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Development of a Global SDG Progress Index Aimed at “Leaving No One Behind”

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Abstract: The United Nation’s Sustainable Development Goals (SDGs) constitute a set of shared global objectives for the development over the coming years, which both developed and developing countries are working together to achieve. It is, however, very difficult to know from tracking national-level SDG performance estimates whether steps are being taken to arrive at 2030 with an adequate degree of compliance, and fully delivering on the aim of “leaving no one behind”. This paper proposes and evaluates a Global SDG Progress Index which exploits the reported country rankings for the SDG Index, and incorporates a series of weighting coefficients to effectively involve all countries in improving SDG performance, regardless of their position in the ranking. Thresholds for the index are established to determine the adequacy of progress in relation to the 2030 goals. The results show that the current rate of progress in developing countries (assuming as an indicator GDP per capita values) is insufficient to achieve equitable compliance with the SDGs at the global level.

Keywords: Sustainable Development Goals; monitoring sustainable development; sustainable development indicators; SDG Index; leaving no one behind

1. Introduction and Overview of the Method

1.1. Background

Sustainable Development Goals (SDGs) have made a qualitative leap forwards since the establishment of the Millennium Goals [1]. The differential factor of greatest interest here is probably the inclusion in the evaluation and advancement process of all the world’s countries, not just developing ones. The objectives, targets and indicators highlight not only deficits in development (poverty, water sanitation, access to food) but also issues such as those related to the misuse of resources and the pollution of ecosystems, where more developed countries tend to perform worse.

Each year, a report is published on the degree of compliance with each of the SDGs, using a set of selected indicators, and an overall index for each country, known as the SDG Index, which is scored between 0 and 100 according to a weighting of the indicators for each objective [2]. As shown in Figure 1, there are currently large differences in scores across countries. This annual report allows for a comparison across countries of the progress in achieving the SDGs. It can be seen in the SDG Dashboard [2] how objectives 12, 13 and 14, relating to responsible consumption, climate, and marine ecosystems, appear with very low levels of compliance in OECD member states, while in African countries, compliance is higher (they consume and pollute less), whereas for the first objectives, related to poverty, hunger, and basic health, among others, the results are the reverse.

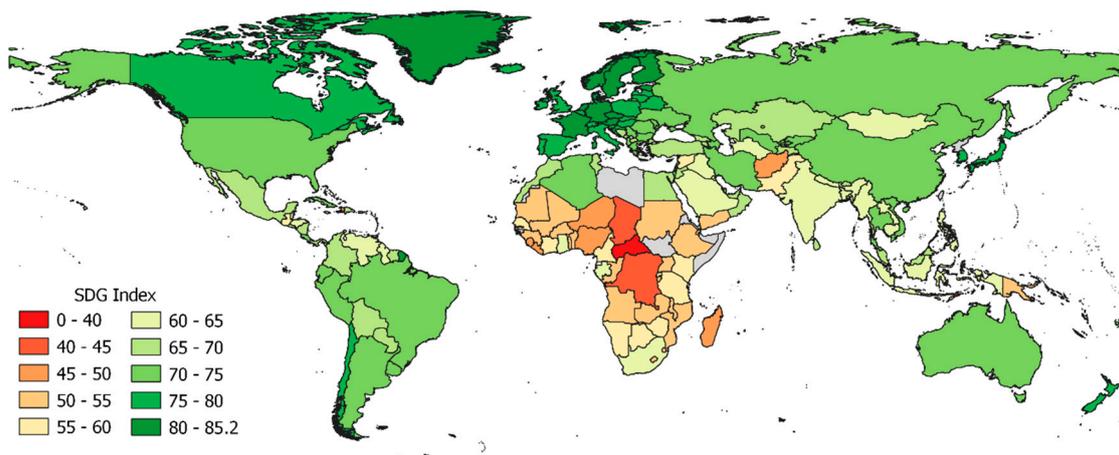


Figure 1. Map of the Sustainable Development Goals (SDG) Index reported for each country in the Sustainable Development Report 2019.

Including indicators where developed countries show their shortcomings is clearly a successful aspect of the initiative, and also puts pressure on developed countries to correct these issues that are clearly of the greatest importance. In addition, this annual review of countries' performance [2] incorporates the concept of spillover, which indicates that the effect on, for example, the ecosystems of developed countries extends further than their borders [3]. This is incorporated into the analyses, although it is probably difficult for a non-specialist reader to understand. It would be desirable for the assessment of these effects beyond the borders of countries to be incorporated into their scores in future versions of the report, so that the SDG Index systematically and effectively penalized negative spillover effects that affect the global pathway towards sustainability [4].

The pressure on developed countries to improve their performance leads to competition in the top part of the SDG Index ranking, and it is simple to find references to the top-performing countries [5]. It is no doubt the case that northern European countries are very satisfied with their positions, and that with SDG Index values above 80, they have undoubtedly laid the foundations for maintaining this situation [6]. France will be proud of its rise to very notable positions, and over time the USA will undoubtedly take steps to occupy positions more in line with its potential [7]. Meanwhile, some countries currently in uncomfortable positions, such as Luxembourg, whose GDP per capita is the largest in the world yet occupies a relatively discrete position, will correct certain policies so as to improve its position.

It is true that the most developed countries have a greater impact on the planet's resources (e.g., according to WWF and Global Footprint Network [8], the EU uses 20% of the Earth's biocapacity although it comprises only 7% of the world population). This is something that is already reflected in the SDGs and which encourages developed countries to improve. All the objectives are relevant, but some, such as 1, 2, 3, 5 and 10, allude directly to human rights, and non-compliance with these leads to deaths and extremely serious situations every day, and it is with these indicators that the countries in the lower part of the classification score worst. Less developed countries score between 40 and 60, according to the SDG Index, and these low scores are more notable in terms of the objectives most associated with people's basic well-being. The 2030 United Nations Agenda incorporates the explicit objective of "leaving no one behind" in the implementation of the SDGs, with an endeavor to reach those furthest behind first. This broad concept includes actions to reduce all forms of inequality, and in general terms promotes the redistribution of wealth. It directly translates into reducing intra-country inequalities [9], but also into ensuring that the goals and targets are met for all nations. The Agenda recognizes the special challenges faced by the most vulnerable countries, thus reaffirming the need to focus on these countries.

Simply looking at the SDG Index ranking is enough to understand that there is a very clear relationship between the position and the level of development or wealth of a country. If one considers the relationship between a country's GDP (average 2017–2019 taken from International Monetary Fund data) and its position in the ranking, the correlation is clear (Figure 2).

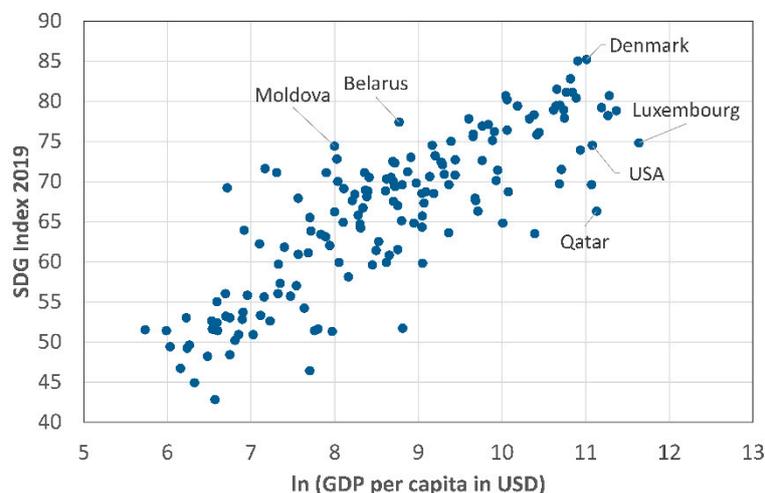


Figure 2. Relationship between the 2019 SDG Index scores and the natural logarithm of GDP per capita (USD) of each country. Countries mentioned in the text are marked with country names in the figure.

There are countries with high incomes and relatively modest ratings (such as Qatar or the USA), and, by contrast, countries with high index values and low-income levels (Moldova or Belarus, for example), but all countries with indices below 60 have a very low GDP, and this is something that should be highlighted when evaluating the evolution of the SDG Index.

The SDG Index is, of course, not the only index that can be used to benchmark the performance of countries across the SDGs. The Human Development Index [10] or the Environmental Performance Index [11] are examples of other composite indicators that cover several goals of the SDGs. The SDG Index has the advantage of incorporating the full set of 17 SDGs, and is also strongly correlated with the above indexes [12]. However, the very design of the SDGs and the weights in the SDG Index does not favor the visibility of the efforts made in poor countries. There are undoubtedly indices focused on global poverty and inequality such as the multidimensional poverty index (MPI) or developments such as World Bank's PovCalNet [13], among others, that allow a much better perception of investment and cooperation needs towards developing countries, but the SDGs have the advantage of being a well-recognized framework [14], which is not discussed at the political level and which has great visibility. The aim of overcoming inequalities in the implementation of SDGs, visible in an index that encompasses them all, is something understandable and recognizable by all decision makers.

1.2. Summary of the Methodology

To end this introduction, an outline of the methodology is presented. First of all, it is important to see if the different countries are moving towards the achievement of the SDGs. To this end, the annual reports on its evolution [2,15–17] have been analyzed in Section 2. Given that there is no aggregation of the data beyond that of each country, it is difficult to perceive at a glance if we are moving forward globally, and if we are doing so in solidarity. That is why in the following chapters (Sections 3 and 4), the evolution of the indices by country is evaluated, and it is verified whether the gap between developed and developing countries tends to close. In order to make this visible, we develop an index that performs a global evaluation of the degree of progress in complying with the SDGs, further weighing the progress in developing countries, so that the index positively values the advances in those countries that have the most way to go. Various index proposals have been analyzed in Section 4,

discussing their advantages and disadvantages, and one of them has been proposed and evaluated in the period available. We also suggest thresholds for the annual values of the index (Section 5) to check if the route toward the SDG is adequate, or improvements and boosting will be required. Finally, the last section draws some conclusions and identifies issues for further research.

2. Evolution of the SDG Index over Time

The SDGs were approved in 2015, and performance reports are available for 2016–2019 [2,15–17]. These are reports of increasing complexity and richness. The first one was a not very long document, while that for 2019 has an extraordinary level of overall analysis for each country evaluated. The number of countries evaluated has also grown: whereas 149 countries figured in the 2016 report, there were 162 countries in the 2019 report, and some of the indicators and analyses have also evolved over the years. This article will deal with all the countries evaluated, in the intervals for which data are available.

Figure 3 shows the increase in the index value for each of the 148 countries analyzed throughout the period 2016–2019 (i.e., countries included in the four consecutive reports), ordered according to the 2019 ranking (number 1 is Denmark, and number 148 is the Central African Republic, which ranked 162nd in 2019). These values are directly based on the raw data of the reports [2,15–17], and are obtained by subtracting SDG Indexes reported in successive reports. Each of the lines indicates the evolution between two consecutive reports (between 2016 and 2017, between 2017 and 2018, and between 2018 and 2019), and their linear trends are given.

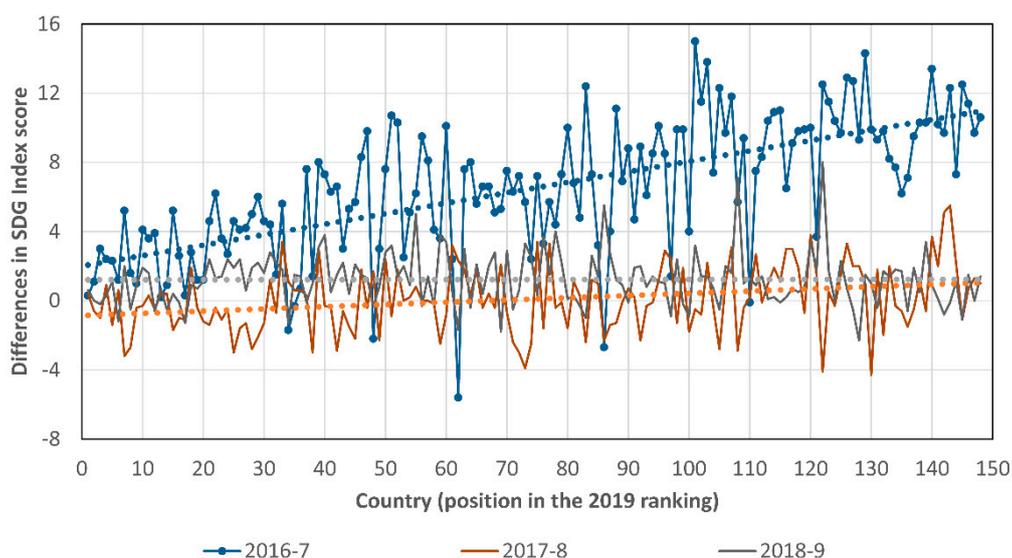


Figure 3. Increases in the SDG Index between one year and the previous one, for the periods 2016–2017, 2017–2018 and 2018–2019, for all the countries analyzed since 2016, ordered according to the 2019 ranking.

It can be seen how between the 2016 and 2017 reports, there is a generalized growth, at an average of 6.5 points. More significant, however, is that the worst positioned countries are those that experience a greater increase, which contributes towards balancing the scores of developed and developing countries. However, as the authors of the study acknowledged in their 2017 report, the 2016 report can only be considered as a draft, and the data on which it was based were not wholly reliable. This increase, therefore, should be seen more as an adjustment of the data than as the result of the efforts of countries to achieve the objectives.

If we analyze the 2017–2018 period, we observe that the increase is very small (almost nil on average), but the less developed countries tend to grow somewhat more than the developed ones, which also points tentatively towards rebalancing.

In the last period (2018–2019), the average increase is slightly higher, but the growth trend is flat: countries grow equally, but very little. There does not seem to be a major impulse from developing countries towards achieving the desired rebalancing in this period.

It is true that three periods of analysis do not constitute a very solid base, and it is also true that the databases for analysis available in the Sustainable Development Reports (<https://sdgindex.org/>) are incomplete, in that not all countries have the data available. Therefore, not all are included in the SDG Index. Furthermore, the reliability of some of the indicators that countries or different entities produce and deliver is questionable (the complete SDG Index methodology can be found in [18]).

In fact, as has been noted, the significant generalized increase between 2016 and 2017 can probably be explained in part by better data contribution in 2017. From that point of view, the 2016–2017 period could be considered an outlier.

3. The Usefulness of Providing a Single Global Index

If we consider that the SDGs should be an engine to stimulate the development of those countries with the most fundamental deficiencies, in the current approach based on the SDG Index score by country and the global ranking, no incentive is given at all, since in an obvious way the rich countries find themselves in the high part of the classification and the poor ones in the low part, and nothing is contributed that was not already known, except if a detailed analysis of all the data of the report is conducted, which is something that very few people will do.

To encourage concrete progress in areas such as development in poor countries or environmental protection, it is perhaps better to target specific indices. For example, Holden et al. [19] proposed a conceptual framework called Sustainable Development Space, where equity, development, and environmental issues are analyzed with specific indices, which allows for knowing the degree of progress in each of these aspects separately. However, what is sought in this work is a direct message oriented to promote equity, which can be at the expense of precision in some aspects, such as environmental protection. That is why an integrated indicator, biased toward equity, is going to be proposed.

It is very difficult to know from reading the annual SDG Index report whether steps are being taken to arrive at 2030 with an adequate degree of compliance, which itself would mean that all countries had made progress and that inequalities in basic issues had been reduced.

The SDGs include in their indicators a lot of quantitative information. Still, it is diluted when globalizing the objectives, and it is difficult to link progress in the SDGs with quantitative thresholds, such as increasing the temperature by 1.5 degrees, as a significant threshold to control climate change. This article will not look for anchors between the SDGs and absolute thresholds, although it is necessary to establish them, but rather will focus on proposing an indicator that clearly shows that the SDGs will not be met if the poorest countries are not supported. Therefore, the explicit threshold values that are proposed in Section 5 are in this sense relative, oriented so that poor countries obtain results that bring them closer to the developed ones.

The best available progress projections across the SDG agenda show that goals will not be met unless more effort is put into their implementation [20]. They also clearly reveal that the level of change needed varies widely across countries, and point to Sub-Saharan Africa as the region in need of greater support. Studies that forecasted progress on individual SDG goals based on past performance, such as that of Crespo et al. [21] for poverty or that of GBD 2017 SDG Collaborators [22] for health, coincided in pointing towards the difficulty of fulfilling the targets and the need for an increased pace of progress. Several national evaluations have pointed in the same direction [23,24].

The SDG Index ranges from 0 to 100, and countries are currently within the 39–85 range (Figure 1), but there is no clear goal to reach globally, and no index to indicate whether or not we are on the right track. In order to fully deliver on the aim of “leaving no one behind”, monitoring should go beyond national-level estimates to be inclusive of both developed and developing nations.

It does not seem credible to arrive at 2030 with 100% compliance with the objectives in all countries. It would be difficult to attain 90% in certain ones, and it would be a truly utopian objective to propose that an average of 90% compliance be achieved. Realistically, the countries that now occupy an intermediate position on the ranking, with scores in the order of 70, have not reached an optimum situation, but in terms of basic questions are far above those countries with fewer resources, for which reaching such a score by 2030 would represent success. An unambitious but possible target might be based on no country falling below 70 points in 2030. This value, which corresponds approximately to the current world median, is certainly an arbitrary figure, but whose compliance imposes a rate of improvement in poverty indicators for developing countries that is much higher than the current one, as can be seen in the following sections. Realistically, it will be difficult to achieve, but it is a relatively affordable goal.

It is important to make the degree of overall progress visible in a single index that incorporates the above considerations. It can contribute to supporting accountability in the implementation of the SDGs but also—and arguably more importantly at this stage—to making visible the gaps in the global progress towards sustainability. Although the reduction to a single number has inherent limitations, it has the advantage of being easy to communicate, and can, therefore, be more effective to stimulate public debate. Such an index should not be the average of the country indices, as this would not be conducive to equity. In fact, the 2019 average, in the order of 66%, does not provide a measure of whether progress has been made towards equity. It might seem easy to go from this 66% to 70% in all countries, yet this is so because there are countries that find themselves very far from that average.

The aim of this article is to propose an index that takes into account overall progress, looking at those countries with lower incomes. It is thus aligned with the objective of achieving equity across regions by implementing the SDGs. This index must show whether the increase in indices in the segment of countries with the lowest degree of development is enough to achieve the objectives at a global level. This approach can contribute to the systematic follow-up of the implementation of the United Nations 2030 Agenda at the global level.

4. Measuring Global SDG Progress

Several methods, relying on a plethora of indicators, can be used to evaluate SDGs performance at the country or regional level [25–27], which has given rise to an ongoing debate on how to measure such performance. Monitoring performance at the global level presents its own challenges that add to this methodological complexity, emanating largely from the shortage of comparable data for tracking progress across countries and over time [28].

The methodology proposed in this paper relies on tracking a representative country-scale metric spanning the 17 SDGs, the SDG Index [2], and exploiting its nearly global coverage and annual updates. This metric is not without limitations [29], but it is well-established and globally consistent, key aspects for the purposes of this work.

Several expressions have been proposed and evaluated for a Global SDG Progress Index (*GSPI*). For further details on the formal process of constructing an indicator, the reader is referred to [30]. The first *GSPI* proposed is the average score increase for the different countries:

$$GSPI_1 = \frac{\sum \Delta(SDGIndex)}{n} \quad (1)$$

where *GSPI* is the global index, and $\Delta(SDGIndex)$ is each country's change (increase or decrease) in the value of the SDG Index. This index, as noted above, provides the overall progress of the SDG Index but does not indicate whether it is the more advanced countries or those in need of more development that are driving progress. Therefore, although it has the advantage of being very simple to understand, it does not seem to be the best overall index.

The second index proposed is:

$$GSPI_2 = \frac{\sum \Delta(SDGIndex) \times Position}{\sum Position} \quad (2)$$

where *Position* is a country's position in the SDG Index ranking, calculated as the average of the positions occupied in the two years on which it is calculated. In 2016, 149 countries were evaluated. This would, in theory, be the total again in 2017, although in fact Cape Verde was evaluated in 2016 but not in 2017, so it is not included. This happens only on a very limited number of occasions.

Weighting scores by position does drive developing countries more, as they tend to occupy the lowest positions in the ranking (with higher numbers). It has the advantage of being an index that can be calculated solely from data linked to the SDG Index, without the need for additional data. To the extent that in the period 2016–2019 countries are being added, there may be some distortion in comparability between years, but once the number of countries has been calculated, this will not be a problem.

If we compare the values of this weighted average ($GSPI_2$) with the simple average ($GSPI_1$) of the increases, we see that the desired rebalancing effect is achieved (Table 1). If Figure 3 is analyzed, it can be seen that in the first period, developing countries grew more than developed ones, and this is evidenced by the increase in the value of the weighted average of 7.86 against a simple average of 6.51. In the 2017–2018 period, there was hardly any growth in the indices, but a slight increase did occur, especially in the countries at the bottom of the ranking. The weighted average gives a value of 0.41, and the simple average one of 0.05, so that the weighted average captures a certain positive character of the data, even though they do not in fact grow on average. Finally, in the period 2018–2019, the countries grew equally, and there were hardly any differences between the two indices.

Table 1. Comparison of all the proposed indices for tracking global progress of SDG performance in the period 2016–2019. GSPI stands for Global SDG Progress Index.

	2016–2017	2017–2018	2018–2019
Average of SDG Index: $GSPI_1$	6.51	0.05	1.24
Position Averaged Index: $GSPI_2$	7.86	0.41	1.28
GDP Averaged Index: $GSPI_3$	8.23	0.93	1.20
GDP, Pop. and Area Aver. Index: $GSPI_4$	8.29	0.98	1.33

However, some observations ought to be made here. With the formula presented ($GSPI_2$), countries such as Luxembourg, which in 2019 occupies position number 34, would have a weighting of 34, and Denmark, which occupies the first position, would have a weighting of 1. Luxembourg's GDP is in the order of twice that of Denmark's, so a better performance ought to be expected, and it may seem unfair to penalize Denmark with a weight of 1, while Luxembourg is given a weight of 34. The richer countries should climb positions and seek to be in the top part of the ranking for questions of prestige, while the global aggregate index should boost those with fewer resources.

Based on the above, a third index is designed to weight countries not according to their position, but according to their GDP per capita, on the understanding that countries with fewer available resources should make greater efforts to achieve the SDGs and that this greater effort should be rewarded in a greater weighting in the indices.

The ratio between the highest GDP per capita and the lowest in all the countries considered is in the order of 400, so that this weighting coefficient is even more incisive than the previous one in terms of the visibility of the efforts and achievements of the countries with fewest resources. The index is expressed as:

$$GSPI_3 = \frac{\sum \Delta(SDGIndex) \times GDPRel}{\sum GDPRel} \quad (3)$$

where GDP_{Rel} indicates the relationship between the maximum GDP per capita (the one corresponding to the country with the greatest value) with respect to the GDP of the analyzed country. This article draws on the latest values published by the International Monetary Fund, given that only 4 years are to be addressed, and there are few variations, but it would be reasonable to work each year with the average GDP of the two consecutive years analyzed. For 2019, the maximum GDP is in the order of 113,000 USD. African countries exceed a weighting value of 200 in many cases (Figure 4). Luxembourg would have a weighting of 1.

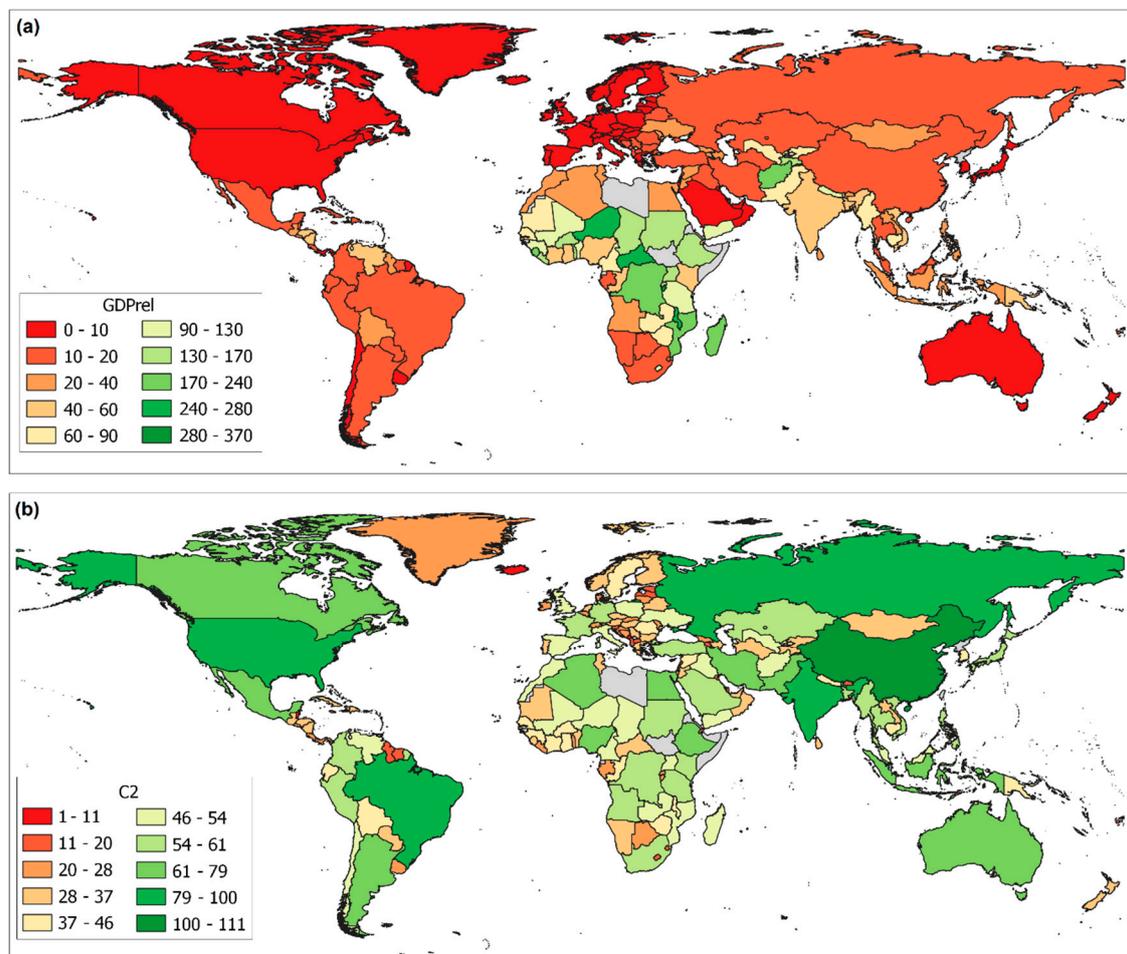


Figure 4. Map of the weighting coefficients based on GDP (a) and on population and area (b) calculated for each country.

One can see in Table 1 how this index best highlights the progress of developing countries, since the years in which these countries grow the most correspond to a higher index value. In fact, the values for 2017–2018 and 2018–2019 are almost balanced, despite average growth in 2017–2018 being almost nil.

Finally, an additional weighting is considered necessary to take into account the relative size of countries. A global index cannot consider a huge country, such as China, in the same way that it does a very small one, like San Marino. Two possible weightings have been considered: one that directly weights the population, and another that weights the product of the population and the surface area, but moderating its effect with a logarithmic function. In this way, the weighting coefficients C_1 and C_2 are:

$$C_1 = Population \quad ; \quad C_2 = \left[\left(\ln \left(\frac{Population}{Pop_{min}} \right) + 1 \right) \times \left(\ln \left(\frac{Area}{Area_{min}} \right) + 1 \right) \right] \quad (4)$$

where *Population* and *Area* are those corresponding to each country, and *Popmin* and *Areamin* are the minima for each of the two concepts. The coefficient C_1 gives a very high weighting to countries with a very high population, which leads to small countries having an almost irrelevant weighting, which goes against the spirit of the UN, where all countries have genuine representation. The formula C_2 would give a weighting of 1 to a country with the minimum population and the minimum surface area (in reality this does not happen). The C_2 coefficient emphasizes large countries but not in a strong way, and hence all countries have some representation (Figure 4). China, the country with the highest coefficient, has a weight of 111.

The proposed fourth global index incorporates this weighting coefficient, as follows:

$$GSPI_4 = \frac{\sum \Delta(SDGIndex) \times GDPRel \times C_2}{\sum GDPRel \times C_2} \quad (5)$$

It can be seen how there are hardly any significant differences between the values given by $GSPI_3$ and by $GSPI_4$. Progress in large and moderately resourced countries leads to higher values every year, which is reasonable and desirable. The $GSPI_4$ index is considered to respond to what is being sought in a reasonable way. As in all the above indices, a $GSPI_4$ of zero corresponds to a situation where SDG index values remain stable over time, although the $GSPI_4$ could reach negative values if the countries saw their SDG Index scores decrease.

5. Are We Progressing Adequately? Proposal for Thresholds

It was noted in Section 3 that it would probably be optimal for all countries to attain a 90% compliance level by 2030, but that it would perhaps be more realistic for all countries to at least exceed 70%, which is the current median.

These figures or this analysis can be considered somewhat arbitrary, and in fact they are, to the extent that the current maximum value of 90% or the current median of 70% are not intrinsically good or acceptable. It is difficult to extract from the $GSPI$ the fulfillment of concrete goals, such as progress in poverty eradication, control of greenhouse gases or progress in equity. However, given the multidimensional nature of the $GSPI$, it is impossible to go from a value of 40 to one of 70 without making significant progress in many of these areas, although it is not possible to guarantee progress in all of them.

The $GSPI$ provides simplicity, it is very easy to interpret by decision makers and it provides encouragement towards an objective, but it is true that a specific objective or goal may not advance at all or even go backwards in a country or in a significant number of countries with good $GSPI$ values. This must be detected in another way. The $GSPI$ is not intended to be the only index, but it is a clear index aimed at promoting international equity.

If 2019 is taken as the initial reference year, attaining 90% in all countries by 2030 would constitute an increase in the $GSPI_4$ of 34.4 points, and ensuring that no country falls below 70 points, assuming that those who have already surpassed this level will neither fall back nor advance, supposes an increase in the $GSPI_4$ of 14.7 points up to 2030. Proposing a target based on the stagnation of half the countries is, however, not acceptable. A reasonable objective could be for all countries to reach 70 points, and for those already above that threshold to advance at least five more points by 2030. This supposes an increase of 15.4 points. There is little difference between this target and the previous one, in that the achievements of developed countries are less appreciable in the global index. This increase must take place over the next 11 years, which means average annual increases of 3, 1.3 and 1.4 points for each of the objectives.

Such annual increases would all have been achieved in 2016–2017, but it is not a reliable year. None would have been met in 2017–2018, and only the most modest in 2018–2019, which is not acceptable because it does not involve the most developed countries.

A classification of the $GSPI_4$ (or directly the $GSPI$ in the following) is proposed to indicate whether the years are positive in terms of the fulfillment of the SDG at a global level (Table 2 and Figure 5):

1. A *GSPI* value below 1.4 is considered insufficient, and marked in red.
2. Values between 1.4 and 1.6 are marked in orange, and are consistent with modest objectives. A value of 1.6 is consistent with an overall increase to 72 points, and an increase of six points in countries that already exceeded that figure today.
3. Values between 1.6 and 1.8 are promising, and marked in yellow.
4. Values above 1.8 are clearly positive, in that they are consistent with a situation in which all countries have surpassed the 75-point threshold, and the most advanced countries have risen eight points compared to 2019.

Table 2. Proposed threshold levels for the *GSPI*. Scenarios consistent with a constant increase in the *GSPI* in each of the ranges.

Level	Limits	Trend-Compatible Scenario	Visualization
Insufficient	$GSPI < 1.4$	None of the minimum objectives set out in the text are met.	
Modest	$1.4 < GSPI < 1.6$	All countries exceed 70 points. The most developed ones increase by 5 points.	
Promising	$1.6 < GSPI < 1.8$	All countries exceed 72 points. The most developed ones increase by 6 points.	
Positive	$GSPI > 1.8$	All countries exceed 75 points. The most developed ones increase by 8 points.	

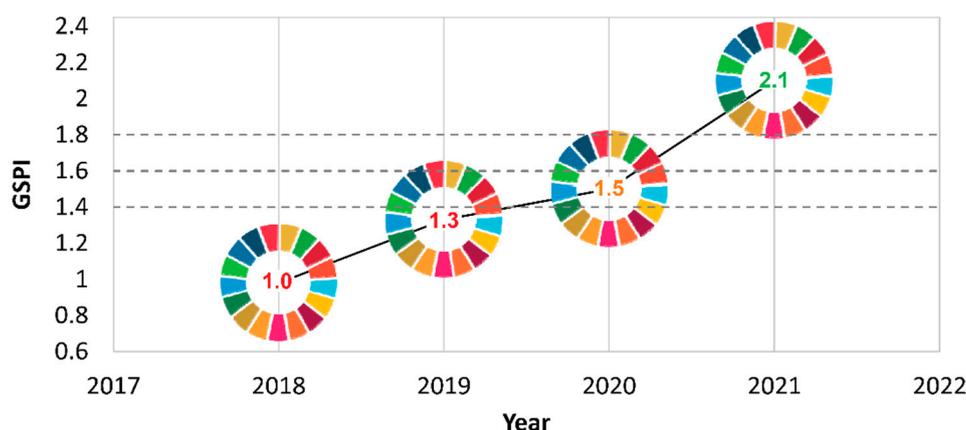


Figure 5. Visualization of the evolution of *GSPI* values over a 4-year period (values for 2020 and 2021 are provided for illustrative purposes and do not reflect expected future values). Numbers are colored according to ranges indicated in Table 2. The SDG colour wheel is used only as a symbol of the SDGs.

A review of the objectives (and perhaps the outlook for the future) could be undertaken every 3 or 4 years, in order to assess the real evolution of the situation and to adapt the indices accordingly. As pointed out by Yonehara et al. [31], the assessment of progress in the 2030 Agenda's central principle of leaving no one behind needs to be introduced in the initial years of the SDG's time frame. The analysis of the 2016–2019 period conducted in this paper suggests that global progress at its present pace will be insufficient to meet the goals.

6. Conclusions, Further Research and Implications

SDGs are an important tool for raising awareness of the need for improvements in most environmental and social spheres, and concern both the most developed countries and developing ones. In contrast to what happened with the Millennium Objectives, SDGs are well known and are on the agendas of the vast majority of countries.

The rankings provided by the SDG Index are an important stimulus for all countries, but especially for the most developed ones, which seek to be in prominent positions as the SDGs become more and

more visible in broader society. However, an index is needed that focuses on developing countries and those with fewer resources, which are the ones who need the most support and at whom many of the SDGs are aimed. It is very difficult to encourage these countries to step up their efforts and to promote international cooperation based on the rankings of the SDG Index, so a Global SDG Progress Index has been proposed that effectively brings together all humanity in the common aim of implementing the SDGs.

Several formulations of the global index have been proposed and evaluated. The one selected as more suitable takes into account the SDG Index and weights it, taking into consideration the wealth of countries, as well as their population and surface area. The *GSPI*, thus calculated, is much more sensitive to improvements in developing countries than in developed ones. The latter will be motivated by their position in the SDG Index ranking to continue improving, as well as being motivated to collaborate with developing countries to achieve a globally positive *GSPI*. An additional motivational element for developed countries would be greater visibility and inclusion in spillover scores, which should directly penalize countries and should be shown more clearly in successive reports.

From the definition of *GSPI*, we can estimate whether progress has been adequate in the years 2017–2019. The rate of progress exceeded the lower threshold (i.e., a rate consistent with modest improvements) only in the period 2018–2019, evidencing that in no case are we on the path towards achieving reasonable and equitable compliance with the SDGs. The visibility of the *GSPI* can serve as a motivating element towards advancing with greater impetus towards these goals. The evaluation of the *GSPI* in the period available demonstrates that a greater impetus is needed to achieve compliance with the SDGs in a harmonious way worldwide. Its monitoring throughout the years, until 2030, can serve as a reference to guide public and cooperation policies.

The *GSPI* is, however, not without limitations. It relies on a composite measure (the SDG Index) covering all 17 goals, and weighting them equally. A poor performance on one goal might thus be concealed by a high performance on another goal. This could potentially be used as a loophole whereby crucial goals that require transformative actions by countries are sidelined by easy-to-achieve goals. In order to provide additional insights on this matter, it would be advisable to complement the evaluation of the SDG Index with analysis at the goal level, as recommended by the EU Joint Research Centre [14].

As future development, it is important to highlight that some indicators and balances included in the SDG Index require in-depth analysis. For example, the imputation of some variables, such as the carbon footprint or water consumption, should be made (at least partially) to the end-user country of the goods and services produced, and not to the country where they are produced. These analyses, and others that involve flows between countries, can and should be analyzed in the future to have a better picture of each country's contribution to compliance with the SDGs.

Last but not least, the adoption or acceptance of this index, or in general of an index that assesses the global compliance with the SDGs promoting the development of the poorest countries, requires a process of negotiation and social action. The publication of this article is nothing but the first step, to be followed by its dissemination and diffusion, towards promoting its underlying concepts, both in the academic or scientific field and, above all, in that of policy-makers.

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Data Availability Statement: The data used in this study are publicly available and can be found online as follows: SDG Index <https://www.sdgindex.org/reports/>, GDP, and Population: International Monetary Fund web (i.e., 2017) <https://www.imf.org/external/pubs/ft/weo/2017/02/weodata/index.aspx>. Surface area: World Bank DataBases <https://data.worldbank.org/indicator/AG.SRF.TOTL.K2>.

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