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Sustainable Development Goals Analysis with Ordered Weighted Average Operators

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Abstract: The present research proposes a new method to analyze the sustainable development goals (SDGs) index using ordered weighted average (OWA) operators. To develop this method, five experts evaluated and designated the relative importance of each of the 17 SDGs defined by the United Nations (UN), and with the use of the OWA and prioritized OWA (POWA) operators, rankings were generated. With the results, it is possible to visualize that the ranking of countries can change depending on the weights related to each SDG because the OWA and POWA operator methods can capture the uncertainty of the phenomenon.

Keywords: sustainable development goals; OWA operator; uncertainty

1. Introduction

One of the earliest definitions of sustainability is attributed to Hicks [1], who stated that sustainability is the maximum income that a person or a nation can consume over some period while retaining as many resources at the end of the period as they had at the beginning. Hicks further argued that income should be calculated to provide a guide as to how much can be consumed annually without becoming impoverished at the end [2]. Later, in 1987, the World Commission on Environment and Development (WCED) popularized the term sustainable development in its report [3]. According to the WCED [4], sustainability is development that meets the needs of the present without compromising the ability of future generations to meet their own needs and requires the simultaneous adoption of environmental, economic and equity principles. Ten years later, [5] showed that many multinationals accept the argument that the three principles of sustainable development are internally consistent [6].

Currently, the term sustainability refers to a tripartite integration of social issues, environmental responsibilities and economic responsibilities [7]. This concept is an increasing concern in the literature on business disciplines [8]. Additionally, companies are rapidly adopting the term sustainability; for example, approximately 68% of the 250 major global companies generate an annual sustainability report [9].

Sustainability requires a holistic approach that is able to address demographic [10], economic [11], agricultural [12], ecological [13] and ethical [14] issues for the correct evaluation of different strategies and policies, distinguishing three hierarchical levels of human activity; i.e., economy, society and the level of ecology or environment [15], with the objective of improving the quality of human life. This approach involves the management and even the transformation of ecosystems [16], taking advantage of their goods and services, reducing the problems caused by their overexploitation [17] and distributing the ecological costs and benefits among the populations involved [18].

The adoption of the SDGs included in the 2030 Agenda for Sustainable Development of the UN encourages countries to align efforts centered on 17 objectives designed to assess
sustainability efforts to reduce world poverty, inequality, injustice and environmental degradation [19]. With less than a decade remaining until the time target objective, the current complex challenges that humanity faces set additional pressure on decision and policy makers to achieve the defined goals [20]. Nonetheless, the wide-ranging topics contained in the SDGs are a necessary call to maintain the availability of current and future generations’ necessities. These results are especially relevant as the world population is approaching eight billion people, and the growth rate and life expectancy are constantly increasing [21].

The 169 targets included in the SDGs act as a shared vision and a plan for the signees to generate actions toward wealth creation and distribution, environmental and human sustainability and inclusivity [22]. These targets are measured according to 231 unique indicators tracked by the UN Statistics Division [23]. There is a clear necessity for these indicators to be relevant, clear and unambiguous [24]; moreover, a solid, integrated and effective indicator framework should convert the SDGs and their corresponding targets into a tool for the assessment of a domestic strategy for the 2030 Agenda participants and the corresponding set of resources allocated for their accomplishment [25].

Correct measurement of the efforts that nations have expended for the achievement of the SDGs is essential to evaluate their progress, along with guiding and amending, if necessary, the corresponding courses of action. The purpose of sustainability assessment and measurement is to provide decision makers with an evaluation of the integrated global and local systems of nature and society from short- and long-term perspectives [26] in order to help them judge what actions should or should not be taken to make society sustainable [27].

Several studies have recently focused on the measurement, monitoring and tracking of these efforts—e.g., in the tracking of early implementations of the SDGs in health-related issues to highlight threats and opportunities [28], the contribution of the motor vehicle and parts industry to the SDGs [29], the application of relational network data envelopment analyses for the quality of education and its relation to the SDGs [30], the measurement and modeling of sustainable well-being towards societal change [31] and a measure of the baseline agriculture-related index for Southern Africa [32].

Even with the continuous contributions to the measurement of the efforts toward achieving the SDGs, some challenges are yet to be considered, mainly in the adopted information fusion mechanism [33]; for example, [34] found that about 60% of the measures set to monitor the progress of the 2030 Agenda for the SDGs were not useful due to the lack of information. The scarce availability of information on key SDG indicators requires the adoption of tools able to assess missing information [35]. Secondly, [36] argues that cultural aesthetic, political institutional and religious/spiritual dimensions have been traditionally excluded from the SDGs due to their intangible or intersubjective nature. Human values, ethics and cosmovision are subjective [35] appreciations that require special treatment for their evaluation. Finally, [37] observed possible pitfalls in the interpretation of progress toward the SDGs, especially when using diverse evaluation methods. Here, a transversal consistent measuring technique is required to correctly assess the meaning and tracking of the actors’ efforts. The OWA operator [38] provides a parameterized family of results between the minimum and maximum values of a series of information. The design of OWA operators has proven to be effective when assessing phenomena in uncertain environments [39,40] or with missing information [41], subjective data [42] or multiple criteria, expectations or attitudes [43]. The characteristic mechanism of OWA operators is, therefore, interesting to consider when assessing the identified challenges of SDG measurement.

The OWA operator is an increasingly applied information fusion technique [44] that has been used in several fields of knowledge, e.g., financial decision making [45], projects [46], innovation management engineering [47] and the categorization of multi-region aggregation information [48]. Some studies applied the OWA operator in the measurement of sustainable efforts, which included measuring water security aligned
to the SDGs [49] and evaluating clean energy alternatives [50], ecotourism development capability [51] and traffic management [52].

The objective of this paper is to evaluate the measurement of sustainability indicators based on the weighted criteria of five sustainability experts. The criteria are centered on the 17 SDGs of the UN. With this information, a new method will be proposed by using aggregation operators. The aim is to provide robust alternatives for the evaluation of sustainability described as a rating, including OWA operators designed to address some of the main challenges seen in the current assessment of SDGs.

The structure of this paper is as follows: Section 2 presents the methodology and the OWA operator. Section 3 presents the SDG analysis with the OWA operators and the results. Finally, Section 4 presents the discussion and results, and Section 5 presents the conclusions.

2. The OWA Operator

The OWA operator introduced by Yager [38] is an aggregation operator that provides a parameterized family of aggregation operators between the minimum and the maximum. It can be defined as follows.

**Definition 1.** An OWA operator of dimension n is an application $F : R^n \rightarrow R$ with a weight vector $w = [w_1, w_2, \ldots, w_n]^T$, where $w_j \in [0, 1]$, $1 \leq i \leq n$ and

$$\sum_{i=1}^{n} w_i = w_1 + w_2 + \ldots + w_n = 1,$$

where

$$F(a_1, a_2, \ldots, a_n) = \sum_{k=1}^{n} w_k b_k,$$

where $b_j$ is the $j$th element largest of the collection $a_1 a_2, \ldots, a_n$.

One of the key aspects of the OWA operator in decision making under uncertain conditions is that it unifies different formulations. Thus, the optimistic criteria, pessimistic (or Wald) criteria, Laplace criteria and Hurwicz criteria are specific cases of the OWA operator. With the OWA operator, the optimistic criteria are found if $w_1 = 1$ and $w_0 = 0$ for all $j \neq 1$; the pessimistic criteria are found if $w_n = 1$ and $w_j = 0$ for all $j \neq n$; the Laplace criteria are found if $w_j = 1/n$ for all $j$; and finally, the Hurwicz criteria are found if $w_1 = \alpha$, $w_n = 1 - \alpha$ and $w_j = 0$ for all $j \neq 0$ for all $j \neq 1, n$.

In group decision making, some of the decision makers are usually regarded as superior to others; therefore, to make a proper decision in this kind of group decision-making situation, we can first construct the prioritization relations among the decision makers and then calculate the overall scores of each alternative using the prioritized aggregation operator [53,54].

A prioritized OWA operator (POWA) is defined as follows.

**Definition 2.** Assume that we have a collection of criteria portioned into $q$ distinct groups, $H_1, H_2, \ldots, H_q$, for which $H_i = (C_{i1}, C_{i2}, \ldots, C_{in})$ denotes the criteria of the $i$th category ($i = 1, \ldots, q$) and $n_i$ is the number of criteria in the class. Furthermore, we have a prioritization between the groups as $H_1 > H_2 > \ldots > H_q$. That is, the criteria in category $H_i$ have a higher priority than those in $H_k$ for all $i < k$ and $i, k \in (1, \ldots, q)$. Denote the total set of criteria as $C = \bigcup_{i=1}^{q} H_i$ and the total number of criteria as $n = \sum_{i=1}^{q} n_i$. Additionally, suppose that $X = (x_1, \ldots, x_m)$ indicates the set of alternatives. For a given alternative $x$, let $C_{ij}(x)$ measure the satisfaction of the $j$th criteria in the $i$th group by the alternative $x \in X$ for each $i = 1, \ldots, q$, $j = 1, \ldots, n_i$. The formula is as follows:

$$C_{(x)} = \sum_{i=1}^{q} \sum_{h=1}^{n_i} w_j C_{ij}(x)$$

(3)
where $w_{ij}$ is the corresponding weight of the $j^{th}$ criteria in the $i^{th}$ category, $i = 1, \ldots, q$, $j = 1, \ldots, i$.

Note that if $w_i = 1/n$ for all $i$, the POWA becomes the prioritized average (PrA).

3. The SDG Analysis with OWA Operators

The Sustainable Development Report focuses on the SDG Index and Dashboards, which provide an annual review of the performance of the 193 UN member countries in working toward the 17 SDGs [55].

Countries are ranked according to their overall score. This score measures a country’s overall progress towards achieving the 17 SDGs. The score can be interpreted as the percentage achievement of the SDGs; a rating of 100 indicates that all SDGs have been achieved.

The index divides the goals according to the degree to which each country has achieved them and assigns each a label of SDG achievement (if the goal was met), challenges remain, significant challenges remain or major challenges remain.

The 17 SDGs are the following: 1. No poverty; 2. Zero hunger; 3. Good health and well-being; 4. Quality education; 5. Gender equality; 6. Clean water and sanitation; 7. Affordable and clean energy; 8. Decent work and economic growth; 9. Industry, innovation and infrastructure; 10. Reduced inequalities; 11. Sustainable cities and communities; 12. Responsible consumption and production; 13. Climate action; 14. Life below water; 15. Life on land; 16. Peace, justice and strong institutions; 17. Partnership for the goals [56].

Achieving the SDGs depends on an effective approach to the implementation and measurement of the actions taken to achieve them, ensuring a continuous dialogue between all entities directly and indirectly involved [56]. To assess some of the identified challenges in the current measurement of the SDGs, the next steps for the implementation analysis are proposed. Please note that even though the SDGs are universal, each entity has its own political, social and natural characteristics that require prioritizing of the goals according to its specific needs. The proposed OWA measuring mechanism allows the inclusion of expert opinions, thus generating an index with relative importance for the chosen items, including the possibility of handling scarce availability of the indicator’s information [33], quantification of intangible or intersubjective issues [34] and interpretation pitfalls that can lead to inconsistencies in measuring the progress of actions.

Step 1. Obtain the weights of each SDG. The process proposed by [57], which is based on personal construction theory (PCT), was used. This process uses an expert (or experts) on the topic to compare the criteria between goals by selecting H if the importance of the criterion is higher than that of the one it is being compared with, S if the importance is the same or L if the importance is lower than that of the one being compared with. Next, the number of H votes that each criterion received was totaled, another column was created with this total plus one, and finally, the weight was obtained by dividing the SDG value in the column that includes the plus one by the total sum of that column. In the case in this paper, five experts were consulted to obtain the weights. These experts are all from Mexico and are currently working (in private or public organizations) in politics, processes or research regarding the SDGs; for informant confidentiality, additional details about their profiles cannot be shared. To visualize the process more clearly, an example with Expert 1 is detailed with the understanding that all other experts followed the same process. Please note that the present analysis seeks to exemplify the proposed mechanism; the inclusion of experts should be extended for a representative analysis of a country’s SDG efforts.

The first step was to obtain a matrix that compares the importance of the criteria see Table 1. Next, the H values were summed. Then, one was added to the column sum, and finally, the weight was obtained by dividing the SDG value in the column that includes the plus one by the total sum of the column see Table 2. The results for each expert are presented in Table 3.
Table 1. Matrix of importance for Expert 1.

| SDG | G1 | G2 | G3 | G4 | G5 | G6 | G7 | G8 | G9 | G10 | G11 | G12 | G13 | G14 | G15 | G16 | G17 |
|-----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|-----|-----|
| G1  | 0  | S  | S  | L  | H  | H  | S  | L  | S  | H   | S   | S   | S   | S   | S   | S   |
| G2  | S  | 0  | S  | S  | S  | H  | H  | S  | H  | H   | H   | H   | H   | H   | H   | H   |
| G3  | S  | S  | 0  | S  | S  | S  | H  | S  | H  | H   | H   | H   | H   | H   | H   | H   |
| G4  | L  | S  | S  | 0  | H  | S  | S  | H  | H  | H   | H   | H   | H   | H   | H   | H   |
| G5  | H  | S  | S  | H  | 0  | H  | H  | H  | H  | H   | L   | L   | L   | H   | L   | H   |
| G6  | H  | H  | S  | S  | H  | 0  | S  | H  | H  | H   | H   | H   | H   | H   | H   | H   |
| G7  | S  | H  | H  | S  | H  | S  | 0  | L  | S  | H   | S   | H   | L   | H   | H   | H   |
| G8  | L  | H  | S  | S  | H  | H  | L  | 0  | S  | H   | H   | H   | H   | H   | H   | H   |
| G9  | S  | S  | H  | H  | L  | H  | S  | S  | 0  | L  | S   | S   | S   | S   | S   | S   |
| G10 | H  | H  | H  | H  | L  | H  | H  | H  | H  | L   | 0   | L   | S   | S   | S   | S   |
| G11 | S  | H  | H  | H  | L  | H  | S  | H  | S  | L   | 0   | S   | L   | L   | L   | L   |
| G12 | S  | H  | H  | H  | L  | H  | H  | H  | S  | S   | S   | 0   | S   | L   | L   | L   |
| G13 | S  | H  | H  | H  | L  | H  | H  | H  | S  | S   | S   | S   | 0   | S   | L   | L   |
| G14 | S  | H  | H  | H  | H  | H  | L  | H  | S  | S   | L   | L   | S   | 0   | H   | L   |
| G15 | S  | H  | H  | H  | L  | H  | H  | H  | S  | S   | S   | L   | L   | L   | H   | 0   |
| G16 | S  | H  | H  | H  | H  | H  | S  | S  | L  | L   | L   | L   | H   | 0   | H   | 0   |
| G17 | S  | H  | H  | H  | L  | H  | H  | H  | S  | S   | L   | L   | L   | L   | L   | H   |

Table 2. Weights for each SDG based on Expert 1.

| SDG | Sum | Sum + 1 | Weight |
|-----|-----|---------|--------|
| G1  | 3   | 4       | 2.68%  |
| G2  | 11  | 12      | 8.05%  |
| G3  | 10  | 11      | 7.38%  |
| G4  | 10  | 11      | 7.38%  |
| G5  | 7   | 8       | 5.37%  |
| G6  | 13  | 14      | 9.40%  |
| G7  | 9   | 10      | 6.71%  |
| G8  | 11  | 12      | 8.05%  |
| G9  | 3   | 4       | 2.68%  |
| G10 | 7   | 8       | 5.37%  |
| G11 | 5   | 6       | 4.03%  |
| G12 | 6   | 7       | 4.70%  |
| G13 | 6   | 7       | 4.70%  |
| G14 | 7   | 8       | 5.37%  |
| G15 | 8   | 9       | 6.04%  |
| G16 | 9   | 10      | 6.71%  |
| G17 | 7   | 8       | 5.37%  |
Table 3. Weights for each SDG based on different experts.

| SDG | Expert 1 | Expert 2 | Expert 3 | Expert 4 | Expert 5 |
|-----|----------|----------|----------|----------|----------|
| G1  | 2.68%    | 6.90%    | 4.84%    | 10.23%   | 18.57%   |
| G2  | 8.05%    | 13.79%   | 8.06%    | 12.50%   | 11.43%   |
| G3  | 7.38%    | 10.34%   | 6.45%    | 12.50%   | 14.77%   |
| G4  | 7.38%    | 11.49%   | 9.68%    | 12.50%   | 14.77%   |
| G5  | 5.37%    | 6.90%    | 3.23%    | 1.14%    | 8.57%    |
| G6  | 9.40%    | 12.64%   | 11.29%   | 12.50%   | 8.57%    |
| G7  | 6.71%    | 9.20%    | 8.06%    | 10.23%   | 10.00%   |
| G8  | 8.05%    | 5.75%    | 4.84%    | 11.36%   | 11.43%   |
| G9  | 2.68%    | 4.60%    | 6.45%    | 11.4%    | 11.43%   |
| G10 | 5.37%    | 5.75%    | 3.23%    | 1.14%    | 4.29%    |
| G11 | 4.03%    | 1.15%    | 11.29%   | 1.14%    | 11.43%   |
| G12 | 4.70%    | 2.30%    | 9.68%    | 1.14%    | 11.43%   |
| G13 | 4.70%    | 2.30%    | 3.23%    | 1.14%    | 1.43%    |
| G14 | 5.37%    | 2.30%    | 3.23%    | 1.14%    | 1.43%    |
| G15 | 6.04%    | 2.30%    | 1.61%    | 1.14%    | 1.43%    |
| G16 | 6.71%    | 1.15%    | 3.23%    | 1.14%    | 1.43%    |
| G17 | 5.37%    | 1.15%    | 1.61%    | 1.14%    | 1.43%    |

For example, G1 had an H when compared with G5, G6 and G1, making its sum 3; G2 had an H when compared with G6, G7, G8, G10, G11, G12, G13, G14, G15, G16 and G17, making its sum 11. Then, 1 was added to the sum, making, in this case, the results for G1 = 4 and G2 = 12. After the results for each SDG were obtained, the total sum was obtained; in this case, it was 149. To obtain the weight for G1, the operation was 4 (the sum of H plus 1) divided by 149 (the total sum of the column sum + 1), then multiplied by 100, making G1 = (4/149) × 100 = 2.68%. In the case of G2, the formula was (12/149) × 100 = 8.05%.

This process was performed for all SDGs.

Table 3 shows the weights assigned by the experts for each SDG. It is important to note that, in general, the opinions are similar in terms of the objectives with the highest importance. The objective with the highest incidence of high importance was number 2, which corresponds to zero hunger; the objective with the second highest importance according to most experts was number 6, which corresponds to clean water and sanitation; and the objective with the third highest importance was 4, quality education. Another objective that was rated with high importance is 3, good health and well-being, followed by SDG number 1, no poverty.

Step 2. To unify the information provided by the different weights of the experts, the POWA operator was used. In this sense, the importance of each expert was determined as $e_1 = 0.15$, $e_2 = 0.20$, $e_3 = 0.20$, $e_4 = 0.30$ and $e_5 = 0.15$. This valuation was made considering the experts’ seniority in SDG-related positions. It is important to note that the weights assigned to each expert can be defined in different ways; in this case, we based them on the experience of each expert and qualifications such as hierarchical position, research impact on the field, number of related projects or the monetary value of the projects that they have completed or supported. There is no limitation on the attributes that can be considered to determine the weights. For this specific case, each expert has the following number of years of work: $e_1 = 6$, $e_2 = 8$, $e_3 = 8$, $e_4 = 12$ and $e_5 = 6$; the sum of all of the years of experience is 40. To obtain the importance weight for Expert 1, the calculation was $6/40 = 0.15$; the same process was performed for all the experts. The experts’ experience was also considered if they worked on the Millennium Development Goals (2000–2015).

Step 3. With the information provided by each expert, it was possible to generate new SDG index scores that consider that all of the SDGs do not have the same importance. This is important because each country has different problems that need to be solved; therefore, it is possible that for public policies, companies and, in general, citizens, there is a priority concerning which of the SDGs need to be solved first. Rather than attempting to
approach all simultaneously, it is important to have a prioritization. Based on this concept, the ranking of countries will change drastically, because the efforts of a country can be aimed toward solving two SDGs rather than all of them. Therefore, different rankings were created based on the weights provided by each expert based on the WA, OWA and POWA operators. It is important to note that the OWA and POWA operators used a maximum criterion. All the results are presented in Appendix A.

To better understand the process for obtaining the results, an explanation for Denmark based on the weights proposed by Expert 1 is presented. In Table 4, the results for the WA are obtained by multiplying the score of each SDG by the weights provided by Expert 1; then, the sum of all the results is the score for Denmark. In the case of the OWA operator, because a maximum criterion is considered, the Score and Weight columns are ordered from highest to lowest; then, each score is multiplied by its weight, and finally, the sum is the score for Denmark see Table 5. Finally, for the POWA operator, the result for Denmark for each expert with the OWA operator is multiplied by its importance and the sum is the score see Table 6.

In Table 7, the countries Sweden, Denmark and Finland remain in the top three according to the opinion of the five experts, only with changes in their positions between first and third place. Position four in the SDG index belongs to France and position five to Germany; however, in the opinion of Expert 1, these countries should be included in the fifth and eighth positions, respectively. For Experts 2, 3, 4 and 5, these two countries should not be included in the top ten. Position seven of the SDG index corresponds to Norway; this country is included in the top ten for Experts 1 and 2, in position six for Expert 1 and in position five for Expert 2. The opinions of Experts 3, 4 and 5 do not include Norway in the ranking. Austria is ranked seventh in the SDG index based on the WA operator. Experts 1, 2, 4 and 5 include this country in the top ten. The Czech Republic is in the eighth position in the ranking, and all five experts include this country in the top ten, although in different positions in the ranking. In the ninth place of the SDG index is the Netherlands, and only Expert 1 considers this country in the top ten rankings. Finally, the SDG index includes Estonia in the tenth position; based on the WA operator, no expert includes it in the ranking. Experts 1, 2 and 3 included Slovenia in the ranking. Experts 2, 3, 4 and 5 included Belgium in the top ten. Other countries considered to be included by Experts 3, 4 and 5 are Hungary and Ireland.

Table 4. Explanation for Denmark with Expert 1 weights with the WA operator.

| SDG | Score | Weight | Score × Weight |
|-----|-------|--------|----------------|
| G1  | 99.58 | 2.68%  | 2.67           |
| G2  | 71.41 | 8.05%  | 5.75           |
| G3  | 94.49 | 7.38%  | 6.97           |
| G4  | 99.10 | 7.38%  | 7.31           |
| G5  | 85.96 | 5.37%  | 4.62           |
| G6  | 90.92 | 9.40%  | 8.55           |
| G7  | 94.21 | 6.71%  | 6.32           |
| G8  | 85.28 | 8.05%  | 6.86           |
| G9  | 96.85 | 2.68%  | 2.60           |
| G10 | 97.55 | 5.37%  | 5.24           |
| G11 | 89.35 | 4.03%  | 3.60           |
| G12 | 42.62 | 4.70%  | 2.00           |
| G13 | 62.52 | 4.70%  | 2.94           |
| G14 | 58.08 | 5.37%  | 3.12           |
| G15 | 92.94 | 6.04%  | 5.61           |
| G16 | 92.76 | 6.71%  | 6.22           |
| G17 | 83.87 | 5.37%  | 4.50           |
|     | Total sum |       | 84.89          |
Table 5. Explanation for Denmark with Expert 1 weights with the OWA operator.

| Score | Weight | Score × Weight |
|-------|--------|----------------|
| 99.58 | 9.40%  | 9.36           |
| 99.10 | 8.05%  | 7.98           |
| 96.85 | 7.38%  | 7.15           |
| 94.49 | 7.38%  | 6.97           |
| 94.21 | 6.71%  | 6.32           |
| 92.94 | 6.71%  | 6.24           |
| 92.76 | 6.04%  | 5.60           |
| 90.92 | 5.37%  | 4.88           |
| 89.35 | 5.37%  | 4.80           |
| 85.96 | 5.37%  | 4.62           |
| 85.28 | 5.37%  | 4.58           |
| 83.87 | 4.70%  | 3.94           |
| 71.41 | 4.70%  | 3.36           |
| 62.52 | 4.03%  | 2.52           |
| 58.08 | 2.68%  | 1.56           |
| 42.62 | 2.68%  | 1.14           |

Total Sum 88.87

Table 6. Explanation for Denmark with the POWA operator.

| Expert | OWA Result | Weight | OWA Result × Weight |
|--------|------------|--------|---------------------|
| e1     | 88.87      | 15%    | 13.33               |
| e2     | 88.78      | 20%    | 17.76               |
| e3     | 91.35      | 20%    | 18.27               |
| e4     | 94.49      | 30%    | 28.35               |
| e5     | 94.20      | 15%    | 14.13               |

Total sum 91.83

Table 7. Top ten ranking based on the WA operator.

| Rank | SDG Index Country | Score | Expert 1 Country | Score | Expert 2 Country | Score | Expert 3 Country | Score | Expert 4 Country | Score | Expert 5 Country | Score |
|------|-------------------|-------|------------------|-------|------------------|-------|------------------|-------|------------------|-------|------------------|-------|
| 1    | Sweden            | 84.72 | Denmark          | 84.89 | Denmark          | 88.43 | Finland          | 79.71 | Denmark          | 89.23 | Finland          | 81.32 |
| 2    | Denmark           | 84.56 | Sweden           | 84.83 | Sweden           | 87.80 | Denmark          | 79.55 | Finland          | 88.75 | Denmark          | 81.11 |
| 3    | Finland           | 83.77 | Finland          | 84.09 | Finland          | 87.65 | Sweden           | 79.27 | Sweden           | 88.14 | Sweden           | 78.67 |
| 4    | France            | 81.13 | Austria          | 81.21 | Belgium          | 85.75 | Belgium          | 76.66 | Germany          | 88.86 | Hungary          | 85.17 |
| 5    | Germany           | 80.77 | France           | 81.06 | Norway           | 85.62 | Japan            | 77.17 | Austria          | 86.26 | United Kingdom   | 77.56 |
| 6    | Norway            | 80.76 | Norway           | 80.94 | Austria          | 85.21 | Slovenia         | 76.66 | United Kingdom   | 85.37 | Canada           | 77.16 |
| 7    | Austria           | 80.70 | Slovenia         | 80.94 | Czech Republic   | 85.19 | Canada           | 76.54 | Czech Republic   | 85.11 | Austria          | 77.14 |
| 8    | Czech Republic    | 80.58 | Germany          | 80.91 | Slovenia         | 85.19 | Hungary          | 76.51 | Belgium          | 84.82 | Czech Republic   | 76.69 |
| 9    | Netherlands       | 80.37 | Czech Republic   | 80.85 | United Kingdom   | 84.71 | Ireland          | 76.48 | Hungary          | 84.21 | Ireland          | 75.61 |
| 10   | Estonia           | 80.06 | Netherlands      | 80.76 | Japan            | 84.59 | Czech Republic   | 76.27 | Italy            | 83.64 | Romania          | 76.16 |

In the comparison in Table 8, Sweden, Denmark and Finland are in the top 3 of both rankings. However, according to the WA operator, the countries that enter the ranking that are not included in the SDG index are Belgium, Slovenia, Ireland, Hungary and the United Kingdom. The scores of both rankings are very similar, and the variations are small. According to the WA operator, France, Germany, Norway, the Netherlands and Estonia are countries that are not included in the ranking.
Table 8. Top ten ranking: Comparison of SDG Index and the WA operator.

| Rank | SDG Index | WA |
|------|-----------|----|
|      | Country   | Score | Country   | Score |
| 1    | Sweden    | 84.72 | Denmark   | 84.64 |
| 2    | Denmark   | 84.56 | Finland   | 84.30 |
| 3    | Finland   | 83.77 | Sweden    | 83.74 |
| 4    | France    | 81.13 | Czech Republic | 80.82 |
| 5    | Germany   | 80.77 | Austria   | 82.45 |
| 6    | Norway    | 80.76 | Belgium   | 81.44 |
| 7    | Austria   | 80.70 | Slovenia  | 80.93 |
| 8    | Czech Republic | 80.58 | Ireland   | 79.66 |
| 9    | Netherlands | 80.37 | Hungary   | 79.37 |
| 10   | Estonia   | 80.06 | United Kingdom | 75.04 |

Table 9 shows a greater number of countries that are included in the SDG Index and in the OWA operator for the five experts. This is the case for Sweden, Denmark, Finland, Norway, Austria and the Netherlands, which have similarities in the ranking between the SDG Index and the OWA operator of the five experts. However, France is only included in the OWA operator of the opinions of Experts 1, 3 and 5. Germany is included in the ranking of Experts 1 and 3. The Czech Republic is only in the ranking of the OWA operator of Expert 1, while Estonia is not included in any OWA operator of the experts. According to the five experts, Switzerland is included in the top ten. Slovenia is in the OWA operator ranking of Experts 2, 3, 4 and 5.

Table 9. Top ten ranking based on the OWA operator.

| Rank | SDG Index | Expert 1 | Expert 2 | Expert 3 | Expert 4 | Expert 5 |
|------|-----------|----------|----------|----------|----------|----------|
|      | Country   | Score    | Country  | Score    | Country  | Score    | Country  | Score    | Country  | Score |
| 1    | Sweden    | 84.72    | Denmark  | 88.87    | Sweden   | 88.82    | Norway   | 91.37    | Norway   | 94.90  |
| 2    | Denmark   | 84.56    | Sweden   | 88.83    | Denmark  | 88.78    | Denmark  | 91.35    | Denmark  | 94.87  |
| 3    | Finland   | 83.77    | Denmark  | 88.78    | Finland  | 90.59    | Denmark  | 94.49    | Denmark  | 94.20  |
| 4    | France    | 81.13    | Norway   | 86.70    | Finland  | 88.18    | Norway   | 90.22    | Finland  | 94.29  |
| 5    | Germany   | 80.77    | Norway   | 86.29    | Switzerland | 88.26   | Switzerland | 93.75   | Switzerland | 93.22  |
| 6    | Norway    | 80.76    | Austria  | 85.13    | Netherlands | 86.14  | Switzerland | 92.79   | Netherlands | 92.44  |
| 7    | Austria   | 80.70    | Germany  | 84.88    | Austria   | 85.85    | Austria  | 88.10    | Netherlands | 92.75  |
| 8    | Czech Republic | 80.58 | France  | 84.71    | Slovenia  | 85.79    | Slovenia  | 87.85    | Slovenia  | 92.48  |
| 9    | Netherlands | 80.37   | Czech Republic | 84.63 | Iceland  | 85.72    | Germany   | 87.52    | Austria   | 92.20  |
| 10   | Estonia   | 80.06    | Switzerland | 84.59 | New Zealand | 85.16  | France    | 87.46    | United Kingdom | 91.83  |

Table 10 shows that the OWA operator scores are higher than those in the SDG Index. In this comparative table, the results are the same for the top 3 of both rankings, with Sweden in first place, followed by Denmark and Finland, and both rankings also include France, Germany and Norway in different positions in the ranking, while Austria is in 7th place in both rankings. The OWA operator does not include the Czech Republic and Estonia, but does include Switzerland and Slovenia.
Table 10. Top ten ranking comparison of the SDG Index and the OWA operator.

| Rank | SDG Index Country | Score | OWA Country | Score |
|------|------------------|-------|-------------|-------|
| 1    | Sweden           | 84.72 | Sweden      | 91.68 |
| 2    | Denmark          | 84.56 | Denmark     | 91.53 |
| 3    | Finland          | 83.77 | Finland     | 90.96 |
| 4    | France           | 81.13 | Norway      | 90.87 |
| 5    | Germany          | 80.77 | Switzerland | 89.22 |
| 6    | Norway           | 80.76 | Netherlands | 88.95 |
| 7    | Austria          | 80.70 | Austria     | 88.62 |
| 8    | Czech Republic   | 80.58 | Slovenia    | 87.22 |
| 9    | Netherlands      | 80.37 | France      | 87.02 |
| 10   | Estonia          | 80.06 | Germany     | 86.20 |

Table 11 shows that Sweden and Denmark remain in the same rank as in the SDG index. The countries that remain in the top ten but in a different rank are Norway, Finland, France, Austria and the Netherlands. The countries that should enter the top ten according to the POWA are Switzerland, Slovenia and Iceland, displacing Germany, the Czech Republic and Estonia.

Table 11. Top ten ranking based on the POWA operator.

| Rank | SDG Index Country | Score | POWA Country | Score |
|------|------------------|-------|-------------|-------|
| 1    | Sweden           | 84.72 | Sweden      | 92.00 |
| 2    | Denmark          | 84.56 | Denmark     | 91.83 |
| 3    | Finland          | 83.77 | Norway      | 91.31 |
| 4    | France           | 81.13 | Finland     | 88.38 |
| 5    | Germany          | 80.77 | Switzerland | 88.36 |
| 6    | Norway           | 80.76 | Netherlands | 91.31 |
| 7    | Austria          | 80.70 | Slovenia    | 89.00 |
| 8    | Czech Republic   | 80.58 | Austria     | 88.33 |
| 9    | Netherlands      | 80.37 | Iceland     | 89.35 |
| 10   | Estonia          | 80.06 | France      | 88.16 |

4. Discussion and Results

The objective of sustainable development is to improve the quality of human life, which may involve the management and even the transformation of ecosystems, taking advantage of their goods and services, reducing the problems caused by their overexploitation and distributing the ecological costs and benefits among the populations involved. The concept of sustainable development does not assume the conservation of nature in its original state as its sole objective, but rather indicates the application of a development model that minimizes the degradation or destruction of the ecological base of production and habitability and allows the development of future generations [58].

Globally, the issue of sustainability is important to the extent of measuring the sustainability of each country based on the 17 sustainable development goals, which currently include new areas such as climate change, economic inequality, innovation, sustainable consumption and peace. These goals serve as a guide that will allow countries to identify whether their social, economic and environmental impact brings value to society, consequently strengthening their reputation and relationships with different stakeholders [59]. Therefore, in this work, an analysis is applied with the purpose of presenting a method of measuring the SDGs in a more flexible manner according to the vision of experts in sustainability, thus allowing a closer approach to the current sustainable reality of the country of origin of the experts. The present study was conducted with the OWA operator introduced by Yager [38], which is an aggregation operator that provides a parameterized family of aggregation operators between the minimum and the maximum. One of the
key aspects of the OWA operator in decision making under uncertainty is that it unifies different formulations. Thus, the optimistic, pessimistic (or Wald), Laplace and Hurwicz criteria are specific cases of the OWA operator. We obtained weights assigned to each SDG by using the process proposed by [57], i.e., PCT. This process uses an expert (or experts) on the topic to compare the criteria between goals by selecting H if the importance of a criterion is higher than that of the criteria it is being compared with, S if the importance is the same or L if the importance is lower than that of the criteria it is being compared with. This study also shows the results obtained from the weighted opinions of five Mexican experts in the area of sustainability in terms of measuring progress toward the 17 sustainability objectives.

This approach allows comparisons to be made between the results of the countries with the best qualifications according to the index of the Sustainable Development Report and the results obtained from the weights given to the sustainability objectives by the Mexican experts. The methodology used allows for evaluation of the prioritized importance among the experts. From these results, it is possible to evaluate sustainability, allowing comparisons between the results obtained from the experts and the Sustainable Development Report. Thus, with the use of the aggregation operators, a new order of priority can be given to the objectives of sustainability, with the purpose of replicating this study in any country, based on the weighted opinions of sustainability experts, to identify the order of priority of the 17 objectives of sustainable development according to the characteristics and needs of each country.

The main results that were observed are that the OWA operator shows different countries than those included in the ranking. For example, countries such as Sweden, Denmark, Finland, Norway, Austria and the Netherlands remain similar even when different aggregation operators are used. Conversely, there are many countries that can be included or not included in the ranking if the results of the aggregation operators are included. For example, France is included in the OWA operator ranking in the opinion of Experts 1, 3 and 5. Germany is included in the ranking of Experts 1 and 3. The Czech Republic is only in the ranking of the OWA operator of Expert 1, while Estonia is not included in any experts’ OWA operator ranking. According to the five experts, Switzerland should be included in the top ten. Slovenia is in the OWA operator ranking of Experts 2, 3, 4 and 5. The main results with the POWA operator show that Sweden and Denmark remain at the same ranking as in the SDG index. The countries that remain in the top ten but in a different ranking are Norway, Finland, France, Austria and the Netherlands. The countries that should enter the top ten according to the POWA operator are Switzerland, Slovenia and Iceland, displacing Germany, the Czech Republic and Estonia.

The main idea is that by using the same data but with different relative importance of each SDG, alternative results can be obtained. These new results are important because, based on the country, not all SDGs have the same importance for a government. As resources are limited, a government will apply resources to the SDG that they are trying to improve, but not all of them, which is why the assumption that the importance of each SDG is equal for all countries is not always the best interpretation of a country’s actions and results. For example, the experts that were considered in this paper were all from Mexico, and their most important SDGs are zero hunger and clean water and sanitation because these are important problems in Mexico. Therefore, the government policies should place their efforts in improving those SDGs, but this situation may or may not be the same for another country; therefore, their efforts will be focused on another SDG.

For this reason, the OWA operator and its extensions are important tools to consider when analyzing data with different relative importance levels. Based on a weighting vector and a reordering step, different results can be obtained, even with the same data. As a good decision-making process considers a number of alternatives, these methodologies are a good way to improve the understanding and broaden the vision of the problem to be analyzed.

This methodology has some limitations that are important to note. The first concerns the weighting vector that is used to obtain the results. The weighting vector is obtained through the information provided by the experts or decision maker; therefore, if different
experts are considered, then different weighting vectors will be used, and the results can change drastically. This limitation can also be a benefit because it is possible to generate different results based on the aptitude, experience and knowledge of the decision maker.

Another problem arises when a prioritized operator is used. When different experts analyze the same problem, it is common that not all decision makers place the same importance on the results because they are lower in the hierarchy or have less experience in the field; therefore, a weight of importance must be assigned to each expert. The main problem with this is that the people who have more experience in an area may not necessarily have greater knowledge of the problem, and those who are hierarchically superior should not always have greater importance or influence on the results; therefore, a change in the weights assigned to each decision maker may change the results.

5. Conclusions

The main objective of this study was to present an application of the OWA operator and its extension, the prioritized OWA (POWA) operator, in an analysis of the SDGs for 166 countries in the world. The purpose was to propose an analysis of the evaluation of each goal with a different assigned relative importance rather than an evaluation in which the goals are considered equally important. Additionally, with the information provided by five experts, a proposition of relative weights was made based on PCT.

An interesting finding is that all of the experts consider zero hunger and clean water sanitation to be most important goals, indicating that these are problems that must be solved first and require additional effort. To analyze the information, a specific analysis of the top ten ranked countries in terms of SDG achievement was performed, and some interesting findings were discussed. In summary, it is possible to visualize some important changes in the ranking when different weighting vectors are used. Another finding is that with the unification of the results presented by each expert based on the POWA operator, it was possible to obtain new results, thereby providing another vision and understanding of the topic.

For future research, the study can be extended to include other measurement models and the perceptions of experts of other nationalities. Additionally, the use of aggregation operators, such as the OWA operator and its extensions, in different management problems, such as in the cases of finance, law, engineering, entrepreneurship, stakeholders, economics and other fields, can be assessed. Furthermore, it is possible to formulate a new extension of the OWA operator using moving averages, logarithms and probabilities.

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## Appendix A

### Table A1. Ranking of the SDG Index Using the WA Operator.

| Rank | Country          | $e_1$ | Country   | $e_2$ | Country | $e_3$ | Country      | $e_4$ | Country | $e_5$ |
|------|------------------|-------|-----------|-------|---------|-------|-------------|-------|---------|-------|
| 1    | Denmark          | 84.89 | Denmark   | 84.43 | Finland | 79.71 | Denmark     | 89.23 | Finland | 81.32 |
| 2    | Sweden           | 84.83 | Sweden    | 87.80 | Denmark | 79.55 | Denmark     | 88.75 | Denmark | 81.11 |
| 3    | Finland          | 84.09 | Finland   | 87.65 | Sweden  | 79.27 | Sweden      | 88.14 | Sweden  | 78.67 |
| 4    | Austria          | 81.21 | Belgium   | 85.75 | Belgium | 77.66 | Ireland     | 86.30 | Belgium | 77.56 |
| 5    | France           | 81.06 | Norway    | 85.62 | Japan   | 77.17 | Austria     | 86.26 | Hungary | 77.39 |
| 6    | Norway           | 80.94 | Austria   | 85.21 | Slovenia| 76.66 | United Kingdom | 85.37 | Canada  | 77.16 |
| 7    | Slovenia         | 80.94 | Czech Republic | 85.19 | Canada | 76.54 | Czech Republic | 85.11 | Austria | 77.14 |
| 8    | Germany          | 80.91 | Slovenia  | 85.19 | Hungary | 76.51 | Belgium     | 84.82 | Czech Republic | 76.69 |
| 9    | Czech Republic   | 80.85 | United Kingdom | 84.71 | Ireland | 76.48 | Hungary     | 84.21 | Ireland | 76.20 |
| 10   | Netherlands      | 80.76 | Japan     | 84.59 | Czech Republic | 76.27 | Italy       | 83.64 | Romania | 76.16 |
| 11   | Estonia          | 80.71 | France    | 84.31 | New Zealand | 75.92 | Canada      | 83.42 | New Zealand | 75.84 |
| 12   | Ireland          | 80.55 | New Zealand | 84.16 | United Kingdom | 75.88 | Norway      | 83.10 | Japan | 75.83 |
| 13   | United Kingdom New Zealand | 80.27 | Hungary | 84.14 | Norway | 75.70 | New Zealand | 82.84 | United Kingdom | 75.71 |
| 14   | New Zealand      | 79.95 | Estonia   | 84.00 | Estonia | 75.43 | France      | 82.73 | Slovenia | 75.50 |
| 15   | Belgium          | 79.76 | Ireland   | 83.85 | Malta   | 75.25 | Switzerland | 82.46 | Switzerland | 75.41 |
| 16   | Japan            | 79.76 | Canada    | 83.56 | New Zealand | 75.25 | Romania     | 82.10 | Norway | 75.39 |
| 17   | Switzerland      | 79.50 | Germany   | 83.05 | Chile   | 74.70 | Nepal       | 82.02 | Chile | 75.25 |
| 18   | Croatia          | 78.99 | Netherlands | 82.46 | Germany | 74.50 | Slovenia    | 81.71 | Malta | 74.74 |
| 19   | Belarus          | 78.94 | Poland    | 82.46 | Poland  | 74.46 | Estonia     | 81.34 | France | 74.59 |
| 20   | Latvia           | 78.91 | Latvia    | 82.05 | Bulgaria| 74.40 | Japan       | 80.91 | Nepal | 74.50 |
| 21   | Canada           | 78.73 | Switzerland | 81.87 | France  | 74.26 | Latvia      | 79.40 | Bulgaria | 74.09 |
| 22   | Poland           | 78.68 | Romania   | 81.82 | Slovak Republic | 74.26 | Chile       | 78.90 | Lithuania | 73.90 |
| 23   | Slovak Republic  | 78.40 | Portugal  | 81.71 | Portugal| 74.25 | Lithuania   | 78.87 | Estonia | 73.67 |
| 24   | Chile            | 78.23 | Malta     | 81.06 | Switzerland | 74.15 | Malta       | 78.53 | Latvia | 73.62 |
| 25   | Portugal         | 78.19 | Chile     | 80.92 | Latvia  | 74.14 | Germany     | 78.00 | Netherlands | 73.46 |
| 26   | Hungary          | 78.12 | Italy     | 80.51 | Netherlands | 73.78 | Armenia     | 77.46 | Portugal | 73.45 |
| 27   | Korea, Rep.      | 78.08 | United States | 80.25 | Austria | 73.47 | Iceland     | 77.25 | Germany | 73.20 |
| 28   | Spain            | 77.86 | Bulgaria  | 79.81 | United States | 73.41 | Spain       | 76.64 | Moldova | 73.14 |
| 29   | Iceland          | 77.74 | Slovak Republic | 79.69 | Lithuania | 73.39 | Korea, Rep. | 76.59 | Italy | 72.87 |
| 30   | Italy            | 77.52 | Korea, Rep. | 79.69 | Korea, Rep. | 73.21 | Cyprus      | 76.56 | Korea, Rep. Slovak Republic | 72.68 |
| 31   | Malta            | 77.05 | Lithuania | 79.16 | Italy   | 72.94 | United States | 76.48 | Slovak Republic | 72.39 |
| 32   | United States    | 76.51 | Iceland   | 79.11 | Iceland | 72.59 | Albania     | 76.31 | Cyprus | 72.27 |
| 33   | Australia        | 76.05 | Croatia   | 78.51 | Belarus | 72.47 | Slovak Republic | 76.14 | United States | 72.26 |
| 34   | Lithuania        | 75.80 | Spain     | 78.25 | Spain   | 72.21 | Netherlands | 76.04 | Poland North Macedonia | 71.89 |
| 35   | Cyprus           | 75.60 | Moldova   | 78.03 | Cyprus  | 72.10 | Portugal    | 75.71 | | 71.54 |
| Rank | Country            | $e_1$ | Country      | $e_2$ | Country         | $e_3$ | Country      | $e_4$ | Country         | $e_5$ |
|------|--------------------|------|--------------|------|----------------|------|--------------|------|----------------|------|
| 36   | Serbia             | 75.35| Belarus      | 77.93| Uruguay        | 71.87| Poland       | 73.82| Greece         | 71.08|
| 37   | Romania            | 75.30| Nepal        | 77.80| Moldova        | 71.71| Israel       | 73.61| Spain          | 70.81|
| 38   | Costa Rica         | 75.03| Serbia       | 76.70| Ukraine        | 71.48| Bulgaria     | 73.29| Uruguay        | 70.80|
| 39   | Greece             | 74.80| Cuba         | 76.40| Ecuador        | 71.42| Colombia     | 72.68| Cuba           | 70.23|
| 40   | Bulgaria           | 74.68| Cyprus       | 76.28| Serbia         | 71.13| Moldova      | 72.57| Bosnia and Herzegovina | 69.95|
| 41   | Uruguay            | 74.64| Ukraine      | 76.08| Israel         | 71.09| Belarus      | 72.26| Australia      | 69.71|
| 42   | Thailand           | 74.52| Argentina    | 75.41| North Macedonia| 70.80| Australia    | 72.21| Ukraine        | 69.66|
| 43   | Cuba               | 74.52| Israel       | 75.28|                |      | Georgia      | 72.18| Belarus        | 69.62|
| 44   | Moldova            | 74.49| Armenia      | 74.63| Nicaragua      | 70.50|            |      |                |      |
| 45   | Ukraine            | 74.47| Australia    | 74.59| Croatia        | 70.39| Malaysia     | 71.76| Brazil         | 69.35|
| 46   | Ecuador            | 74.38| Uruguay      | 74.50| Australia      | 70.01| Russian Federation | 71.47|
| 47   | Luxembourg         | 74.37| Georgia      | 74.39| Cuba           | 69.90| Kyrgyz Republic | 71.22|
| 48   | Israel             | 74.12| Ecuador      | 74.39| Brazil         | 69.88| Oman         | 71.07| Kyrgyz Republic | 69.18|
| 49   | Bosnia and Herzegovina | 73.97| Kyrgyz Republic | 74.08| Nepal          | 69.87| Ukraine      | 71.05| Russian Federation | 69.12|
| 50   | Vietnam            | 73.72| Costa Rica   | 73.80| Armenia        | 69.68| Ecuador      | 70.87| Georgia        | 69.08|
| 51   | Argentina          | 73.54| Bosnia and Herzegovina | 73.71| Argentina    | 69.62| Uruguay      | 70.71| Israel         | 68.83|
| 52   | China              | 73.52| Tunisia      | 73.55| Greece         | 69.57| Croatia      | 70.57| Serbia         | 68.81|
| 53   | Kyrgyz Republic   | 73.23| North Macedonia | 73.53| Oman           | 69.50| China        | 70.52| China          | 68.71|
| 54   | Brazil             | 73.09| Algeria      | 73.50| Georgia        | 69.31| North Macedonia | 69.87|
| 55   | Georgia            | 72.83| Greece       | 73.24| Maldives       | 69.30| Argentina   | 69.69| Nicaragua      | 68.44|
| 56   | Peru               | 72.63| Luxembourg   | 73.22| Bosnia and Herzegovina | 69.01| Brazil       | 68.51| Turkey         | 68.04|
| 57   | North Macedonia    | 72.37| Russian Federation | 73.02| Bolivia       | 68.97| Tunisia      | 68.46| Argentina      | 67.64|
| 58   | Azerbaijan         | 72.32| Maldives     | 73.01| Barbados       | 68.81| Cuba         | 68.21| Croatia        | 67.35|
| 59   | Uzbekistan         | 71.83| Thailand     | 72.88|                |      |            |      |                |      |
| 60   | Algeria            | 71.77| Oman         | 72.73| Turkey         | 68.50| Maldives     | 67.81| Namibia        | 67.13|
| 61   | Kazakhstan         | 71.53| Nicaragua    | 72.67| Tunisia        | 68.31| Nicaragua   | 66.68| Maldives       | 67.10|
| 62   | Colombia           | 71.41| Kazakhstan   | 72.57| Azerbaijan     | 67.81| Bolivia     | 66.67| Lebanon        | 66.40|
| 63   | Malaysia           | 71.35| Iran, Islamic Rep. | 72.38| Thailand      | 67.69| Azerbaijan | 66.54| Botswana       | 66.16|
| 64   | Albania            | 71.32| Morocco      | 71.85| China          | 67.56| Uzbekistan   | 66.45| Azerbaijan      | 66.08|
| 65   | Russian Federation | 71.22| China        | 71.84| Paraguay       | 67.23| El Salvador  | 66.30| Dominican Republic | 66.02|
| 66   | Iran, Islamic Rep. | 71.20| Azerbaijan   | 71.40| Costa Rica     | 67.01| Algeria      | 66.19| Mexico         | 65.90|
| Rank | Country            | $e_1$ | Country            | $e_2$ | Country            | $e_3$ | Country            | $e_4$ | Country            | $e_5$ |
|------|--------------------|-------|--------------------|-------|--------------------|-------|--------------------|-------|--------------------|-------|
| 67   | Morocco            | 71.10 | Bolivia            | 71.08 | Vietnam            | 66.94 | Paraguay           | 66.00 | Colombia           | 65.72 |
| 68   | Mexico             | 70.98 | Bahrain            | 70.53 | Algeria            | 66.85 | Luxembourg         | 65.67 | Tunisia            | 65.52 |
| 69   | Tunisia            | 70.85 | Brazil             | 70.35 | Kazakhstan         | 66.83 | Dominican Republic | 65.38 | Egypt, Arab Rep.   | 65.42 |
| 70   | Bahrain            | 70.58 | Montenegro         | 70.34 | Egypt, Arab Rep.   | 66.45 | Turkey             | 65.32 | Tajikistan         | 65.27 |
| 71   | Armenia            | 70.38 | Colombia           | 70.20 | Bahrain            | 66.36 | Mexico             | 65.32 | Suriname           | 65.14 |
| 72   | Turkey             | 70.37 | Uzbekistan         | 70.11 | Suriname           | 66.27 | Greece             | 65.19 | Armenia            | 64.60 |
| 73   | Montenegro         | 70.27 | Turkey             | 70.00 | Montenegro         | 66.23 | Montenegro         | 65.09 | Jamaica            | 64.45 |
| 74   | Dominican Republic | 70.26 | Barbados           | 69.91 | Luxembourg         | 66.12 | Bahrain            | 65.06 | Trinidad and Tobago | 64.44 |
| 75   | Fiji               | 70.25 | Fiji               | 69.59 | Morocco, Islamic Rep. | 66.06 | Jamaica            | 64.36 | Fiji               | 64.42 |
| 76   | Suriname           | 70.25 | United Arab Emirates | 69.53 | Morocco, Islamic Rep. | 65.86 | Thailand           | 64.32 | Vietnam            | 64.11 |
| 77   | United Arab Emirates | 70.05 | Mexico             | 69.52 | Cambodia           | 65.58 | Barbados           | 64.29 | Malaysia           | 64.01 |
| 78   | Tajikistan         | 70.04 | Peru               | 69.51 | Mexico             | 65.57 | Costa Rica         | 64.24 | Montenegro         | 63.67 |
| 79   | El Salvador        | 69.97 | Vietnam            | 69.31 | Vietnam            | 65.51 | Kazakhstan         | 64.03 | Algeria            | 63.66 |
| 80   | Panama             | 69.67 | Brunei Darussalam | 69.28 | Lebanon             | 65.47 | Vietnam            | 63.65 | Albania            | 63.40 |
| 81   | Bolivia            | 69.58 | Paraguay           | 69.14 | Fiji               | 65.43 | Botswana           | 63.61 | Barbados           | 63.29 |
| 82   | Oman               | 69.47 | Jamaica            | 69.08 | Perú               | 65.41 | Egypt, Arab Rep.   | 63.54 | Iran, Islamic Rep. | 63.10 |
| 83   | Bhutan             | 69.38 | Saudi Arabia       | 69.06 | Bangladesh         | 65.39 | Iran, Islamic Rep. | 63.47 | Jordan             | 63.06 |
| 84   | Barbados           | 69.10 | Dominican Republic | 68.77 | Dominican Republic | 65.24 | Fiji               | 63.02 | Luxembourg         | 63.03 |
| 85   | Egypt, Arab Rep.   | 69.02 | Suriname           | 68.69 | Jordan             | 65.16 | Trinidad and Tobago | 63.01 | Bahrain            | 62.94 |
| 86   | Jamaica            | 68.89 | Lebanon            | 68.66 | Jamaica            | 64.94 | Tajikistan         | 62.98 | Kazakhstan         | 62.92 |
| 87   | Nicaragua          | 68.87 | El Salvador        | 68.38 | Saudi Arabia       | 64.88 | Lebanon            | 62.87 | Turkmenistan       | 62.88 |
| 88   | Maldives           | 68.67 | Malaysia           | 68.27 | Tajikistan         | 64.76 | Suriname           | 62.72 | Mauritius          | 62.83 |
| 89   | Cabo Verde         | 68.65 | Singapore          | 68.10 | Panama             | 64.65 | Peru               | 62.60 | Saudi Arabia       | 62.79 |
| 90   | Paraguay           | 68.62 | Tajikistan         | 68.02 | Qatar              | 64.55 | Turkmenistan       | 62.02 | El Salvador        | 62.74 |
| 91   | Brunei             | 68.53 | Bangladesh         | 67.83 | Uzbekistan         | 64.53 | Brunei Darussalam | 61.87 | Panama             | 62.68 |
| 92   | Singapore          | 67.76 | Egypt, Arab Rep.   | 67.68 | Mauritius          | 64.07 | Morocco            | 61.69 | Thailand           | 62.58 |
| 93   | Nepal              | 67.21 | Albania            | 67.57 | Colombia           | 63.96 | Philippines        | 61.21 | Cabo Verde         | 61.84 |
| 94   | Trinidad and Tobago | 67.17 | Cambodia           | 66.69 | United Arab Emirates | 63.86 | Cabo Verde         | 61.20 | Morocco            | 61.76 |
| 95   | Jordan             | 67.01 | Bhutan             | 66.62 | Venezuela, RB      | 63.76 | Bhutan             | 61.18 | Uzbekistan         | 61.70 |
| 96   | Sri Lanka          | 66.96 | Qatar              | 66.59 | Ghana              | 63.70 | Singapore          | 61.14 | Costa Rica         | 61.33 |
| 97   | Belize             | 66.77 | Belize             | 66.51 | El Salvador        | 63.40 | Peru               | 61.10 | Qatar              | 61.29 |
| 98   | Lebanon            | 66.23 | Trinidad and Tobago | 66.02 | Singapore          | 63.39 | United Arab Emirates | 61.05 | Bangladesh         | 61.10 |
| 99   | Indonesia          | 65.95 | Jordan             | 65.89 | Kuwait              | 63.19 | Bangladesh         | 61.01 | Singapore          | 61.10 |
| 100  | Philippines        | 65.71 | Kuwait             | 65.87 | Bhutan             | 62.77 | Kenya              | 60.92 | Brunei Darussalam | 60.94 |
| 101  | Turkmenistan       | 65.69 | Panama             | 65.79 | Albania            | 62.65 | Panama             | 60.60 | Bhutan             | 60.88 |
| 102  | Qatar              | 65.69 | Cabo Verde         | 65.69 | Namibia            | 62.63 | Jordan             | 60.53 | Peru               | 60.13 |
| 103  | Saudi Arabia       | 65.63 | Turkmenistan       | 65.47 | Botswana           | 62.49 | Saudi Arabia       | 60.09 | India              | 59.90 |
| 104  | Ghana              | 65.53 | Guatemala          | 65.26 | Guatemala          | 62.36 | Qatar              | 59.98 | Philippines        | 59.69 |
| 105  | Honduras           | 65.41 | Mauritius          | 64.44 | Malaysia           | 62.13 | Namibia            | 59.74 | Gabon              | 59.46 |
| Rank | Country          | $\varepsilon_1$ | Country          | $\varepsilon_2$ | Country          | $\varepsilon_3$ | Country          | $\varepsilon_4$ | Country          | $\varepsilon_5$ |
|------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|
| 106  | Mongolia         | 64.86           | Indonesia        | 64.22           | Gabon            | 62.08           | Belize           | 59.51           | Myanmar          | 59.12           |
| 107  | Venezuela, RB    | 64.66           | Honduras         | 63.98           | Cabo Verde       | 61.90           | Indonesia        | 58.65           | Venezuela, RB    | 59.10           |
| 108  | Bangladesh       | 64.60           | Sri Lanka        | 63.93           | South Africa     | 61.89           | Mauritius        | 58.21           | Iraq             | 59.00           |
| 109  | Myanmar          | 64.45           | Venezuela, RB    | 62.76           | India            | 61.55           | Honduras         | 58.01           | Kuwait           | 58.88           |
| 110  | Mauritius        | 64.42           | Botswana         | 61.63           | Sao Tome and Principe | 61.52         | Sao Tome and Principe | 57.95         | United Arab Emirates | 58.44         |
| 111  | Sao Tome and Principe | 63.99       | Myanmar          | 61.61           | Iraq             | 61.34           | Gabon            | 57.63           | Vanuatu          | 57.48           |
| 112  | Cambodia         | 63.75           | Kenya            | 61.36           | Indonesia        | 61.08           | Guatemala        | 57.57           | Guatemala        | 58.43           |
| 113  | South Africa     | 63.59           | Mongolia         | 60.84           | Guyana           | 61.00           | South Africa     | 57.43           | Sri Lanka        | 58.41           |
| 114  | Kuwait           | 63.57           | Philippines      | 60.47           | Sri Lanka        | 60.78           | Cambodia         | 57.17           | Mongolia         | 58.40           |
| 115  | Iraq             | 63.13           | Ghana            | 60.14           | Vanuatu          | 60.71           | Mongolia         | 57.06           | Belize           | 58.11           |
| 116  | Gabon            | 62.99           | Gabon            | 60.14           | Belize           | 60.54           | Cambodia         | 56.55           | Cambodia         | 57.79           |
| 117  | Lao PDR          | 62.84           | South Africa     | 59.92           | Honduras         | 60.50           | Iraq             | 56.31           | Vanuatu          | 57.48           |
| 118  | Guatemala        | 62.13           | Namibia          | 59.79           | Trinidad and Tobago | 60.46         | Myanmar          | 56.02           | Honduras         | 57.26           |
| 119  | India            | 62.02           | Iraq             | 59.45           | Lao PDR          | 60.36           | India            | 55.63           | Indonesia        | 57.02           |
| 120  | Botswana         | 61.92           | India            | 58.91           | Philippines      | 59.92           | Kuwait           | 54.59           | Guyana           | 56.59           |
| 121  | Namibia          | 61.81           | Sao Tome and Principe | 58.68       | Uganda           | 59.34           | Vanuatu          | 53.99           | South Africa     | 56.17           |
| 122  | Vanuatu          | 60.87           | Lao PDR          | 58.65           | Burkina Faso     | 59.32           | Ghana            | 53.81           | Senegal           | 55.80           |
| 123  | Guyana           | 60.37           | Guyana           | 57.89           | Myanmar          | 59.11           | South Africa     | 52.72           | Kenya            | 55.70           |
| 124  | Kenya            | 60.27           | Zimbabwe         | 56.76           | Mongolia         | 58.77           | Guyana           | 52.55           | Burkina Faso     | 55.37           |
| 125  | Zimbabwe         | 60.20           | Vanuatu          | 55.68           | Tanzania         | 58.03           | Burkina Faso     | 50.49           | Tanzania         | 54.74           |
| 126  | Senegal          | 59.52           | Senegal          | 54.74           | Turkmenistan     | 57.73           | Lao PDR          | 50.38           | Angola           | 54.31           |
| 127  | Sriyian Arab Republic | 59.29       | Tanzania         | 54.32           | Syrian Arab Republic | 57.69       | Senegal          | 48.94           | Syrian Arab Republic | 53.70         |
| 128  | Rwanda           | 58.30           | Syrian Arab Republic | 53.71       | Cameroon         | 57.63           | Uganda           | 48.58           | Pakistan         | 52.89           |
| 129  | Cote d'Ivoire    | 58.10           | Cameroon         | 53.23           | Ethiopia         | 56.35           | Afghanistan      | 47.82           | Uganda           | 52.62           |
| 130  | Gambia, The      | 57.63           | Congo, Rep.      | 52.46           | Angola           | 56.27           | Tanzania         | 47.46           | Ethiopia         | 52.53           |
| 131  | Cameroon         | 57.36           | Burkina Faso     | 52.00           | Djibouti         | 56.25           | Togo             | 47.40           | Mozambique       | 52.51           |
| 132  | Tanzania         | 57.11           | Uganda           | 51.50           | Mozambique       | 56.11           | Angola           | 47.19           | Togo             | 52.05           |
| 133  | Congo, Rep.      | 57.11           | Angola           | 51.12           | Pakistan         | 55.49           | Myanmar          | 46.95           | Ghana            | 51.82           |
| 134  | Mauritania       | 56.04           | Rwanda           | 51.12           | Mauritania       | 55.42           | Ethiopia         | 46.69           | Malawi           | 50.81           |
| 135  | Burkina Faso     | 55.44           | Ethiopia         | 50.22           | Lesotho          | 55.30           | Benin            | 45.96           | Zimbabwe         | 50.48           |
| 136  | Ethiopia         | 55.30           | Mauritania       | 49.01           | Kenya            | 54.90           | Congo, Rep.      | 45.84           | Mauritania       | 50.45           |
| 137  | Pakistan         | 55.05           | Lesotho          | 48.67           | Togo             | 54.80           | Mauritania       | 45.80           | Benin            | 50.11           |
| 138  | Mozambique       | 54.90           | Benin            | 48.64           | Mali              | 54.76           | Pakistan         | 45.76           | Rwanda           | 50.00           |
| 139  | Burundi          | 54.82           | Cote d'Ivoire    | 48.56           | Haiti             | 54.75           | Mozambique       | 45.35           | Afghanistan      | 49.13           |
| 140  | Benin            | 54.71           | Mozambique       | 48.36           | Senegal          | 54.40           | Haiti            | 45.20           | Comoros          | 48.82           |
| 141  | Lesotho          | 54.70           | Togo             | 48.31           | Congo, Rep.      | 54.25           | Cameroon         | 44.99           | Cameroon         | 48.75           |
| 142  | Togo             | 54.23           | Djibouti         | 48.05           | Gambia, The      | 54.02           | Papua New Guinea | 44.40           | Lao PDR          | 47.87           |
### Table A1. Cont.

| Rank | Country         | $e_1$ | Country         | $e_2$ | Country         | $e_3$ | Country         | $e_4$ | Country         | $e_5$ |
|------|----------------|------|----------------|------|----------------|------|----------------|------|----------------|------|
| 143  | Eswatini       | 54.20| Haiti          | 47.29| Eswatini       | 53.84| Malawi         | 43.79| Congo, Rep.     | 47.80|
| 144  | Uganda         | 54.07| Afghanistan   | 46.93| Sudan          | 53.84| Rwanda         | 43.68| Djibouti       | 47.36|
| 145  | Zambia         | 53.97| Eswatini       | 46.89| Rwanda         | 53.84| Djibouti      | 43.62| Mali           | 46.94|
| 146  | Djibouti       | 53.95| Papua New Guinea | 46.51| Niger          | 53.83| Cote d’Ivoire | 43.39| Niger          | 46.57|
| 147  | Malawi         | 53.53| Gambia, The Pakistan | 46.46| Benin          | 53.64| Madagascar    | 43.09| Cote d’Ivoire | 46.31|
| 148  | Angola         | 52.94| Pakistan       | 46.30| Zimbabwe       | 53.28| Mali          | 42.61| Madagascar    | 46.09|
| 149  | Afghanistan    | 52.88| Malawi         | 46.18| Afghanistan   | 53.13| Niger         | 42.24| Congo, Dem. Rep. | 45.53|
| 150  | Comoros        | 52.82| Zamb | 46.01| Yemen, Rep.    | 52.89| Lesotho       | 41.38| Yemen, Rep.    | 45.33|
| 151  | Sierra Leone   | 52.59| Burundi        | 45.95| Madagascar    | 52.75| Sierra Leone | 41.34| Gambia, The | 45.14|
| 152  | Haiti          | 52.48| Mali           | 45.83| Sudan         | 52.58| Congo, Dem. Rep. | 41.18| Madagascar    | 45.09|
| 153  | Guinea         | 52.40| Sudan         | 45.83| Guinea        | 52.40| Congo, Dem. Rep. | 40.69| Eswatini      | 45.01|
| 154  | Papua New Guinea | 51.96| Madagascar    | 45.55| Malawi        | 51.50| Yemen, Rep.  | 39.71| Papua New Guinea | 44.93|
| 155  | Mali           | 51.57| Yemen, Rep.    | 44.45| Sierra Leone  | 51.45| Guinea       | 39.61| Sudan         | 44.81|
| 156  | Congo, Dem. Rep. | 51.05| Guinea        | 43.01| Comoros       | 51.33| Gambia, The | 39.11| Zamb | 44.73|
| 157  | Niger          | 50.58| Nigeria       | 42.57| Papua New Guinea | 50.99| Comoros      | 38.92| Lesotho       | 44.72|
| 158  | Madagascar     | 50.25| Sierra Leone  | 42.20| Congo, Dem. Rep. | 41.63| Congo, Dem. Rep. | 49.97| Zamb | 44.07|
| 159  | Yemen, Rep.    | 50.16| Congo, Dem. Rep. | 41.63| Comoros       | 41.42| Liberia           | 49.66| Somalia       | 37.02|
| 160  | Nigeria        | 50.05| Comoros       | 41.42| Liberia       | 49.66| Somalia       | 37.02| Liberia       | 43.75|
| 161  | Sudan          | 48.87| Niger         | 40.04| Somalia       | 49.65| Burundi      | 36.83| Niger         | 43.36|
| 162  | Liberia        | 47.72| Liberia       | 38.55| Cote d’Ivoire | 49.61| Nigeria      | 36.34| South Sudan  | 41.91|
| 163  | Somalia        | 46.42| Somalia       | 38.08| Burundi       | 47.80| Liberia       | 34.09| Burundi       | 40.92|
| 164  | South Sudan    | 44.09| Chad          | 33.65| Chad          | 44.70| South Sudan | 30.29| Somalia       | 39.08|
| 165  | Chad           | 42.89| South Sudan   | 30.99| Chad          | 44.02| Chad         | 28.75| Chad          | 36.42|
| 166  | Central African Republic | 39.49| African Republic | 29.00| African Republic | 41.46| African Republic | 25.16| African Republic | 35.44|

### Table A2. Ranking of the SDG Index Using the OWA Operator.

| Rank | Country         | $e_1$ | Country         | $e_2$ | Country         | $e_3$ | Country         | $e_4$ | Country         | $e_5$ |
|------|----------------|------|----------------|------|----------------|------|----------------|------|----------------|------|
| 1    | Denmark        | 88.87| Sweden         | 88.82| Sweden         | 91.37| Norway         | 94.90| Sweden         | 94.54|
| 2    | Sweden         | 88.83| Denmark        | 88.78| Denmark        | 91.35| Sweden         | 94.87| Norway         | 94.36|
| 3    | Finland        | 87.91| Norway         | 88.18| Finland        | 90.59| Denmark        | 94.49| Denmark        | 94.20|
| 4    | Norway         | 86.70| Finland        | 88.18| Norway         | 90.22| Finland        | 94.29| Finland        | 93.85|
| 5    | Netherlands    | 85.17| Switzerland    | 86.29| Netherlands    | 88.29| Switzerland    | 93.75| Switzerland    | 93.22|
| 6    | Austria        | 85.13| Netherlands    | 86.14| Switzerland    | 88.26| Iceland        | 92.79| Netherlands    | 92.44|
| 7    | Germany        | 84.88| Austria        | 85.85| Austria        | 88.10| Netherlands    | 92.75| Iceland        | 92.33|
| 8    | France         | 84.71| Slovenia       | 85.79| Slovenia       | 87.85| Slovenia       | 92.48| Slovenia       | 92.31|
| 9    | Czech Republic | 84.63| Iceland        | 85.72| Germany        | 87.52| Austria        | 92.20| Austria        | 91.86|
| 10   | Switzerland    | 84.59| New Zealand    | 85.16| France         | 87.46| United Kingdom | 91.83| France         | 91.61|
| 11   | Slovenia        | 84.55| Ireland        | 85.13| Czech Republic | 87.45| New Zealand    | 91.81| New Zealand    | 91.60|
| 12   | Estonia         | 84.46| United Kingdom | 85.08| Ireland        | 87.36| Czech Republic | 91.52| United Kingdom | 91.41|
| 13   | Belgium         | 84.34| Estonia        | 85.03| Iceland        | 87.36| France         | 91.49| Belgium         | 91.40|
| 14   | Ireland         | 84.28| Czech Republic | 85.03| New Zealand    | 87.33| Belgium        | 91.47| Germany        | 91.35|
| 15   | United Kingdom  | 84.22| Belgium        | 85.02| Belgium        | 87.32| Ireland        | 91.41| Ireland        | 91.22|
| Rank | Country | $e_1$ | Country | $e_2$ | Country | $e_3$ | Country | $e_4$ | Country | $e_5$ |
|------|---------|-------|---------|-------|---------|-------|---------|-------|---------|-------|
| 16   | New Zealand | 84.00 | Germany | 85.02 | Estonia | 87.30 | Germany | 91.39 | Czech Republic | 91.21 |
| 17   | Iceland | 83.41 | France | 84.99 | United Kingdom | 87.29 | Japan | 91.37 | Japan | 91.17 |
| 18   | Japan | 83.35 | Japan | 84.16 | Japan | 86.53 | Estonia | 91.19 | Estonia | 91.09 |
| 19   | Korea, Rep. | 82.71 | Canada | 84.01 | Canada | 86.05 | Latvia | 91.04 | Latvia | 90.93 |
| 20   | Canada | 82.71 | Latvia | 83.93 | Latvia | 85.95 | Korea, Rep. | 90.93 | Korea, Rep. | 90.83 |
| 21   | Belarus | 82.71 | Korea, Rep. | 83.82 | Australia | 85.87 | Australia | 90.81 | Canada | 90.60 |
| 22   | Latvia | 82.55 | Australia | 83.61 | Spain | 85.40 | Canada | 90.65 | Australia | 90.44 |
| 23   | Spain | 82.29 | Malta | 83.38 | Australia | 85.27 | Malta | 90.58 | Malta | 90.34 |
| 24   | Poland | 82.18 | Spain | 83.21 | Belarus | 85.19 | United States | 90.36 | United States | 90.15 |
| 25   | Chile | 81.97 | Portugal | 82.84 | Malta | 85.16 | Spain | 89.90 | Portugal | 89.55 |
| 26   | Portugal | 81.77 | Poland | 82.82 | Poland | 85.07 | Portugal | 89.55 | Portugal | 89.63 |
| 27   | Hungary | 81.61 | United States | 82.80 | Portugal | 84.92 | Singapore | 89.53 | Luxembourg | 89.42 |
| 28   | Slovak Republic | 81.38 | Belarus | 82.63 | Chile | 84.90 | Luxembourg | 89.39 | Poland | 89.37 |
| 29   | Croatia | 81.31 | Chile | 82.61 | United States | 84.82 | Israel | 89.35 | Israel | 89.25 |
| 30   | Malta, United States | 81.24 | Hungary | 82.11 | Hungary | 84.44 | Poland | 89.34 | Chile | 89.08 |
| 31   | Australia | 81.16 | Luxembourg | 81.95 | Slovak Republic | 84.10 | Chile | 89.13 | Belarus | 88.97 |
| 32   | Italy | 81.12 | Slovak Republic | 81.75 | Italy | 83.97 | Belarus | 88.95 | Singapore | 88.54 |
| 33   | Luxembourg | 80.97 | Italy | 81.73 | Luxembourg | 83.86 | Hungary | 88.58 | Hungary | 88.49 |
| 34   | Cyprus | 80.03 | Israel | 81.47 | Croatia | 83.38 | Ukraine | 88.38 | Italy | 88.46 |
| 35   | Cyprus | 80.02 | Cyprus | 81.26 | Cyprus | 83.29 | Italy | 88.24 | Ukraine | 88.44 |
| 36   | Costa Rica | 79.82 | Cuba | 80.96 | Israel | 83.23 | Slovak Republic | 88.00 | Cyprus | 88.13 |
| 37   | Israel | 79.49 | Ukraine | 80.81 | Ukraine | 82.78 | Cyprus | 87.99 | Slovak Republic | 88.07 |
| 38   | Lithuania | 79.39 | Costa Rica | 80.66 | Costa Rica | 82.74 | Cuba | 87.99 | Cuba | 87.66 |
| 39   | Ukraine | 79.23 | Croatia | 80.55 | Cuba | 82.58 | Uruguay | 87.66 | Lithuania | 87.27 |
| 40   | Moldova | 79.14 | Singapore | 80.52 | Lithuania | 82.49 | Lithuania | 87.27 | Uruguay | 87.41 |
| 41   | Ecuador | 79.07 | Lithuania | 80.35 | Uruguay | 82.35 | Moldova | 87.04 | Moldova | 87.11 |
| 42   | Serbia | 79.05 | Uruguay | 80.33 | Moldova | 82.27 | Algeria | 86.98 | Vietnam | 87.07 |
| 43   | Uruguay | 78.89 | Ecuador | 80.19 | Ecuador, Bosnia and Herzegovina | 82.11 | Greece | 86.98 | Greece | 86.93 |
| 44   | Romania | 78.77 | Moldova | 80.07 | Moldova | 81.80 | Fiji | 86.89 | Costa Rica | 86.91 |
| 45   | Cuba | 78.59 | Vietnam | 79.76 | Vietnam | 81.71 | Croatia | 86.77 | Montenegro | 86.84 |
| 46   | Bosnia and Herzegovina | 78.55 | Greece | 79.69 | Vietnam | 81.69 | Vietnam | 86.69 | Fiji | 86.63 |
| 47   | Greece | 78.51 | Greece | 79.66 | Greece | 81.69 | Vietnam | 86.69 | Bosnia and Herzegovina | 86.59 |
| 48   | Vietnam | 78.42 | China | 79.37 | Romania | 81.46 | Ecuador | 86.52 | China | 86.46 |
| 49   | China | 78.31 | Argentina | 79.37 | China | 81.46 | Montenegro, Bosnia and Herzegovina | 86.36 | China | 86.54 |
| 50   | Bulgaria | 78.13 | Serbia | 79.33 | Argentina | 81.19 | China | 86.34 | China | 86.46 |
| 51   | Thailand | 78.09 | Romania | 79.14 | Singapore | 81.05 | China | 86.25 | Ecuador | 86.37 |
| 52   | Argentina | 77.86 | Algeria | 79.11 | Algeria | 80.94 | Argentina | 86.14 | Serbia | 86.27 |
### Table A2. Cont.

| Rank | Country                          | $e_1$ | Country                          | $e_2$ | Country                          | $e_3$ | Country                          | $e_4$ | Country                          | $e_5$ |
|------|----------------------------------|-------|----------------------------------|-------|----------------------------------|-------|----------------------------------|-------|----------------------------------|-------|
| 53   | Kyrgyz Republic                  | 77.45 | Fiji                             | 78.96 | Thailand                         | 80.69 | Serbia                           | 86.07 | Argentina                       | 86.26 |
| 54   | Brazil                           | 77.33 | Peru                             | 78.65 | Bulgaria                         | 80.60 | Azerbaijan                       | 85.84 | Azerbaijan                       | 86.05 |
| 55   | Algeria                          | 77.29 | Montenegro                       | 78.54 | Azerbaijan                       | 80.56 | Turkey                           | 85.68 | Turkey                           | 85.80 |
| 56   | Azerbaijan                        | 77.25 | Kyrgyz Republic                 | 78.41 | Kyrgyz Republic                 | 80.50 | Armenia                          | 85.52 | Tunisia                          | 85.56 |
| 57   | Peru                             | 76.88 | Azerbaijan                       | 78.35 | Peru                             | 80.44 | Maldives                         | 85.49 | Romania                          | 85.47 |
| 58   | Georgia                          | 76.81 | Brazil                           | 78.32 | Brazil                           | 80.37 | Tajikistan                       | 85.45 | Albania                          | 85.40 |
| 59   | Malaysia                         | 76.32 | Thailand                         | 78.21 | Fiji                             | 80.28 | Romania                          | 85.45 | Armenia                          | 85.38 |
| 60   | Russian Federation               | 76.30 | Albania                          | 78.20 | Georgia                          | 80.13 | Peru                             | 85.42 | Tajikistan                       | 85.37 |
| 61   | Morocco                          | 76.18 | Georgia                          | 78.14 | Montenegro                       | 80.00 | Kyrgyz Republic                 | 85.41 | Maldives                         | 85.34 |
| 62   | Colombia                         | 76.09 | Bulgaria                         | 78.13 | Albania                          | 79.76 | Tunisia                          | 85.40 | Peru                             | 85.31 |
| 63   | Albania                          | 76.08 | Maldives                         | 77.92 | Malaysia                         | 79.68 | Albania                          | 85.34 | Morocco                          | 85.16 |
| 64   | Tunisia                          | 76.07 | Turkey                           | 77.90 | Morocco                          | 79.61 | Uzbekistan                       | 85.03 | Bulgaria                         | 85.15 |
| 65   | Iran, Islamic Republic           | 76.04 | Dominican Republic               | 77.87 | Uzbekistan                       | 79.59 | Georgia                          | 84.99 | Uzbekistan                       | 85.10 |
| 66   | Uzbekistan                       | 76.01 | Uzbekistan                       | 77.84 | Turkey                           | 79.52 | Morocco                          | 84.95 | Thailand                         | 85.07 |
| 67   | Fiji                             | 75.97 | Tajikistan                       | 77.82 | Russian Federation               | 79.52 | Thailand                         | 84.92 | Russian Federation               | 85.03 |
| 68   | Mexico                           | 75.93 | Malaysia                         | 77.74 | Tunisia                          | 79.49 | Brazil                           | 84.77 | Kyrgyz Republic                 | 85.00 |
| 69   | Montenegro                       | 75.83 | Morocco                          | 77.72 | Mexico                           | 79.48 | Dominican Republic               | 84.76 | Malaysia                         | 84.86 |
| 70   | Dominican Republic               | 75.76 | Mexico                           | 77.70 | Dominican Republic               | 79.41 | Malaysia                         | 84.67 | Barbados                         | 84.76 |
| 71   | Turkey                           | 75.56 | Tunisia                          | 77.59 | Colombia                         | 79.40 | Russian Federation               | 84.62 | Brazil                           | 84.69 |
| 72   | North Macedonia                  | 75.52 | Colombia                         | 77.54 | Tajikistan                       | 79.37 | Bulgaria                         | 84.59 | Georgia                          | 84.68 |
| 73   | Singapore                        | 75.45 | Russian Federation               | 77.53 | Iran, Islamic Republic           | 79.26 | Sri Lanka                        | 84.59 | Dominican Republic               | 84.65 |
| 74   | Kazakhstan                       | 75.43 | Armenia                          | 77.49 | Maldives                         | 79.03 | Mexico                           | 84.53 | Iran, Islamic Republic           | 84.47 |
| 75   | Tajikistan                       | 75.34 | Iran, Islamic Republic           | 77.21 | Armenia                          | 79.03 | Barbados                         | 84.36 | Brunei Darussalam                | 84.37 |
| 76   | United Arab Emirates             | 75.19 | El Salvador                      | 76.98 | El Salvador                      | 78.60 | Iran, Islamic Republic           | 84.27 | Sri Lanka                        | 84.33 |
| 77   | Armenia                          | 75.13 | Panama                           | 76.94 | United Arab Emirates             | 78.57 | El Salvador                      | 83.95 | Mexico                           | 84.32 |
| 78   | El Salvador                      | 74.98 | Barbados                         | 76.86 | Kazakhstan                       | 78.56 | Brunei Darussalam                | 83.93 | El Salvador                      | 83.95 |
| 79   | Panama                           | 74.68 | United Arab Emirates             | 76.84 | Panama                           | 78.43 | Colombia                         | 83.81 | Egypt, Arab Rep.                 | 83.86 |
| 80   | Maldives                         | 74.39 | Kazakhstan                       | 76.46 | North Macedonia                 | 78.26 | United Arab Emirates             | 83.77 | Bahrain                          | 83.68 |
Table A2. Cont.

| Rank | Country   | $e_1$ | Country         | $e_2$ | Country   | $e_3$ | Country       | $e_4$       | Country | $e_5$       |
|------|-----------|------|----------------|------|-----------|------|--------------|------------|---------|-------------|
| 81   | Oman      | 74.17| North Macedonia| 76.20| Barbados  | 78.19| Panama       | 83.64      | United Arab Emirates | 83.67 |
| 82   | Bolivia   | 74.02| Brunei Darussalam| 76.17| Brunei Darussalam| 77.80| Egypt, Arab Rep. | 83.53      | Panama   | 83.63       |
| 83   | Barbados  | 73.99| Sri Lanka      | 76.03| Oman      | 77.56| Kazakhstan    | 83.11      | Colombia | 83.41       |
| 84   | Nicaragua| 73.93| Egypt, Arab Rep.| 75.96| Oman      | 77.43| Bahrain      | 83.05      | Kazakhstan | 83.22 |
| 85   | Brunei Darussalam | 73.89| Bahrain          | 75.71| Sri Lanka | 77.31| Mauritius    | 82.71      | Mauritius | 82.51 |
| 86   | Egypt, Arab Rep.| 73.87| Oman            | 75.60| Bahrain   | 77.29| Oman         | 82.25      | North Macedonia | 82.40 |
| 87   | Bhutan    | 73.78| Jamaica        | 75.49| Nicaragua | 77.18| North Macedonia | 82.24      | Oman     | 82.39       |
| 88   | Jamaica   | 73.69| Nicaragua      | 75.28| Bolivia   | 77.11| Nicaragua    | 82.10      | Nicaragua | 82.04 |
| 89   | Bahrain   | 73.67| Bolivia        | 75.15| Jamaica    | 76.98| Jordan       | 81.76      | Jordan    | 81.99       |
| 90   | Paraguay  | 73.00| Bhutan         | 75.05| Bhutan    | 76.96| Bolivia      | 81.72      | Bhutan    | 81.78       |
| 91   | Sri Lanka | 72.85| Paraguay       | 74.69| Paraguay  | 76.40| Bolivia      | 81.72      | Nepal     | 81.78       |
| 92   | Suriname  | 72.66| Jordan         | 74.40| Jordan    | 76.05| Jamaica      | 81.58      | Nepal     | 81.78       |
| 93   | Jordan    | 72.52| Mauritius      | 74.08| Lebanon   | 75.30| Paraguay     | 81.19      | Lebanon   | 81.53       |
| 94   | Cabo Verde | 72.27| Lebanon        | 73.58| Cabo Verde| 75.11| Lebanon      | 81.13      | Jamaica   | 81.47       |
| 95   | Lebanon   | 71.68| Trinidad and Tobago | 73.36| Mauritius | 75.10| Nepal        | 81.05      | Paraguay  | 81.25       |
| 96   | Trinidad and Tobago | 71.27| Qatar          | 73.30| Suriname  | 74.99| Qatar        | 80.71      | Trinidad and Tobago | 81.05 |
| 97   | Nepal     | 71.19| Cabo Verde    | 73.27| Nepal     | 74.95| Trinidad and Tobago | 80.53      | Saudi Arabia | 81.00 |
| 98   | Saudi Arabia | 70.80| Nepal          | 73.26| Trinidad and Tobago | 74.88| Saudi Arabia | 80.46      | Qatar     | 80.88       |
| 99   | Qatar     | 70.65| Saudi Arabia  | 73.04| Qatar     | 74.64| Cambodia     | 80.00      | Cambodia  | 80.74       |
| 100  | Philippines | 70.35| Suriname      | 72.69| Saudi Arabia | 74.55| Indonesia    | 79.50      | Philippines | 79.82 |
| 101  | Belize    | 70.34| Belize        | 72.39| Belize    | 73.94| Cabo Verde  | 79.28      | Indonesia | 79.75       |
| 102  | Mauritius | 70.34| Honduras      | 72.32| Indonesia | 73.90| Philippines | 79.38      | Myanmar  | 79.75       |
| 103  | Indonesia | 70.30| Indonesia     | 72.32| Philippines| 73.88| Indonesia    | 79.19      | Bangladesh | 79.33 |
| 104  | Honduras  | 70.23| Philippines   | 72.22| Philippines| 73.80| Venezuela, RB| 79.11      | Iraq     | 79.32       |
| 105  | Ghana     | 69.80| Cambodia      | 72.14| Cambodia  | 73.66| Cambodia     | 79.02      | Kuwait    | 79.27       |
| 106  | Myanmar   | 69.77| Venezuela, RB | 71.79| Myanmar   | 73.51| Myanmar     | 79.09      | Kuwait    | 79.27       |
| 107  | Cambodia  | 69.76| Myanmar      | 71.77| Ghana     | 73.23| Belize      | 79.02      | Cabo Verde | 79.18 |
| 108  | Bangladesh| 68.86| Iraq          | 71.68| Iraq      | 72.78| Ghana       | 78.73      | Bangladesh| 79.11       |
| 109  | Mongolia  | 68.78| Ghana        | 71.27| Bangladesh| 72.71| Kuwait      | 78.69      | Ghana    | 79.07       |
| Rank | Country       | $e_1$ | Country   | $e_2$ | Country          | $e_3$ | Country          | $e_4$ | Country          | $e_5$ |
|------|---------------|------|-----------|------|------------------|------|------------------|------|------------------|------|
| 110  | Iraq          | 68.69| Bangladesh| 71.05| Venezuela, RB    | 72.68| Bangladesh       | 78.66| Syrian Arab Republic | 78.92|
| 111  | South Africa  | 68.53| Guatemala | 71.01| Kuwait           | 72.27| Lao PDR          | 78.64| India            | 78.38|
| 112  | Turkmenistan  | 68.37| Namibia   | 70.95| Guatemalan       | 72.22| Guatemala        | 78.40| Lao PDR          | 78.62|
| 113  | Kuwait        | 68.33| Kuwait    | 70.78| Sao Tome and Principe | 72.19| India            | 78.38| Sao Tome and Principe | 78.61|
| 114  | Sao Tome and Principe | 68.25| Sao Tome and Principe | 70.78| Mongolia      | 71.99| Sao Tome and Principe | 78.30| Venezuela, RB | 78.61|
| 115  | Venezuela, RB | 68.16| Lao PDR   | 70.33| Namibia          | 71.94| Syrian Arab Republic | 78.25| Guatemala       | 78.58|
| 116  | Gabon         | 68.01| South Africa | 70.29| South Africa     | 71.85| Suriname         | 77.94| Mauritania      | 78.04|
| 117  | Namibia       | 67.91| Gabon     | 70.26| Lao PDR          | 71.84| Mauritania       | 77.86| Gabon           | 78.02|
| 118  | Guatemala     | 67.89| Mongolia  | 70.12| Turkmenistan     | 71.76| Zimbabwe         | 77.71| Zimbabwe        | 77.90|
| 119  | Lao PDR       | 67.65| India     | 70.09| Gabon            | 71.62| Namibia          | 77.52| Suriname        | 77.78|
| 120  | India         | 67.29| Turkmenistan | 70.03| India            | 71.48| Gabon            | 77.49| Mongolia        | 77.40|
| 121  | Botswana      | 67.10| Syrian Arab Republic | 69.90| Syrian Arab Republic | 70.68| Gambia, The     | 77.31| Gambia, The     | 77.36|
| 122  | Vanuatu       | 66.21| Zimbabwe  | 69.14| Botswana         | 70.35| South Africa     | 76.87| Namibia         | 77.28|
| 123  | Guyana        | 65.95| Guyana    | 68.92| Zimbabwe         | 70.32| Mongolia         | 76.78| Lesotho         | 76.82|
| 124  | Syria Arab Republic | 65.80| Botswana  | 68.92| Guyana           | 69.99| Lesotho          | 76.53| Turkmenistan    | 76.70|
| 125  | Zimbabwe      | 65.69| Gambia, The | 68.71| Vanuatu          | 69.76| Turkmenistan     | 76.52| Yemen, Rep.     | 76.64|
| 126  | Kenya         | 65.16| Mauritania| 68.28| Gambia, The      | 69.64| Guyana           | 76.19| Guyana          | 76.61|
| 127  | Gambia, The   | 64.65| Vanuatu   | 68.24| Mauritania       | 69.22| Burkina Faso     | 75.98| Burkina Faso    | 76.56|
| 128  | Mauritania    | 64.16| Lesotho   | 67.96| Kenya            | 68.84| Yemen, Rep.      | 75.81| South Africa    | 76.26|
| 129  | Senegal       | 63.94| Kenya     | 67.23| Senegal          | 67.99| Vanuatu          | 75.18| Congo, Rep.     | 76.01|
| 130  | Cote d’Ivoire| 63.29| Burkina Faso | 67.23| Lesotho         | 67.95| Kenya            | 75.14| Kenya           | 75.59|
| 131  | Rwanda        | 63.15| Congo, Rep. | 66.81| Burkina Faso     | 67.76| Mozambique       | 75.14| Vanuatu         | 75.44|
| 132  | Tanzania      | 62.82| Senegal   | 66.63| Botswana         | 67.54| Mozambique       | 75.14| Vanuatu         | 75.03|
| 133  | Congo, Rep.   | 62.71| Mozambique| 66.17| Congo, Rep.      | 67.34| Congo, Rep.      | 74.78| Benin           | 75.07|
| 134  | Burkina Faso  | 62.52| Rwanda    | 66.13| Tanzania         | 67.25| Tanzania         | 74.70| Tanzania        | 75.03|
| 135  | Lesotho       | 62.19| Tanzania  | 66.04| Rwanda           | 67.12| Niger            | 74.57| Mozambique      | 74.99|
| 136  | Cameroon      | 62.03| Cote d’Ivoire | 66.00| Mozambique       | 66.86| Guinea           | 74.46| Botswana        | 74.95|
| 137  | Pakistan      | 61.98| Yemen, Rep. | 65.96| Ethiopia         | 66.35| Senegal          | 74.28| Senegal         | 74.92|
| 138  | Mozambique    | 61.57| Burundi   | 65.89| Burundi          | 66.30| Benin            | 74.10| Ethiopia        | 74.90|
| 139  | Ethiopia      | 61.56| Benin     | 65.50| Pakistan         | 66.24| Ethiopia         | 74.01| Ethiopia        | 74.81|
| 140  | Burundi       | 61.53| Ethiopia  | 65.40| Yemen, Rep.      | 66.23| Cote d’Ivoire    | 73.96| Niger           | 74.64|
Table A2. Cont.

| Rank | Country   | $e_1$ | Country   | $e_2$ | Country   | $e_3$ | Country   | $e_4$ | Country   | $e_5$ |
|------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|-----------|-------|
| 141  | Afghanistan | 60.87 | Guinea    | 65.14 | Cameroon  | 66.16 | Afghanistan | 73.92 | Guinea    | 74.60 |
| 142  | Benin      | 60.68 | Pakistan  | 65.03 | Benin     | 65.84 | Burundi    | 73.74 | Pakistan  | 74.14 |
| 143  | Djibouti   | 60.47 | Afghanistan | 64.95 | Afghanistan | 65.77 | Rwanda     | 73.41 | Burundi    | 74.10 |
| 144  | Yemen, Rep.| 60.31 | Niger     | 64.87 | Guinea    | 65.65 | Pakistan  | 73.30 | Rwanda     | 73.90 |
| 145  | Eswatini   | 60.14 | Cameroon  | 64.69 | Djibouti  | 65.10 | Togo       | 72.92 | Togo       | 73.54 |
| 146  | Guinea     | 60.07 | Togo      | 64.24 | Togo      | 64.84 | Mali       | 72.88 | Cameroon   | 73.35 |
| 147  | Uganda     | 59.99 | Sierra Leone | 64.07 | Niger     | 64.73 | Sierra Leone | 72.78 | Sierra Leone | 73.25 |
| 148  | Zambia     | 59.92 | Djibouti  | 64.07 | Sierra Leone | 64.72 | Cameroon   | 72.77 | Mali       | 73.13 |
| 149  | Togo       | 59.74 | Eswatini  | 64.04 | Zambian   | 64.71 | Djibouti  | 72.39 | Djibouti   | 73.00 |
| 150  | Malawi     | 59.73 | Zambia    | 63.90 | Eswatini  | 64.53 | Zambian   | 72.02 | Zambian    | 72.21 |
| 151  | Sierra Leone | 59.46 | Mali      | 63.89 | Malawi    | 64.44 | Uganda     | 71.64 | Uganda     | 72.11 |
| 152  | Mali       | 58.87 | Malawi    | 63.75 | Uganda    | 64.42 | Malawi Papua New Guinea | 71.55 | Malawi Papua New Guinea | 71.71 |
| 153  | Niger      | 58.66 | Uganda    | 63.36 | Mali      | 64.34 | New Guinea | 71.42 | New Guinea | 71.64 |
| 154  | Papua New Guinea | 58.36 | Papua New Guinea | 62.61 | Papua New Guinea | 63.38 | Madagascar | 71.00 | South Sudan | 71.44 |
| 155  | Comoros    | 58.35 | Madagascar | 61.89 | Haiti     | 62.45 | South Sudan | 70.86 | Liberia    | 71.17 |
| 156  | Angola     | 57.85 | Haiti     | 61.32 | Madagascar | 62.28 | Eswatini   | 70.83 | Madagascar | 71.09 |
| 157  | Haiti      | 57.83 | Congo, Dem. Rep. | 61.00 | Comoros   | 62.09 | Liberia    | 70.15 | Haiti      | 71.05 |
| 158  | Madagascar | 56.99 | Liberia   | 60.72 | Congo, Dem. Rep. | 61.89 | Haiti      | 70.08 | Nigeria    | 70.91 |
| 159  | Congo, Dem. Rep. | 56.93 | Nigeria   | 60.69 | Angola    | 61.59 | Nigeria    | 69.90 | Eswatini   | 70.66 |
| 160  | Nigeria    | 55.98 | Comoros   | 60.61 | Nigeria   | 61.29 | Congo, Dem. Rep. | 69.42 | Congo, Dem. Rep. | 70.10 |
| 161  | Sudan      | 55.69 | South Sudan | 60.45 | Liberia   | 60.80 | Chad       | 68.96 | Comoros    | 69.56 |
| 162  | Liberia    | 55.05 | Angola    | 60.08 | South Sudan | 60.30 | Comoros    | 68.51 | Chad       | 69.33 |
| 163  | Somalia    | 53.63 | Sudan     | 59.19 | South Sudan | 59.75 | Sudan      | 67.74 | Sudan      | 68.58 |
| 164  | South Sudan | 52.70 | Somalia   | 58.60 | Somalia   | 58.99 | Angola     | 67.52 | Angola     | 68.52 |
| 165  | Chad Central African Republic | 51.95 | Chad Central African Republic | 58.29 | Chad Central African Republic | 58.14 | Chad Central African Republic | 67.38 | Chad Central African Republic | 68.15 |
| 166  | Chad Central African Republic | 46.86 | Chad Central African Republic | 53.85 | Chad Central African Republic | 53.45 | Chad Central African Republic | 64.11 | Chad Central African Republic | 65.31 |

Table A3. Ranking of the SDG Index Using the POWA Operator.

| Rank | Country           | POWA |
|------|-------------------|------|
| 1    | Sweden            | 92.00|
| 2    | Denmark           | 91.83|
| 3    | Finland           | 91.31|
| 4    | France            | 88.38|
| 5    | Germany           | 88.36|
| 6    | Norway            | 91.31|
| 7    | Austria           | 89.00|
| 8    | Czech Republic    | 88.33|
| 9    | Netherlands       | 89.35|
| 10   | Estonia           | 88.16|
| 11   | Belgium           | 88.27|
| 12   | Slovenia          | 89.00|
| 13   | United Kingdom    | 88.37|
| 14   | Ireland           | 88.25|
| Rank | Country               | POWA |
|------|-----------------------|------|
| 15   | Switzerland           | 89.71|
| 16   | New Zealand           | 88.38|
| 17   | Japan                 | 87.73|
| 18   | Belarus               | 86.00|
| 19   | Croatia               | 84.04|
| 20   | Korea, Rep.           | 87.25|
| 21   | Canada                | 87.20|
| 22   | Spain                 | 86.51|
| 23   | Poland                | 86.11|
| 24   | Latvia                | 87.31|
| 25   | Portugal              | 86.13|
| 26   | Iceland               | 88.81|
| 27   | Slovak Republic       | 84.99|
| 28   | Chile                 | 85.90|
| 29   | Hungary               | 85.40|
| 30   | Italy                 | 85.03|
| 31   | United States         | 86.33|
| 32   | Malta                 | 86.62|
| 33   | Serbia                | 82.84|
| 34   | Cyprus                | 84.53|
| 35   | Costa Rica            | 83.75|
| 36   | Lithuania             | 83.80|
| 37   | Australia             | 86.75|
| 38   | Romania               | 82.39|
| 39   | Bulgaria              | 81.61|
| 40   | Israel                | 85.06|
| 41   | Thailand              | 81.73|
| 42   | Moldova               | 83.52|
| 43   | Greece                | 83.18|
| 44   | Luxembourg            | 85.40|
| 45   | Uruguay               | 83.78|
| 46   | Ecuador               | 83.23|
| 47   | Ukraine               | 84.38|
| 48   | China                 | 82.76|
| 49   | Vietnam               | 83.13|
| 50   | Bosnia and Herzegovina| 82.97|
| 51   | Argentina             | 82.57|
| 52   | Kyrgyz Republic       | 81.77|
| 53   | Brazil                | 81.47|
| 54   | Azerbaijan            | 82.03|
| 55   | Cuba                  | 84.04|
| 56   | Algeria               | 82.68|
| 57   | Russian Federation    | 80.99|
| 58   | Georgia               | 81.38|
| 59   | Iran, Islamic Rep.    | 80.65|
| 60   | Malaysia              | 81.06|
| 61   | Peru                  | 81.77|
| 62   | North Macedonia       | 79.25|
| 63   | Tunisia               | 81.28|
| 64   | Morocco               | 81.15|
| 65   | Kazakhstan            | 79.74|
| 66   | Uzbekistan            | 81.16|
| 67   | Colombia              | 80.46|
| 68   | Albania               | 81.42|
| 69   | Mexico                | 80.83|
| 70   | Turkey                | 81.39|
| 71   | United Arab Emirates  | 80.04|
| 72   | Montenegro            | 82.02|
| 73   | Dominican Republic    | 80.95|
| Rank | Country                | POWA  |
|------|------------------------|-------|
| 74   | Fiji                   | 82.30 |
| 75   | Armenia                | 81.04 |
| 76   | Oman                   | 78.76 |
| 77   | El Salvador            | 80.14 |
| 78   | Tajikistan             | 81.18 |
| 79   | Bolivia                | 78.35 |
| 80   | Bhutan                 | 78.30 |
| 81   | Panama                 | 79.91 |
| 82   | Bahrain                | 79.12 |
| 83   | Egypt, Arab Rep.       | 79.42 |
| 84   | Jamaica                | 78.24 |
| 85   | Nicaragua              | 78.52 |
| 86   | Suriname               | 75.48 |
| 87   | Barbados               | 80.13 |
| 88   | Brunei Darussalam      | 79.71 |
| 89   | Jordan                 | 77.80 |
| 90   | Paraguay               | 77.71 |
| 91   | Maldives               | 80.99 |
| 92   | Cabo Verde             | 76.18 |
| 93   | Singapore              | 83.77 |
| 94   | Sri Lanka              | 79.62 |
| 95   | Lebanon                | 77.10 |
| 96   | Nepal                  | 76.90 |
| 97   | Saudi Arabia           | 76.43 |
| 98   | Trinidad and Tobago    | 76.65 |
| 99   | Philippines            | 75.51 |
| 100  | Ghana                  | 74.85 |
| 101  | Indonesia              | 75.58 |
| 102  | Belize                 | 75.39 |
| 103  | Qatar                  | 76.53 |
| 104  | Myanmar                | 75.21 |
| 105  | Honduras               | 75.47 |
| 106  | Cambodia               | 75.74 |
| 107  | Mongolia               | 73.38 |
| 108  | Mauritius              | 77.57 |
| 109  | Bangladesh             | 74.58 |
| 110  | South Africa           | 73.21 |
| 111  | Gabon                  | 73.53 |
| 112  | Kuwait                 | 74.36 |
| 113  | Iraq                   | 74.85 |
| 114  | Turkmenistan           | 73.07 |
| 115  | Sao Tome and Principe  | 74.12 |
| 116  | Lao PDR                | 74.01 |
| 117  | India                  | 73.76 |
| 118  | Venezuela, RB          | 74.64 |
| 119  | Namibia                | 73.61 |
| 120  | Guatemala              | 74.14 |
| 121  | Botswana               | 71.67 |
| 122  | Vanuatu                | 71.40 |
| 123  | Kenya                  | 70.87 |
| 124  | Guyana                 | 72.02 |
| 125  | Zimbabwe               | 72.74 |
| 126  | Syrian Arab Republic   | 73.30 |
| 127  | Senegal                | 70.04 |
| 128  | Cote d’Ivoire          | 69.57 |
| 129  | Gambia, The            | 72.16 |
| 130  | Mauritania             | 72.19 |
| 131  | Tanzania               | 69.75 |
| 132  | Rwanda                 | 69.23 |
Table A3. Cont.

| Rank | Country             | POWA  |
|------|---------------------|-------|
| 133  | Cameroon            | 68.31 |
| 134  | Pakistan            | 68.66 |
| 135  | Congo, Rep.         | 70.11 |
| 136  | Ethiopia            | 69.02 |
| 137  | Burkina Faso        | 70.65 |
| 138  | Djibouti            | 67.57 |
| 139  | Afghanistan         | 68.74 |
| 140  | Mozambique          | 69.63 |
| 141  | Lesotho             | 70.99 |
| 142  | Uganda              | 66.86 |
| 143  | Burundi             | 68.90 |
| 144  | Eswatini            | 66.58 |
| 145  | Benin               | 68.86 |
| 146  | Comoros             | 64.28 |
| 147  | Togo                | 67.68 |
| 148  | Zambia              | 67.15 |
| 149  | Angola              | 63.55 |
| 150  | Guinea              | 68.70 |
| 151  | Yemen, Rep.         | 69.72 |
| 152  | Malawi              | 66.82 |
| 153  | Sierra Leone        | 67.50 |
| 154  | Haiti               | 65.11 |
| 155  | Papua New Guinea    | 66.13 |
| 156  | Mali                | 67.31 |
| 157  | Niger               | 68.29 |
| 158  | Congo, Dem. Rep.    | 64.46 |
| 159  | Sudan               | 62.86 |
| 160  | Nigeria             | 64.40 |
| 161  | Madagascar          | 65.35 |
| 162  | Liberia             | 64.28 |
| 163  | Somalia             | 62.00 |
| 164  | Chad                | 62.17 |
| 165  | South Sudan         | 63.92 |
| 166  | Central African Republic | 57.52 |

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