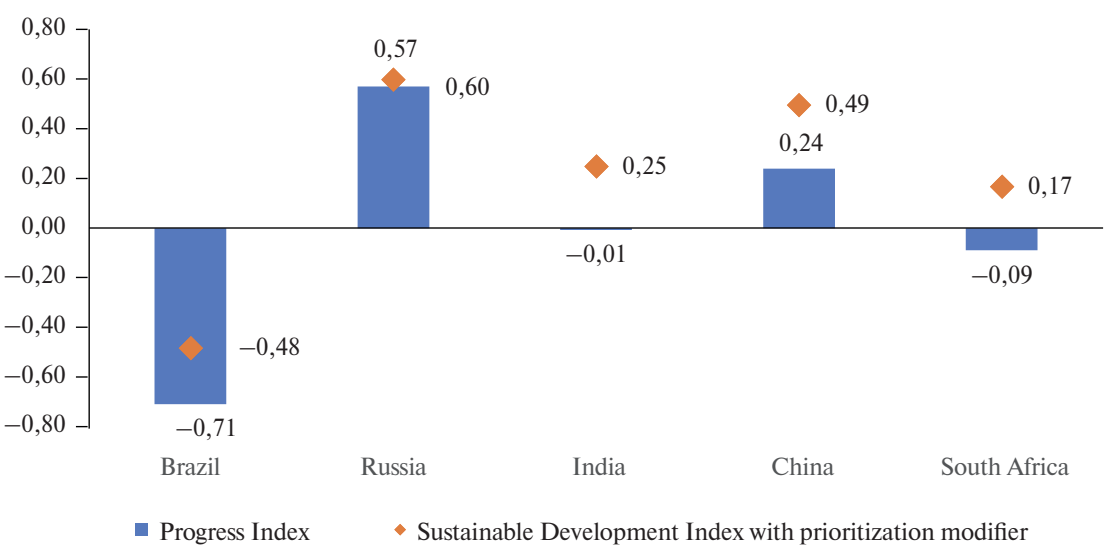

Fig. 9. Aggregate BRICS Sustainable Development Index: Economy

Source: Compiled by the authors.

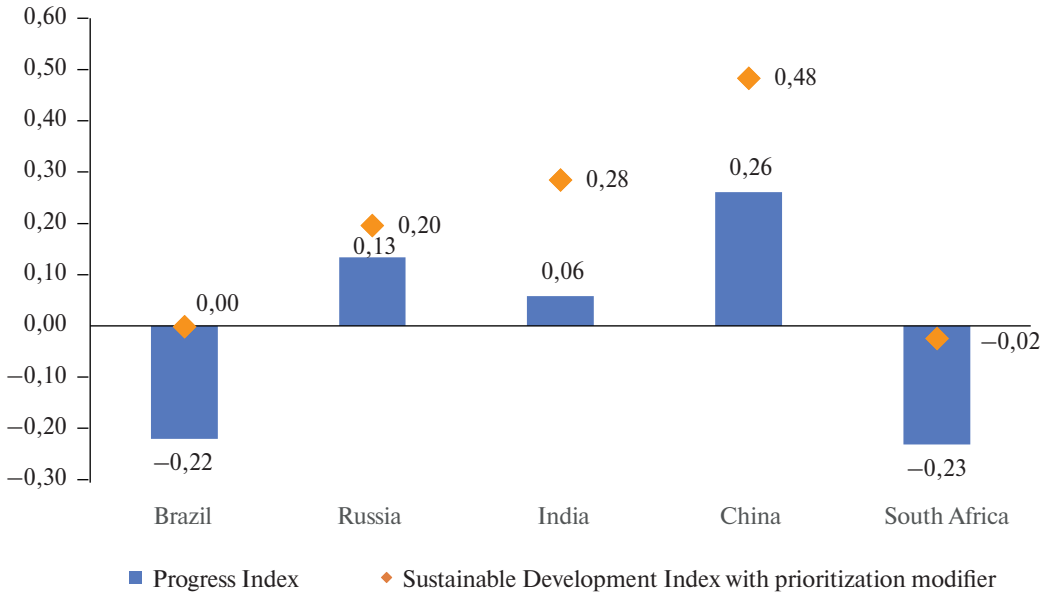

Fig. 10. Aggregate BRICS Sustainable Development Index: All indicators (#64)

Source: Compiled by the authors.

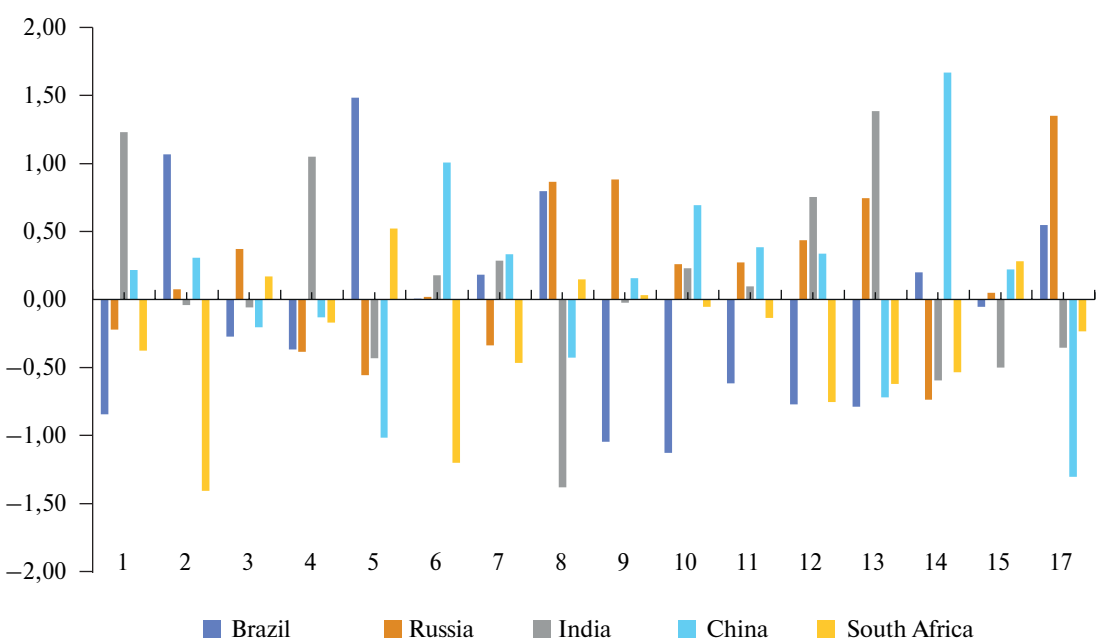

Fig. 11. 2015–2020 Aggregate Progress Index by SDG

Source: Compiled by the authors.

Challenges and Prospects for the Development of the Research Methodology

The authors faced a number of challenges and limitations in the process of forming the BRICS Sustainable Development Index. A key limitation, as for many other similar studies, was the low availability of data on SDG indicators. The study made an effort to ensure the greatest comparability of country data and, therefore, selected only indicators with available relevant data for all BRICS countries. In order to fill data gaps, in particular for goals 4 (education) and 7 (energy), additional indicators not contained in the UN system were introduced.

In addition, while the distribution of indicators across the SDGs was carried out according to the parameters of the UN indicator framework, a number of indicators were repeated for several SDGs. For example, the indicator "Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population" is used under three as SDG 1.5.1, 11.5.1, and 13.1.1 indicators. The grouping of results under the three pillars of Agenda 2030 allows for these indicators to be taken into account only once, within the social area, thus eliminating the issue of double counting.

The time lag in obtaining data for the SDG indicators (ranging on average from one to two years) necessitates the inclusion of more recent BRICS actions that are not reflected in the statistics in the analysis. In this regard, the question of transforming qualitative data on the actions of BRICS countries undertaken in 2020–22 into quantitative indicators and integrating them into the index has been considered. The main problem in this case seems to be the incompatibility of the two data sets. To ensure that the index is linked to the national circumstances, priorities, and actions of BRICS countries, a component for the prioritization of sustainability issues within the BRICS countries' national strategic planning documents was introduced. Thus, at the second stage of the study, an expert assessment of the extent to which the indicators selected for analysis were included in the national strategic planning documents of the five countries was conducted. The strategic documents and actions of the BRICS countries were monitored and, based on the priority of a particular task in the country's national policy, a three-point scale was assigned. At the final stage of the study, expert assessments were integrated as modifiers for the index indicators in order to reflect the place of individual elements of Agenda 2030 in the BRICS countries' system of priorities and prospects for their development in the future.

Another significant challenge is the distortion of the index due to the inclusion of indicators for specific years. For example, 2020 (the last year available for most indicators at the time of the index's formation), for obvious reasons related to the coronavirus pandemic, did not reflect sustainable development trends for BRICS countries in all areas. The short-term impact of individual crises in any given year cannot be ruled out. In this regard, in the course of further work, the possibility of taking into account the averaged values of sustainability indicators over three-year time periods as baseline data for the formation of the index will be considered.

The inclusion of new indicators that reflect current trends in sustainability is also an important area of effort to improve the index. In the future, the index will integrate digitalization indicators, perhaps as modifiers for achieving the SDGs in certain areas. However, determining the specific degree of impact of digital solutions on processes across the entire spectrum of Agenda 2030 remains an unresolved research challenge.

Continued research in the coming years will also ensure the accumulation of data over a longer period of time, allowing for a multi-year comparative analysis of BRICS countries' progress in transitioning to more sustainable growth models.

Conclusion

The results of the study indicate both the overall progress of BRICS countries toward the SDGs, and the presence of negative trends in a number of areas and for a number of countries. Fifty-three of the 64 indicators selected for analysis registered positive dynamics on average across BRICS. Nevertheless, the index identified a number of problem areas for individual states and for BRICS as a whole. These include: a rise in the average prevalence of malnutrition, an increase in the number of people in need of treatment for tropical diseases, increasing pressure on water ecosystems in BRICS countries amid a decrease in their surface area, a decrease in the share of R&D expenditures as a share of GDP, and a decline in biodiversity indicators.

The social block of indicators saw the fastest progress recorded for India and China. An increase in the absolute values of the index was also recorded for Russia, but the progress index was slightly below the average. The results of Brazil and South Africa showed a decline due to the period of economic crisis and degradation of some key indicators.

In the environmental area, the highest absolute scores of the sustainability index were recorded for Brazil, which consolidated its leadership in this area in 2015–20. Nevertheless, China has made the most progress over the five-year period, improving its performance on indicators such as the energy intensity of GDP, emissions per unit of GDP, forested area, and protected mountain areas.

The significant difference between the post-crisis 2015 and 2020 indicators accounted for Russia's lead in the economic progress index. Nevertheless, in absolute terms, China demonstrates the highest rate of progress on the economic indicators under consideration among BRICS countries.

The ranking of countries on the aggregate BRICS Sustainable Development Index, which reflects the relative degree of improvement in sustainability performance between 2015 and 2020, taking into account national priorities, is as follows:

1st place: China: 0.48 points;
2nd place: India: 0.28 points;
3rd place: Russia: 0.20 points;
4th place: Brazil: 0 points;
5th place: South Africa: -0.02 points.

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Appendix

Table 1. Sustainable Development Indicator Values for Brazil (2015–20)

Indicator	Brazil	
	2015	2020
1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)	3,200	4,600
1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable	74,900	69,900
1.4.1 Proportion of population living in households with access to basic services	86,000	90,000
1.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	0,072	0,078
2.1.1 Prevalence of undernourishment	2,500	2,500
2.2.3 Prevalence of anaemia in women aged 15 to 49 years, by pregnancy status (percentage)	16,800	16,100
3.1.1 Maternal mortality ratio	63,000	60,000
3.2.1 Under-5 mortality rate	16,400	13,900
3.2.2 Neonatal mortality rate	9,400	7,900
3.3.2 Tuberculosis incidence per 100,000 population	43,000	46,000
3.3.5 Number of people requiring interventions against neglected tropical diseases	11067291,000	9560959,000
3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease	16,200	15,500
3.4.2 Suicide mortality rate	5,900	6,900
3.5.2 Alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol	7,900	7,321
3.6.1 Death rate due to road traffic injuries	20,800	16,000
3.7.2 Adolescent birth rate (aged 10–14 years; aged 15–19 years) per 1,000 women in that age group	61,700	49,100
3.8.1 Coverage of essential health services	75,000	75,000
3.9.3 Mortality rate attributed to unintentional poisoning	0,200	0,100
4.1.1 Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex	97,000	95,160
4.1.2 Completion rate (primary education, lower secondary education, upper secondary education)	69,710	67,320
Share of public spending on education as a percentage of GDP	5,200	6,200
5.5.1 Proportion of seats held by women in (a) national parliaments and (b) local governments	8,970	15,200
6.1.1 Proportion of population using safely managed drinking water services	82,000	86,000
6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water	44,000	44,000
7.1.1 Proportion of population with access to electricity	100,000	100,000

Indicator	Brazil	
	2015	2020
10.7.3 Number of people who died or disappeared in the process of migration towards an international destination	0,000	0,000
10.7.4 Proportion of the population who are refugees, by country of origin	0,437	0,747
School life expectancy, pre-primary education	1,660	1,730
School life expectancy, primary education	5,400	5,240
School life expectancy, tertiary education	2,230	2,410
School life expectancy, post-secondary (non-tertiary) (both sexes) (years)	0,300	0,280
Fertility rate, total. births per woman	1,800	1,700
Life expectancy at birth	75,000	76,000
Mortality rate, infant (per 1000 live births)	14,000	13,000
6.4.1 Change in water-use efficiency over time	23,210	22,620
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	3,020	3,050
6.6.1 Change in the extent of water-related ecosystems over time	0,571	–2,118
7.2.1 Renewable energy share in the total final energy consumption	43,741	47,062
7.3.1 Energy intensity measured in terms of primary energy and GDP	4,030	3,930
9.4.1 CO2 emission per unit of value added	0,459	0,435
11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	11,771	11,624
CO2 emissions per unit of GDP	0,300	0,200
CO2 emissions per capita	2,200	1,800
Final energy carbon intensity (gCO2/MJ)	47,900	43,200
Carbon intensity of industry energy consumption (gCO2/MJ)	29,200	27,600
Share of low-carbon sources in power generation	76,500	86,300
Share of renewables in power generation	74,000	84,100
12.c.1 Amount of fossil-fuel subsidies per unit of GDP (production and consumption)	0,095	0,119
14.1.1 (a) Index of coastal eutrophication; and (b) plastic debris density	5410680,000	4741,000
15.1.1 Forest area as a proportion of total land area	60,287	59,417
15.4.1 Coverage by protected areas of important sites for mountain biodiversity	48,827	49,895
15.5.1 Red List Index	0,901	0,898
8.1.1 Annual growth rate of real GDP per capita	–4,350	0,380
8.2.1 Annual growth rate of real GDP per employed person	–3,300	–1,100
9.5.1 Research and development expenditure as a proportion of GDP	1,343	1,160
9.b.1 Proportion of medium and high-tech industry value added in total value added	35,460	35,020
9.c.1 Proportion of population covered by a mobile network, by technology	93,530	91,220
10.4.1 Labour share of GDP	61,900	60,400
10.a.1 Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff	56,354	54,962

Indicator	Brazil	
	2015	2020
10.b.1 Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows)	40889,000	10184,000
12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	1,466	1,600
17.1.1 Total government revenue as a proportion of GDP, by source	40,421	42,559
GDP per capita, PPP (2011 USD)	15064,000	14615,000
Debt service as percentage of GDP	5,100	9,300

Sources: Compiled by the authors on the basis of BRICS [2022], IEA [n.d.], UN [n.d.], and UNESCO [n.d.].

Table 2. Sustainable Development Indicator Values for Russia (2015–20)

Indicator	Russia	
	2015	2020
1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)	0,000	0,000
1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable	90,400	90,100
1.4.1 Proportion of population living in households with access to basic services	88,000	89,000
1.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	0,478	0,222
2.1.1 Prevalence of undernourishment	2,500	2,500
2.2.3 Prevalence of anaemia in women aged 15 to 49 years, by pregnancy status (percentage)	20,100	21,100
3.1.1 Maternal mortality ratio	18,000	17,000
3.2.1 Under-5 mortality rate	8,200	5,800
3.2.2 Neonatal mortality rate	3,900	2,600
3.3.2 Tuberculosis incidence per 100,000 population	67,000	50,000
3.3.5 Number of people requiring interventions against neglected tropical diseases	6,000	1,000
3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease	26,400	24,200
3.4.2 Suicide mortality rate	32,000	25,100
3.5.2 Alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol	11,909	10,504
3.6.1 Death rate due to road traffic injuries	17,500	12,000
3.7.2 Adolescent birth rate (aged 10–14 years; aged 15–19 years) per 1,000 women in that age group	24,000	21,500
3.8.1 Coverage of essential health services	71,000	75,000
3.9.3 Mortality rate attributed to unintentional poisoning	4,500	3,800

Indicator	Russia	
	2015	2020
4.1.1 Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex	99,300	99,400
4.1.2 Completion rate (primary education, lower secondary education, upper secondary education)	99,300	99,400
Share of public spending on education as a percentage of GDP	3,800	4,000
5.5.1 Proportion of seats held by women in (a) national parliaments and (b) local governments	13,560	15,780
6.1.1 Proportion of population using safely managed drinking water services	76,000	76,000
6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water	60,000	61,000
7.1.1 Proportion of population with access to electricity	96,000	100,000
10.7.3 Number of people who died or disappeared in the process of migration towards an international destination	0,000	1,000
10.7.4 Proportion of the population who are refugees, by country of origin	46,196	36,111
School life expectancy, pre-primary education	3,410	3,450
School life expectancy, primary education	3,960	4,170
School life expectancy, tertiary education	4,020	4,320
School life expectancy, post-secondary (non-tertiary) (both sexes) (years)	0,040	0,020
Fertility rate, total. births per woman	1,800	1,500
Life expectancy at birth	71,000	71,000
Mortality rate, infant (per 1000 live births)	7,000	4,000
6.4.1 Change in water-use efficiency over time	18,780	19,290
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	3,970	4,040
6.6.1 Change in the extent of water-related ecosystems over time	4,604	7,932
7.2.1 Renewable energy share in the total final energy consumption	3,200	3,181
7.3.1 Energy intensity measured in terms of primary energy and GDP	7,750	8,120
9.4.1 CO2 emission per unit of value added	1,373	1,258
11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	10,511	9,803
CO2 emissions per unit of GDP	1,100	1,100
CO2 emissions per capita	10,600	10,800
Final energy carbon intensity (gCO2/MJ)	80,900	75,100
Carbon intensity of industry energy consumption (gCO2/MJ)	42,900	45,900
Share of low-carbon sources in power generation	15,000	17,600
Share of renewables in power generation	7,000	8,800
12.c.1 Amount of fossil-fuel subsidies per unit of GDP (production and consumption)	2,540	1,660
14.1.1 (a) Index of coastal eutrophication; and (b) plastic debris density	555747,000	681338,000
15.1.1 Forest area as a proportion of total land area	49,761	49,784
15.4.1 Coverage by protected areas of important sites for mountain biodiversity	35,572	35,572

Indicator	Russia	
	2015	2020
15.5.1 Red List Index	0,952	0,952
8.1.1 Annual growth rate of real GDP per capita	–2,170	1,240
8.2.1 Annual growth rate of real GDP per employed person	–1,300	2,500
9.5.1 Research and development expenditure as a proportion of GDP	1,101	0,983
9.b.1 Proportion of medium and high-tech industry value added in total value added	28,560	30,490
9.c.1 Proportion of population covered by a mobile network, by technology	89,000	98,900
10.4.1 Labour share of GDP	51,000	52,000
10.a.1 Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff	60,206	61,976
10.b.1 Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows)	745,000	802,000
12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	1,411	1,441
17.1.1 Total government revenue as a proportion of GDP, by source	37,442	40,841
GDP per capita, PPP (2011 USD)	25488,000	27970,000
Debt service as percentage of GDP	7,800	6,700

Sources: Compiled by the authors on the basis of BRICS [2022], IEA [n.d.], UN [n.d.], and UNESCO [n.d.].

Table 3. Sustainable Development Indicator Values for India (2015–20)

Indicator	India	
	2015	2020
1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)	13,600	8,400
1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable	22,000	24,400
1.4.1 Proportion of population living in households with access to basic services	57,000	71,000
1.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	0,574	0,209
2.1.1 Prevalence of undernourishment	14,700	15,300
2.2.3 Prevalence of anaemia in women aged 15 to 49 years, by pregnancy status (percentage)	52,700	53,000
3.1.1 Maternal mortality ratio	158,000	145,000
3.2.1 Under-5 mortality rate	43,500	34,300
3.2.2 Neonatal mortality rate	25,900	21,700
3.3.2 Tuberculosis incidence per 100,000 population	217,000	193,000

Indicator	India	
	2015	2020
3.3.5 Number of people requiring interventions against neglected tropical diseases	667768672,000	733660997,000
3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease	22,600	21,900
3.4.2 Suicide mortality rate	12,300	12,700
3.5.2 Alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol	5,521	5,605
3.6.1 Death rate due to road traffic injuries	15,600	15,600
3.7.2 Adolescent birth rate (aged 10–14 years; aged 15–19 years) per 1,000 women in that age group	11,100	12,200
3.8.1 Coverage of essential health services	55,000	61,000
3.9.3 Mortality rate attributed to unintentional poisoning	0,300	0,300
4.1.1 Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex	90,900	93,600
4.1.2 Completion rate (primary education, lower secondary education, upper secondary education)	52,100	61,000
Share of public spending on education as a percentage of GDP	3,000	3,500
5.5.1 Proportion of seats held by women in (a) national parliaments and (b) local governments	11,970	14,440
6.1.1 Proportion of population using safely managed drinking water services	51,000	56,000
6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water	67,000	68,000
7.1.1 Proportion of population with access to electricity	88,000	98,000
10.7.3 Number of people who died or disappeared in the process of migration towards an international destination	8,000	9,000
10.7.4 Proportion of the population who are refugees, by country of origin	0,754	0,939
School life expectancy, pre-primary education	1,820	1,830
School life expectancy, primary education	5,430	5,010
School life expectancy, tertiary education	1,340	1,570
School life expectancy, post-secondary (non-tertiary) (both sexes) (years)	0,020	0,110
Fertility rate, total. births per woman	2,300	2,200
Life expectancy at birth	69,000	70,000
Mortality rate, infant (per 1000 live births)	35,000	27,000
6.4.1 Change in water-use efficiency over time	2,450	3,020
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	66,490	66,490
6.6.1 Change in the extent of water-related ecosystems over time	9,476	6,475
7.2.1 Renewable energy share in the total final energy consumption	34,396	31,689
7.3.1 Energy intensity measured in terms of primary energy and GDP	4,890	4,380
9.4.1 CO2 emission per unit of value added	1,487	1,385
11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	67,217	68,755

Indicator	India	
	2015	2020
CO2 emissions per unit of GDP	1,000	0,900
CO2 emissions per capita	1,600	1,700
Final energy carbon intensity (gCO2/MJ)	89,100	87,600
Carbon intensity of industry energy consumption (gCO2/MJ)	59,300	56,400
Share of low-carbon sources in power generation	18,100	22,900
Share of renewables in power generation	15,300	20,000
12.c.1 Amount of fossil-fuel subsidies per unit of GDP (production and consumption)	1,124	0,794
14.1.1 (a) Index of coastal eutrophication; and (b) plastic debris density	883222,000	172809,000
15.1.1 Forest area as a proportion of total land area	23,822	24,270
15.4.1 Coverage by protected areas of important sites for mountain biodiversity	28,070	28,081
15.5.1 Red List Index	0,693	0,671
8.1.1 Annual growth rate of real GDP per capita	6,800	3,180
8.2.1 Annual growth rate of real GDP per employed person	7,100	3,500
9.5.1 Research and development expenditure as a proportion of GDP	0,693	0,653
9.b.1 Proportion of medium and high-tech industry value added in total value added	42,880	41,470
9.c.1 Proportion of population covered by a mobile network, by technology	95,000	99,060
10.4.1 Labour share of GDP	53,400	56,000
10.a.1 Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff	35,139	37,997
10.b.1 Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows)	12274,000	24002,000
12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	3,056	2,834
17.1.1 Total government revenue as a proportion of GDP, by source	12,429	13,153
GDP per capita, PPP (2011 USD)	5464,000	6675,000
Debt service as percentage of GDP	2,400	2,900

Sources: Compiled by the authors on the basis of BRICS [2022], IEA [n.d.], UN [n.d.], and UNESCO [n.d.].

Table 4. Sustainable Development Indicator Values for China (2015–20)

Indicator	China	
	2015	2020
1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)	0,700	0,500
1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable	63,000	70,800
1.4.1 Proportion of population living in households with access to basic services	84,000	92,000
1.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	0,070	0,065
2.1.1 Prevalence of undernourishment	3,000	3,000
2.2.3 Prevalence of anaemia in women aged 15 to 49 years, by pregnancy status (percentage)	14,900	15,500
3.1.1 Maternal mortality ratio	30,000	29,000
3.2.1 Under-5 mortality rate	10,700	7,900
3.2.2 Neonatal mortality rate	5,400	3,900
3.3.2 Tuberculosis incidence per 100,000 population	65,000	58,000
3.3.5 Number of people requiring interventions against neglected tropical diseases	26100630,000	22841,000
3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease	16,800	15,900
3.4.2 Suicide mortality rate	8,100	8,100
3.5.2 Alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol	7,101	6,040
3.6.1 Death rate due to road traffic injuries	18,300	17,400
3.7.2 Adolescent birth rate (aged 10–14 years; aged 15–19 years) per 1,000 women in that age group	9,200	9,300
3.8.1 Coverage of essential health services	76,000	79,000
3.9.3 Mortality rate attributed to unintentional poisoning	2,000	1,800
4.1.1 Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex	94,600	95,600
4.1.2 Completion rate (primary education, lower secondary education, upper secondary education)	55,400	59,300
Share of public spending on education as a percentage of GDP	4,200	4,100
5.5.1 Proportion of seats held by women in (a) national parliaments and (b) local governments	23,620	24,940
6.1.1 Proportion of population using safely managed drinking water services	93,000	95,000
6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water	52,000	70,000
7.1.1 Proportion of population with access to electricity	100,000	100,000
10.7.3 Number of people who died or disappeared in the process of migration towards an international destination	15,000	0,000

Indicator	China	
	2015	2020
10.7.4 Proportion of the population who are refugees, by country of origin	16,202	13,070
School life expectancy, pre-primary education	2,360	2,790
School life expectancy, primary education	5,780	6,250
School life expectancy, tertiary education	2,270	3,150
School life expectancy, post-secondary (non-tertiary) (both sexes) (years)	0,070	0,060
Fertility rate, total. births per woman	1,700	1,700
Life expectancy at birth	76,000	77,000
Mortality rate, infant (per 1000 live births)	8,000	6,000
6.4.1 Change in water-use efficiency over time	18,070	23,540
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	43,200	43,200
6.6.1 Change in the extent of water-related ecosystems over time	7,546	11,996
7.2.1 Renewable energy share in the total final energy consumption	12,245	13,124
7.3.1 Energy intensity measured in terms of primary energy and GDP	7,200	6,300
9.4.1 CO2 emission per unit of value added	0,523	0,449
11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	50,283	45,756
CO2 emissions per unit of GDP	0,800	0,700
CO2 emissions per capita	6,700	7,100
Final energy carbon intensity (gCO2/MJ)	110,700	112,700
Carbon intensity of industry energy consumption (gCO2/MJ)	70,100	64,700
Share of low-carbon sources in power generation	22,500	26,300
Share of renewables in power generation	20,100	22,400
12.c.1 Amount of fossil-fuel subsidies per unit of GDP (production and consumption)	0,218	0,213
14.1.1 (a) Index of coastal eutrophication; and (b) plastic debris density	14219138,000	134588,000
15.1.1 Forest area as a proportion of total land area	22,313	23,341
15.4.1 Coverage by protected areas of important sites for mountain biodiversity	11,005	11,821
15.5.1 Red List Index	0,752	0,735
8.1.1 Annual growth rate of real GDP per capita	6,480	5,650
8.2.1 Annual growth rate of real GDP per employed person	6,900	6,600
9.5.1 Research and development expenditure as a proportion of GDP	2,057	2,141
9.b.1 Proportion of medium and high-tech industry value added in total value added	41,450	41,450
9.c.1 Proportion of population covered by a mobile network, by technology	99,500	99,900
10.4.1 Labour share of GDP	51,600	51,300
10.a.1 Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff	34,597	38,344
10.b.1 Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows)	18063,000	42379,000

Indicator	China	
	2015	2020
12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	3,653	3,464
17.1.1 Total government revenue as a proportion of GDP, by source	28,916	28,148
GDP per capita, PPP (2011 USD)	12612,000	17603,000
Debt service as percentage of GDP	1,200	1,900

Sources: Compiled by the authors on the basis of BRICS [2022], IEA [n.d.], UN [n.d.], and UNESCO [n.d.].

Table 5. Sustainable Development Indicator Values for South Africa (2015–20)

Indicator	South Africa	
	2015	2020
1.1.1 Proportion of the population living below the international poverty line by sex, age, employment status and geographic location (urban/rural)	5,700	6,300
1.3.1 Proportion of population covered by social protection floors/systems, by sex, distinguishing children, unemployed persons, older persons, persons with disabilities, pregnant women, newborns, work-injury victims and the poor and the vulnerable	47,800	49,300
1.4.1 Proportion of population living in households with access to basic services	74,000	78,000
1.5.1 Number of deaths, missing persons and directly affected persons attributed to disasters per 100,000 population	0,559	0,537
2.1.1 Prevalence of undernourishment	5,200	6,500
2.2.3 Prevalence of anaemia in women aged 15 to 49 years, by pregnancy status (percentage)	28,900	30,500
3.1.1 Maternal mortality ratio	125,000	119,000
3.2.1 Under-5 mortality rate	37,100	34,500
3.2.2 Neonatal mortality rate	11,000	11,500
3.3.2 Tuberculosis incidence per 100,000 population	988,000	615,000
3.3.5 Number of people requiring interventions against neglected tropical diseases	6696701,000	18807465,000
3.4.1 Mortality rate attributed to cardiovascular disease, cancer, diabetes or chronic respiratory disease	28,800	24,100
3.4.2 Suicide mortality rate	24,500	23,500
3.5.2 Alcohol per capita consumption (aged 15 years and older) within a calendar year in litres of pure alcohol	9,460	9,451
3.6.1 Death rate due to road traffic injuries	24,100	22,200
3.7.2 Adolescent birth rate (aged 10–14 years; aged 15–19 years) per 1,000 women in that age group	71,100	40,900
3.8.1 Coverage of essential health services	64,000	67,000
3.9.3 Mortality rate attributed to unintentional poisoning	1,900	1,700
4.1.1 Proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex	96,900	98,000

Indicator	South Africa	
	2015	2020
4.1.2 Completion rate (primary education, lower secondary education, upper secondary education)	45,400	47,600
Share of public spending on education as a percentage of GDP	6,900	6,900
5.5.1 Proportion of seats held by women in (a) national parliaments and (b) local governments	41,500	45,840
6.1.1 Proportion of population using safely managed drinking water services	84,000	81,000
6.2.1 Proportion of population using (a) safely managed sanitation services and (b) a hand-washing facility with soap and water	44,000	44,000
7.1.1 Proportion of population with access to electricity	85,000	85,000
10.7.3 Number of people who died or disappeared in the process of migration towards an international destination	3,000	0,000
10.7.4 Proportion of the population who are refugees, by country of origin	0,807	0,833
School life expectancy, pre-primary education	0,770	0,700
School life expectancy, primary education	7,300	6,850
School life expectancy, tertiary education	1,130	1,240
School life expectancy, post-secondary (non-tertiary) (both sexes) (years)	0,340	0,370
Fertility rate, total. births per woman	2,500	2,400
Life expectancy at birth	63,000	64,000
Mortality rate, infant (per 1000 live births)	29,000	26,000
6.4.1 Change in water-use efficiency over time	14,940	14,320
6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources	59,750	63,560
6.6.1 Change in the extent of water-related ecosystems over time	–0,619	–15,397
7.2.1 Renewable energy share in the total final energy consumption	10,292	10,343
7.3.1 Energy intensity measured in terms of primary energy and GDP	7,580	7,700
9.4.1 CO2 emission per unit of value added	1,137	1,062
11.6.2 Annual mean levels of fine particulate matter (e.g. PM2.5 and PM10) in cities (population weighted)	27,106	25,148
CO2 emissions per unit of GDP	1,300	1,300
CO2 emissions per capita	7,600	7,400
Final energy carbon intensity (gCO2/MJ)	151,400	149,900
Carbon intensity of industry energy consumption (gCO2/MJ)	46,600	44,200
Share of low-carbon sources in power generation	7,300	10,400
Share of renewables in power generation	2,400	5,100
12.c.1 Amount of fossil-fuel subsidies per unit of GDP (production and consumption)	0,773	1,334
14.1.1 (a) Index of coastal eutrophication; and (b) plastic debris density	1059365,000	304,000
15.1.1 Forest area as a proportion of total land area	14,205	14,055
15.4.1 Coverage by protected areas of important sites for mountain biodiversity	29,694	31,906
15.5.1 Red List Index	0,785	0,770
8.1.1 Annual growth rate of real GDP per capita	–0,340	–1,160

Indicator	South Africa	
	2015	2020
8.2.1 Annual growth rate of real GDP per employed person	–2,500	0,700
9.5.1 Research and development expenditure as a proportion of GDP	0,798	0,832
9.b.1 Proportion of medium and high-tech industry value added in total value added	24,430	24,430
9.c.1 Proportion of population covered by a mobile network, by technology	99,900	99,970
10.4.1 Labour share of GDP	53,000	54,100
10.a.1 Proportion of tariff lines applied to imports from least developed countries and developing countries with zero-tariff	59,021	60,988
10.b.1 Total resource flows for development, by recipient and donor countries and type of flow (e.g. official development assistance, foreign direct investment and other flows)	6330,000	5239,000
12.2.2 Domestic material consumption, domestic material consumption per capita, and domestic material consumption per GDP	1,521	1,499
17.1.1 Total government revenue as a proportion of GDP, by source	37,766	38,679
GDP per capita, PPP (2011 USD)	14010,000	13126,000
Debt service as percentage of GDP	6,400	8,700

Sources: Compiled by the authors on the basis of BRICS [2022], IEA [n.d.], UN [n.d.], and UNESCO [n.d.].