Article

National Baselines for Integrated Implementation of an Environmental Sustainable Development Goal Assessed in a New Integrated SDG Index

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Abstract: Most indicator-based assessments of progress on the Sustainable Development Goals (SDGs) focus on identifying priorities for implementation. However, once priorities are established, policymakers are called to implement them in an integrated way which requires progress not just on a Goal's targets (siloed approach) but also progress in interrelated policy areas. To assess baselines for integrated implementation, this article introduces a new family of SDG index based on a Goal's targets and first-order interrelations with other goals that divides targets linked to the prioritized or focal SDG into pressure, impact, and response components. Focusing on an application to SDG14, the conservation and sustainable use of marine resources, an important priority for many small island developing states, the article develops an integrated SDG14 (I-SDG14) index based on an international study of SDG14 interlinkages with indicators selected from SDSN's global indicator set for all island states with sufficient data available for the year 2018. While all island states assessed face challenges on SDG14, top-performers in terms of I-SDG14 (United Kingdom, New Zealand, Japan, Ireland and Iceland) tend to face greater challenges on pressures, primarily reflecting their performance on targets related to SDGs 2, 12, 13 and 15, whereas bottom-performers (Timor-Leste, Vanuatu, Haiti, Jamaica and Comoros) tend to face greater challenges on responses, i.e., country capacities to influence SDG14, owing to their status on targets related to SDGs 4, 9, 16 and 17. In particular, country scoreboards, "traffic-light" visual representation of performance, and radar-diagrams are used to investigate country-level strengths and challenges for integrated implementation. The proposed index offers a useful starting point to frame discussions with different stakeholders around integrated approaches to implementation and can be flexibly applied to other SDGs and contexts. The article concludes with several suggestions for future research aimed at improving integrated assessments for the SDGs.

Keywords: sustainable development; SDGs; integrated assessment; SDG index; interlinkages; SDG14; island states

1. Introduction

To guide national planning and policies for sustainable development, the United Nations Sustainable Development Goals (UN SDGs) offer a broad framework of 17 SDGs and 169 targets spanning a range of sectors such as poverty, health, energy, climate, marine, justice, that is universal in scope, applying to rich and poor countries alike [1,2]. To provide an evidence-based framework for implementation, the UN Inter Agency Expert Group (IAEG) proposed the global indicator set of 232 official indicators [3] and aided by this development, indicator-based assessments, as prime assessors of progress on the SDGs, have become common practice at all scales [4–6].

Most of these assessments focus on evaluating country progress on all SDGs with the aim of identifying performance gaps and informing decision-makers, e.g., politicians, non-specialist media and voters on broad priorities for implementation [6–11]. However, once priorities are established, policymakers are called to implement them in an integrated way which requires accounting for interlinkages typically with a smaller set of other goals and targets [12–14]. For example, it is recognized that conservation and sustainable use of marine resources (SDG14), a key priority for many small island developing states [15–18], has important interactions with poverty reduction (SDG1), food security and nutrition (SDG2), economic growth (SDG8), urban development (SDG11), sustainable consumption and production (SDG12) and climate action (SDG13) [19]. However, despite clear connections, there are few indicator-based tools to support integrated approaches to SDG implementation.

The aim of this article is to develop a monitoring tool that can help to assess national baselines for integrated implementation of an SDG. Specifically, the article uses the SDGs as a framework for the integrated assessment basing indicator selection on scientific evidence of SDG interrelations. Influenced by systems thinking, Niemeijer and de Groot [20] argued that causal networks which capture the full range of causes, effects and interrelations with a particular sustainability issue can be used to select indicators (based on their position within that network) to improve sustainability assessments [20,21]. Specifically, they proposed organizing indicators according to causal-chain frameworks, such as pressure-state-response (PSR), driving force-state-response (DSR) or driving force-pressure-state-impact-response (DPSIR) frameworks, popular in environmental assessment reports [22–24]. In the simplest case, PSR frameworks divide indicators into pressure, state and response indicators based on interrelations between three components: "pressure on the environment from human and economic activities, lead to changes in the state or environmental conditions that may provoke responses by society to change the pressures and state of the environment" [25] (p. 12).

A similar approach can be applied to structure indicators for integrated SDG assessments. To guide the systematic identification of interrelations between SDGs, there is now a large and growing literature that reviews scientific studies and consults with experts to map out the main interlinkages between SDGs [26–28]. These studies start with the question "if progress is made on target *x*, how does this influence progress on target *y*" [27] (p. 536). Many of the studies focus on a single SDG seeking to identify its links to other goals and targets summarizing the full range of bilateral interactions in a table, cross-matrix or network. For example, detailed analyses have been undertaken for SDG2 zero hunger [19], SDG3 health and well-being [19,29], SDG4 education [30], SDG7 affordable and clean energy [19], SDG8 decent work and growth [31], SDG9 industrial innovation and infrastructure [32], SDG13 climate action [33], and SDG14 oceans and seas [19,28,34]. While these analyses do not invoke PSR, DSR or DPSIR frameworks, focusing instead on establishing the sign (synergy or trade-off) and strength (using scales to grade relationships) of each interaction [35–37]. The studies, however, do emphasize the directionality of interactions, resulting in directed graphs, similar to causal networks, since often interactions are unidirectional or bilateral but asymmetric.

Drawing on the indicator selection procedure of Niemeijer and de Groot [20] and studies in sustainability science of SDG linkages, this article proposes a new SDG index (called the I-SDGx index) based on a Goal's targets and main interlinkages with other Goals. To illustrate, the article focuses on an application to SDG14. Several studies have demonstrated the challenges island states face on targets such as tackling marine pollution (14.1), sustainable fishing (14.2), protection of marine areas (14.5) and raising economic benefits from maritime sectors (14.7) [7], and the strong interrelations between this "Oceans Goal" and other goals [19,28,34,38]. According to ICSU [19], SDG14 involves 97 target-level (first-order) interactions with other goals, of which 61 are positive, 1 is neutral and 35 are negative.

Composite indicators are a way to reduce the complexity of these interactions (owing to the many linkages and feedbacks) without dropping the underlying information base with a view to supporting policymakers need for simple communicative messages [39–41]. To incorporate linkages in the selection of indicators for the index, the boundaries of the assessment first need to be defined [20]. In other words, what types of links will be included, and which ones will be excluded. For instance,

how much consideration should be given to first-order and second or higher-order interactions [27], such as the effects on health of lower incomes from marine pollution, and how much comes from vertical linkages, such as interactions of global processes with national performance, such as climate change and localized coral bleaching [42]. In view of the large number of proximate influences on SDG14, this paper restricts assessment to first-order interactions and the within-country situation, focusing on a framework that structures these interactions.

Specifically, the article proposes a PIR framework to group selected indicators in pressure, impact and response components. Pressures (P) refer to targets which may influence the achievement of SDG14, e.g., agricultural intensification may pollute coastal waters, renewable energy expansion can raise economic benefits from maritime sectors. On the other hand, impacts (I) refer to targets potentially influenced by progress on SDG14, e.g., protection of marine areas can result in improved climate resilience, tackling marine pollution can support economic growth. Finally, responses (R) reflect country capacities to change the pressures and achievement of SDG14. These targets may relate to education, science and technology, public sector effectiveness or governance, e.g., inclusive decision-making may improve marine protection effectiveness, marine education can enable sustainable fishing; Information Communication Technology (ICT) use can enhance protection management, among others. This framing facilitates simple communication on the main causal interrelations with SDG14 and country capacities to manage these relations.

The article's main contribution to the literature on SDG monitoring is to propose a new index that could assist with integrated implementation of an SDG. Accounting for interlinkages with other SDGs and reflecting on progress in interlinked policy areas is needed to overcome siloed approaches to implementation that have met with little success in the past [27,43]. Specifically, a sound procedure for indicator selection based on evidence of interlinkages and simple causal framework for structuring interlinked indicators makes for an important management tool for developing coordinated implementation strategies, allocating resources and tracking progress in interrelated policy areas. The attempt at developing an integrated index in this article compliments efforts to measure progress on all SDGs. While these assessments typically focus on identifying priorities for implementation [4,7–9], there are no assessments that take a specific priority, such as SDG14, and provide a baseline integrated assessment, despite the importance of this for many countries. The results should be of interest to different stakeholders as a tool to frame discussions and mobilize efforts around integrating policies and strategies [39,44].

This is not the first paper to develop an integrated SDG index. In a recent article, Biggeri et al. [10] propose an I-SD index based on constant elasticity of substitution functions that aim to capture in a single parameter the degree of synergy or trade-off between and within SDGs. However, their approach does not deal with goal-specific interactions and heterogeneity in links across goals. Neither is this the first article to develop a goal-focused SDG index. Kyncolova, Upadhyaya, Nice [45] develop a composite SDG9 index to measure the extent of inclusive and sustainable industrial development based on a selection of five SDG9 industry-related targets. However, their index does not consider interlinkages with other goals. Indicator-based studies of nexus issues come closest to the approach in this paper (e.g., [46–49]). In these studies, indicator selection is mostly based on perceived interrelations between a small set of policy areas, e.g., water-food-energy nexus, and many of the studies do not develop a composite [46]. The closest article to this one is Nhemachena et al. [47] who develop an agriculture-related SDG index for Southern Africa that identifies eight SDG indicators related to the agricultural sector covering five SDGs (SDGs 1, 2, 6, 7, and 15). However, their index is not based on DPSIR frameworks that group indicators according to evidence on their interrelations.

The article also relates to recent research on integrated environmental management frameworks [50–52]. Increasingly, the integration of SDGs in such frameworks is seen to widen their applicability and support more comprehensive quantitative assessments of sustainability [53–55]. Although still relatively rare, several studies have sought to integrate SDGs in frameworks for coastal and marine management [53,56,57], water [58], smart cities [59], circular economy [60], as well as

spatio-temporal analyses of health [61]. An important theme is identification of a set of key performance indicators [53,62–64]. While these frameworks hold considerable long-term promise for sustainability management, current data availability problems limit their use [65]. This article suggests the SDGs provide a relatively simple yet comprehensive and flexibly applicable intermediate framework, between siloed approaches and fully integrated frameworks, if indicator selection is based on scientific studies of interlinkages with the issues of interest [19,26–37]. Further, the article develops a composite to assess the main SDG pressures, impacts, and capacities. By using SDGs as an integrated framework for assessment, it also compliments recent efforts that apply the SDGs as a framework to assess socio-economic impacts and guide more sustainable planning and policies [66,67].

The remainder of the paper is structured as follows. Section 2 derives an I-SDGx index based on a PIR framework. Section 3 focuses on an application to SDG14. Section 3.1 proposes a four-step procedure for selecting indicators for integrated SDG14 assessments and presents the indicator set for I-SDG14. Section 3.2 classifies selected indicators as pressures, impacts and responses and describes the data and normalization. Section 3.3 presents the results for all island states with sufficient data. Section 4 concludes with discussion of limitations and suggestions for future research.

2. Deriving an I-SDGx Index Based on a PIR Framework

Compared to the SDG index of Sachs and associates which focuses on all SDGs and ignores linkages between them, the index developed in this paper focuses on a single "focal" SDG, called SDGx, e.g., SDG14, and its first-order interlinkages with other goals. To clarify its unique features, the index is based as closely as possible on the SDG index using the same techniques for target value setting, min-max normalization and arithmetic aggregation [4,7,68]. The main differences concern the conceptual framework, indicator selection procedure and weights used for aggregation.

The I-SDGx index has two dimensions: the focal SDG and linked SDGs (Figure 1). The identification of linkages can use existing studies of SDG linkages (e.g. [19]) or apply these methods such as review scientific literature and organize expert consultations [27]. Once interlinkages are identified, the indicator set is derived from selecting the best available official SDG indicator(s) relevant to the focal targets, termed "focal indicators", and identified targets of linked SDGs, called "linkage indicators". Use of official indicators ensures selected indicators meet criteria such as measurability, methodological soundness, target relevancy, comparability, and ease of communication and access [1,68,69]. Based (primarily) on the direction of causality with the focal targets, selected linkage indicators are classified in pressure, impact and response components (Figure 1) (see Section 3.3).

The I-SDGx index is essentially a weighted average of the focal and linkage indicators (Equation (1)), with each indicator normalized for aggregation. To incorporate linkages in the assessment, the weight w assigned to linked SDGs must be strictly positive, i.e., $w > 0$. Whereas to ensure focal targets are part of the assessment, $w < 1$. Within the range 0 to 1, the choice of weight appears arbitrary. In this paper, $w = \frac{1}{2}$ on the basis that SDG14 is the focal point for the assessment.

Equation (2) computes the average score for all linkage indicators. It ensures linkage indicators are equally weighted in the I-SDGx index. Equation (2) also helps to decompose I-SDGx into focal, pressure, impact, and response sub-indices, useful both for analytic purposes and communication with policymakers. In addition, Equation (2) summarizes important information about linkages. It expresses the average score as the weighted average of pressure, impact, and response scores with weights that reflect the share of linkage indicators in each component.

For each sub-index, normalized indicators are aggregated into unique scores using the equally weighted arithmetic mean (Equation (3)). Bi-directional linkages cause some targets to act as both pressures and impacts and consequently, pressure and impact components can overlap, i.e., $P \cap I \neq \phi$. In a PIR framework, dual indicators such as these are double-counted for weighting purposes.

$$ISDGx \; = \; (1-w)\overline{SDGx} + w\overline{L}, \tag{1}$$

where *SDGx* is the focal SDG, *L* is *SDGx*'s set of linkage indicators and overbar denotes the score.

$$\bar{L} = \frac{1}{|L|}\left(|P|\bar{P} + |I|\bar{I} + |R|\bar{R}\right),$$ (2)

|.| counts the number of indicators in the relevant component. *P*, *I* and *R* are respectively the set of pressure, impact and response indicators of *SDGx*.

$$\overline{SDGx} \text{ or } \bar{P} \text{ or } \bar{I} \text{ or } \bar{R} = \frac{1}{n}\sum y_{1,2,\ldots,n},$$ (3)

where *y* is the normalized value of an indicator in *SDGx* or *P* or *I* or *R*, and *n* is the number of indicators in the component.

Dimensions	Weight	Components		
Focal SDG (SDG*x*)	$1 - w$	Targets of SDG*x* (focal indicators are equally weighted)		
Linked SDGs	w	Pressures	Impacts	Responses
		Targets linked to SDG*x* (linkage indicators are equally weighted)		

Figure 1. An integrated Sustainable Development Goal (I-SDGx) index based on a pressure-impact-response framework for dividing targets linked to the focal SDG (SDG*x*).

3. Application to SDG14

3.1. Procedure for Selecting an Indicator Set for an I-SDG14 Index

To construct an indicator set for integrated assessment of SDG14, four main steps are proposed. The method is adapted from Niemeijer and de Groot [20] (pp. 19–21):

(1) Define the focal SDG's targets of interest.
(2) Choose a study area (i.e., a context for assessing progress).
(3) Identify the main first-order within-country interlinkages with the focal targets using a study of SDG linkages.
(4) Select focal and linkage indicators from official SDG indicator sets based on relevancy and availability criteria.

Step 1: Define the SDG targets of interest. Due to data limitations generic to SDG14, this study focused on four targets that together balance the Goal's twin objectives of marine conservation and sustainable use of marine resources. Two targets concern conservation: 14.1. Reducing Marine Pollution and 14.5. Protect Marine Areas; and two focus on sustainable use of marine resources: 14.4. Sustainable Fishing and 14.7 Raising Economic Benefits. Table 1 provides official descriptions for selected targets.

Table 1. Selected SDG14 Targets.

SDG Target	Short Description	Official Description *
14.1	Marine Pollution	By 2025, prevent and significantly reduce marine pollution of all kinds in particular from land-based activities, including marine debris and nutrient pollution.
14.4	Sustainable Fisheries	By 2020, effectively regulate harvesting and end overfishing, illegal, unreported and unregulated fishing and destructive fishing practices and implement science-based management plans, in order to restore fish stocks in the shortest time feasible, at least to levels that can produce maximum sustainable yield as determined by their biological characteristic.
14.5	Marine Protection	By 2020, conserve at least 10 per cent of coastal and marine areas, consistent with national and international law and based on the best available scientific information.
14.7	Economic Benefits	By 2030, increase the economic benefits from the sustainable use of marine resources, including through sustainable management of fisheries, aquaculture and tourism.

* Source: [1].

Step 2: Choose a study area. The paper focuses on island states, i.e., states made up of islands or land masses surrounded by water, owing to the challenges they face on SDG14 [7,15]. In many island states, fishing, aquaculture, and tourism are important contributors to the economy with significant implications for society and environment [16–18].

The sample includes the 39 official UN Small Island Developing States (SIDS). It also includes high-income small island states such as Iceland, Malta, Cyprus, Ireland, Bahrain, New Zealand, Singapore and Brunei Darussalam. There are also several large developing and developed island states, Indonesia, Philippines, United Kingdom, and Japan. Overall, the countries span a diverse range of geographic locations, development levels, population sizes and densities: ranging in population from 270.63 million to 58.14 thousand, in the area from 1910.931 thousand km^2 to 21 km^2 and in per capita income measured in 2017 US dollars (PPP) from \$73,060 to \$517.

Step 3: Identify the main first-order within-country interlinkages based on a study of SDG linkages. The ICSU [19] study was used to provide a broad international assessment of first-order interactions between SDG14 and other goals at a national level [19] (p. 178–182). Two types of linkages were distinguished: the potential influence of progress towards SDG14 on other SDGs achievement and the potential influence of other SDGs on SDG14. Findings of the study are presented in Tables 2 and 3 and briefly described below.

Table 2. Influence of selected marine targets on other SDGs.

Target\SDG	1	2.	3	4	5	6	7	8	9	10	11	12	13	15	16	17
14.1: Marine Pollution	+/−	+	+					+/−		+	+/−		+	+		
14.4. Sustainable Fisheries	+/−	+/−		+	+			+/−							+	+
14.5. Marine Protection	+/−	+/−		+	+			+/−		+/−	+/−		+	+	+	+
14.7: Economic Benefits	+/−	+						+/−	+	+	+					+

Source [19]. Influence on SDG16 and 17 is the author's own assessment.

Table 3. Influence of other SDGs on selected marine targets.

Target\SDG	1	2	3	4	5	6	7	8	9	10	11	12	13	15	16	17
14.1. Marine Pollution	+/−	−		+		+	+	+/−	+/−		+/−	+	+	+	+	+
14.4. Sustainable Fishing	+/−			+			+/−	+/−	+				+		+	+
14.5 Marine Protection	+/−			+			+/−	+/−	+/−		+/−				+	+
14.7. Economic Benefits	+/−			+			+/−	+/−	+		+		+		+	+

Source [19]. Influence of SDG16 and 17 is the author's own assessment.

The influence of SDG14 on other SDGs: The first target of relevance is tackling marine pollution (Target 14.1). Progress on this target helps to provide a sustainable resource base for revenues from fisheries, aquaculture and tourism (SDG8). It also connects to poverty reduction and reducing inequalities, by, for example, raising incomes from fisheries, especially for small-scale fishers, and enabling job creation in tourism and related sectors (SDG1). This can contribute to income growth for low-income groups (SDG10). Tackling marine pollution also helps to improve nutrition (SDG2) and population health and well-being (SDG3). By making coastal areas more attractive for development, it can support sustainable urbanization (SDG11), although trade-offs may occur when reducing pollution constrains such development. Tackling marine pollution can also result in reduced terrestrial biodiversity loss (SDG15).

Sustainable fisheries (Target 14.4) also supports a sustainable resource base for revenues from fisheries (SDG1 & SDG8), and higher sustainable fishing yields can improve food security and nutrition (SDG2). Sustainable practices in fishing may also contribute to higher female labour participation (SDG5), innovation in marine technology (SDG9), natural resource protection and reduced food loss (SDG12). While ending overfishing and illegal fishing may help reduce corruption (SDG16), it can limit options to develop fisheries in poor coastal communities (SDG1), reduce food production and nutrition (SDG2), and restrict job creation and growth in fisheries (SDG8), especially in the short-term.

Protection of marine areas and their ecosystems (Target 14.5) can result in improved resilience of coastal communities to climate change (SDG13), such as the important role of sustainable coastal zone management, e.g., mangroves, seagrass beds, in buffering the impacts of climate change. Marine protection can also enhance fish recruitment and biodiversity in areas adjacent to them (SDG2 and SDG15) and result in new opportunities in terms of livelihoods (SDG1, SDG10) and job creation (SDG8). It also helps to contribute to better ocean governance (SDG17) and typically requires more inclusive decision-making and less corruption (SDG16). However, trade-offs can arise when marine protection restricts access to resources and ecosystem services for the poorest (SDG1), access to food and areas for aquaculture (SDG2), which may contribute to inequality (SDG10). It may also restrict growth in certain sectors (SDG8), e.g., fisheries, renewables, and coastal urbanization (SDG11).

In terms of blue growth, raising economic benefits from sustainable management of maritime sectors (Target 14.7) can support poverty reduction (SGD1), job creation and economic growth (SDG8), and lower inequalities (SDG10), as well as innovation in maritime technology (SDG9), coastal urbanization (SDG11), and public finances (SDG17).

The influence of other SDGs on SDG14: Education (SDG4), science and technology (SDG9), effective public sectors (SDG16), and partnerships for sustainable development (SDG17) are each examples of critical enablers of progress on all four targets. Education (SDG4) includes marine training and awareness programs, improvements in ocean literacy and skilled sustainability professionals on ocean and sea services. Transparent, inclusive, and accountable institutions (SDG16) are generally seen as important requirements for effective public interventions, such as community governance arrangements in many developing countries, e.g., community management and policing of no-catch zones. In addition, digital technology, ocean governance, policy coherence, mobilization of financial resources, and investments in statistical capacity (SDG17) go hand in hand with progress on each of the four targets. Further, investment in science and technology (SDG9) can support marine conservation and sustainable resource management and result in absorption of advances in marine technology.

While economic growth (SDG8) and poverty reduction (SDG1) may create or free-up resources for marine investments, these goals can result in negative effects on ocean health, efforts to reduce overfishing and protect marine areas, and economic benefits from sustainable maritime sectors. Similarly, industrialization and infrastructure development in coastal areas (SDG9) and coastal urbanization (SDG11) can help to raise economic benefits from maritime sectors, however, without proper consideration of pollution on marine and coastal waters, coastal development can also lower ocean health and undermine marine protection. Moreover, nutrient run-off from agricultural intensification (SDG2) and imported biodiversity threats (SDG15) can harm ocean health,

whereas wastewater treatment (SDG6) and protection of terrestrial biodiversity sites (SDG15) may have positive effects. In addition, without management of chemical and household waste (SDG12), waste can severely affect ocean health.

Renewable energy expansion (SDG7), including offshore wind and wave, goes hand in hand with blue economy, but may have negative effects when energy infrastructure results in spatial competition with other uses, e.g., protected areas, fisheries, aquaculture. Finally, climate mitigation (SDG13) can contribute to ocean health and support sustainable fisheries and maritime sectors.

Step 4: Select focal and linkage indicators from official SDG indicator sets based on relevancy and availability. The indicator set for the index was constructed by selecting official SDG indicators relevant to the focal targets (step 1) and targets identified in the analysis of interlinkages (step 3) [69]. Because some official indicators lack internationally established methodology (so-called Tier 3 indicators) or data is not regularly produced (Tier 2 indicators) [69], following Sachs et al. [7], proxy indicators from SDSN's global indicator set were used to broaden the scope of the assessment.

The decision process for selecting indicators followed three steps: step A, if a target (focal or linkage) had a Tier 1 indicator (i.e., the indicator has an internationally established methodology and data are regularly produced in at least 50% of countries globally), this indicator was selected; step B, if the target had a Tier 2 or Tier 3 indicator, a suitable proxy was sought and if available selected; and step C, if no suitable proxy was available, the target was excluded from the assessment.

Table 4 summarizes the complete list of indicators selected from SDSN's Sustainable Development Report 2019 [7]. Where possible, SDSN reports official SDG indicators endorsed by the UN Statistical Commission. Where insufficient standards or data is available for an official indicator and to close data gaps, SDSN includes other metrics from official and unofficial providers [68].

Selection of focal indicators: Following SDSN's approach, the Ocean Health Index's measure of Clean Waters is used as a proxy for marine pollution. For sustainable fisheries and marine protection, official indicators were selected: Fish Stock Status (Indicator 14.4.1) and Marine Protected Areas (Indicator 14.5.1). Fish Stock Status measures the percent of a country's total catch within its Economic Exclusive Zone (EEZ) that comprises fish overexploited or collapsed, whereas marine protected areas refer to the extent of protected area in a country's EEZ divided by its total EEZ.

For economic benefits, the official indicator 14.7.1 is Sustainable Fisheries as a percentage of GDP. This indicator was recently updated to Tier I and the custodian agency, Food and Agriculture Organization (FAO), has not yet published official data [69]. While many countries estimate fisheries contribution to GDP, calculations often involve different methodologies and are not internationally comparable. To facilitate the assessment of Target 14.7, this article introduces a proxy measure "ocean productivity" defined for each country as Total Revenue from Fisheries/EEZ. Data was collected from the Sea Around Us online data portal (seaaroundus.org/data). This indicator uses data on the real 2010 value (US$) of a country's fisheries sectors: artisanal, recreational, subsistence and industrial; based on reported catches by FAO in 2014 and divides this figure by the country's EEZ. It can be interpreted as fisheries revenue per km^2 of EEZ and seen as a measure of a country's ocean productivity, similar to measures of land productivity.

Selection of linkage indicators: Based on Tables 2 and 3, if the ICSU study reported that progress on a goal or target may influence performance on an SDG14 target (or vice versa), the most relevant available indicator(s) related to this goal or target was selected. For instance, to account for potential effects of poverty reduction on overfishing, the national poverty rate was included. Similarly, to account for sustainable fisheries potential role in better nutrition, the percent of the population undernourished and percent obese were included, since healthier diets can affect both subgroups.

Table 4. List of Indicators for I-SDG14.

Dimensions	Component	Policy Area	SDG/Target	Indicator	Target Value	Data Source
Focal SDG	SDG14	Marine	14.1	Ocean Health Index: Clean Waters (0–100)	100	OHI
			14.4	Fish Stocks Overexploited/Collapsed in EEZ (%)	0	FAO/Sea Around Us
			14.5	Marine Protected Areas (% of EEZ)	10	UNEP
			14.7	Fisheries Revenue (US\$ p. km^2 of EEZ)	3500	Sea Around Us
Linked SDGs	Pressures	Poverty	1	Poverty Headcount Ratio at \$3.20/day (%)	0	World Bank
		Agriculture	2	Sustainable Nitrogen Management Index	0	EPI
		Water	5	Anthropogenic wastewater that receives treatment (%)	100	EPI
		Energy	7	Renewable Energy Consumption (as % of Total Energy Consumption)	51.7	World Bank
		Economy	8	Adjusted Growth Rate (%)	5	SDSN
		Infrastructure	9	Logistics performance index: Quality of trade and transport-related infrastructure (1 = Low to 5 = High)	4.25	UNU-IAS
		Urbanization	11	Annual mean concentration of particulate matter of <2.5 microns of diameter ($PM_{2.5}$) in urban areas ($\mu g/m^3$)	6.3	IHME
		Waste	12	Municipal solid waste (kg/day/per capita)	0.1	ILO
		Climate	13	Energy-related CO_2 emissions per capita (tCO_2/capita)	0	EPI
		Biodiversity	15	Imported biodiversity threats (per million population)	0	EPI
	Impacts	Poverty	1	Poverty Headcount Ratio at \$3.20/day (%)	0	World Bank
		Nutrition	2	Prevalence of undernourishment (% pop.)	0	WHO
			2	Prevalence of obesity BMI ≥ 30 (% of adult population)	2.8	WHO
		Health	3	Subjective well-being (10 = High to 0 = Low)	7.6	Gallup
		Gender	5	Female to male labour force participation rate (% female-to-male ratio)	100	ILO
		Economy	8	Adjusted Growth Rate (%)	5	SDSN
			8	Unemployment Rate (%)	0.5	ILO
		Inequality	10	Gini Coefficient for Income (0–100)	27.5	SDSN
		Urbanization	11	Annual mean concentration of particulate matter of <2.5 microns of diameter ($PM_{2.5}$) in urban areas ($\mu g/m^3$)	6.3	IHME
		Climate	13	People affected by climate-related disasters (per 100,000)	0	SDSN
		Biodiversity	15	Red List Index of species survival (0 = Worst to 1 = Best)	1	IUCN

Table 4. *Cont.*

Dimensions	Component	Policy Area	SDG/Target	Indicator	Target Value	Data Source
Linked SDGs	Responses	Education	4	Lower Secondary Completion Rate (%)	100	UNESCO
		Science & Technology	9	Number of scientific and technical journal articles (per 1000 population)	2.2	NSF
		Biodiversity	15	Mean area protected in freshwater sites important to biodiversity (%)	100	IUCN
		Justice	16	Corruption Perception Index (0 = Low to 100 = High)	88.6	Transparency Int.
			16	Freedom of the Press Index (0 = Best to 100 = Worst)	10	Reporters sans frontiers
			16	Seats held by women in national parliaments (%)	50	IPU
		Partnership	17	Government spending on health and education, proportion of GDP (% GDP)	15	World Bank
			17	Population using the internet (%)	100	ITU

Note, indicators selected from SDSN's global indicator set [7]. Selection and PIR classification of indicators is by the author.

Examples of proxy indicators selected include, an urban air pollution indicator is used to proxy for sustainable urbanization on the basis that more sustainable urbanization should have lower environmental footprint. Number of seats held by women in national parliaments proxies for inclusive decision-making. Similarly, press freedom acts as a proxy for quality of institutions. Whereas, government spending on health and education proxies for policy coherence and mobilization of financial resources for sustainable development.

While proxies significantly broadened the assessment's scope, it did not solve all problems of availability. Some identified targets were excluded due to lack of relevant Tier 1 indicators and of suitable proxies in SDSN's indicator set. Examples of such targets (and their official indicators) are reduce food loss (food loss index and food waste index), promote effective partnerships (amount of US$ committed to partnerships), and invest in statistical capacity (proportion of SDG indicators at the national level with full disaggregation) [69].

3.2. Indicator Classification, Data and Normalization

Classification of indicators as pressures, impacts and responses is given in column 2 (Table 4). The direction of influences, positive or negative, reported in Tables 2 and 3 were used respectively to identify eleven impact and ten pressure indicators. Identification of capacity indicators relied on classifications used in the Environmental Sustainability Index [70]. This resulted in eight capacity indicators, spanning education (1), science and technology (1), public sector institutions (3) and governance (3).

Data was collected from SDSN's Sustainable Development Report 2019 [7] for the year 2018 (or most recent available). Due to some countries missing one or more SDG14 data point, case deletion was applied to ten countries, all of them SIDS (these countries are Bahrain, Brunei Darussalam, Belize, Dominica, Grenada, Nauru, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Singapore). SDG14 missing values can affect I-SDG14 results owing to higher weights ascribed to marine targets, i.e., *(1/2)(1/4) = 1/8*. Similarly, for P, I and R components, countries with less than 50% data points in any one component were excluded. This resulted in case deletion of a further five countries, leaving a final sample of 35 countries for the study (these are Antigua and Barbuda, Kiribati, Micronesia, Palau and Tuvalu. It is worth noting that raising the 50% threshold to 60% results in case deletion of 7 countries (a further 2). A total of 11 countries are excluded at a 70% threshold (a further 4) and 16 countries at 80% (a further 5)). A lower threshold for linkage indicators is justified on grounds that I-SDG14 ascribes considerably less weight to individual linkage indicators *(1/2)(1/29) = 1/58*. Specifically, there are 4 focal indicators and 29 linkage indicators. Missing values in this dimension thus tend to exhibit smaller effects. A table of summary statistics for *N* = 35 is given in Appendix A (For *N* = 35, there are no data gaps for SDG14 and the average data gap for P, I and R respectively are 1.57, 1.23 and 0.63. Thus, in this study, the largest gaps appear for pressures and the least for responses.). The dataset (for *N = 35*) is available as Supplementary Material S1.

To make indicators comparable for aggregation, I applied min-max normalization. For each country, each selected indicator was rescaled as an ascending variable from 0 to 100 with 0 denoting the worst performance and 100 describing the best performance (Equation (4)).

$$y = \frac{x - a}{b - a},\tag{4}$$

where *y* is the normalized value; *x* is the observed value; *a* is the minimum value and *b* is the maximum value. To define the "best", target values were computed using methods of the SDG Index and Dashboard Report [7,47] and are reported in column 6 (Table 4). Similarly, "worst" values were selected from SDSN's dataset [7] and are reported in Appendix A. From the Table of Summary Statistics, it can be seen that sample minimums often exceed "worst" values. Rather than deriving "worst" values from sample data, which tended to downplay progress of SIDS (or overstate the depth of challenges) in a sample comprising of SIDS and high-income island states, the selection from global data facilitated a

more accurate assessment of progress in a global context (often resulting in higher scores and grades) without significantly affecting rankings and the main results.

Following Sachs et al. [7], the score of each sub-index (Equation (3)) can be interpreted as the percent achievement of the component's targets given by the (normalized) distance to those targets. The SDG14 score is the percent achievement of the four marine targets, the Pressure score is the percent achievement of the ten pressure targets, etc. The I-SDG14 score itself can be interpreted as the sum of the (sustainability) gaps for each component weighted by the gap's relative importance (see Equations (1) and (2)).

To identify strengths and challenges, a visual representation of component scores in terms of a "traffic light" colour scheme (green = "achieved", yellow = "considerable challenges", orange = "significant challenges", and red = "major challenges") helps to illustrate distance from the best = 100. In contrast to the SDG Index and Dashboard, this article uses an equal-interval classification. If v is the score, the categorization is green ($v \geq 80$), yellow ($80 > v \geq 60$), orange ($60 > v \geq 40$), and red ($v < 40$). Following Glass and Newig [71], differences of 20 points are taken to be considerable.

3.3. Results

To illustrate how I-SDG14 may assist with integrated assessment of SDG14, for the purposes of this article, I have focused on the top-five and bottom-five countries in terms of I-SDG14 (Table 5). I-SDG14 scores and ranks for all island states assessed are reported in Appendix B.

Table 5. I-SDG14 Index: Scores and Rankings for Island States ($N = 35$).

Country	ABN	SDG14 Score	Rank	Pressure Score	Rank	Impact Score	Rank	Response Score	Rank	I-SDG14 Score	Rank
Weighting		1/2		10/58		11/58		8/58		1	
Top five countries											
United Kingdom	GBR	81	1	67	3	78	4	80	1	78	1
New Zealand	NZL	60	4	62	5	75	6	80	3	66	2
Japan	JPN	60	3	60	7	80	3	68	6	65	3
Ireland	IRL	56	5	56	14	84	2	76	4	64	4
Iceland	ISL	42	11	67	2	86	1	80	2	60	5
Bottom five countries											
Timor-Leste	TLS	34	20	31	35	53	29	42	23	38	31
Vanuatu	VUT	27	29	49	23	51	31	25	33	36	32
Haiti	HTI	27	30	55	15	40	35	22	35	34	33
Jamaica	JAM	13	35	53	16	62	17	48	17	34	34
Comoros	COM	20	33	51	20	54	27	28	30	33	35

Author's own calculations. For score v, green = "achieved" ($v \geq 80$), yellow = "considerable challenges" ($80 > v \geq 60$), orange = "significant challenges" ($60 > v \geq 40$), and red "major challenges" ($v < 40$).

The United Kingdom, New Zealand, Japan, Ireland and Iceland emerged as the top-five countries. Apart from the UK, these countries face considerable (NZ, JPN) or significant challenges (IRL, ISL) on SDG14 implementation. The UK is the only country with a high achievement (81% of marine targets achieved). The others range from a minimum achievement of 42% (ISL) to a maximum of 60% (NZ, JPN). IRL's achievement is a modest 56%.

Turning to integrated assessment, the top-five face considerable challenges on integrated implementation (signified in yellow). They owe their high rank among island states primarily to their high scores on impacts and responses. While the impact scores range from 75% to 86% and response scores from 68% to 80%, indicating some room for improvement, considerable challenges

emerge on marine pressures in all five countries. In IRL, these challenges are significant. The highest score is UK and ISL (67% of pressure targets achieved) and lowest is IRL (56%).

On the other hand, Timor-Leste, Vanuatu, Haiti, Jamaica, and Comoros came out as the bottom-five countries. These low-income (VUT, HTI, COM) and middle-income (TLS, JAM) developing countries are from the Caribbean, Asia Pacific, and African east coast. These countries face major challenges (signified in red) on marine performance. Performance ranges from a minimum achievement of 13% (JAM) to a maximum of 34% (TLS). In addition, all five face major challenges on the integrated implementation of SDG14 (displayed in red). While the bottom-five tend to perform relatively better on pressures and impacts (signified in orange), greater challenges tend to be seen on country capacities (relatively lower scores) especially for low-income countries (highlighted in red). Percent achievement of pressure targets ranges from 22% (HTI) to 48% (JAM), with this range being 22–28% for the three low-income countries, whereas the ranges for all five on impacts and pressures are respectively 44–62% and 31–55%.

To identify where efforts might be needed, useful representation of country performance against each target is provided by radar diagrams, (Figures 2 and 3). The amoeba is produced using normalized values for each indicator. The higher the distance from the centre the higher the country's performance for that indicator.
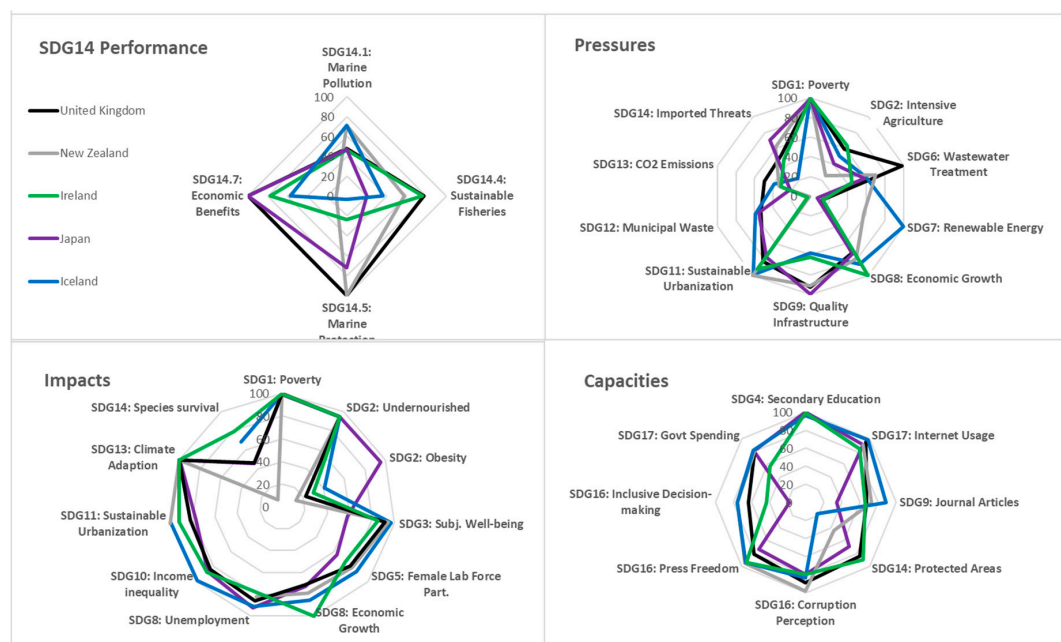

Figure 2. Radar diagrams of I-SDG14 index components for the top-five performing island states in 2018 (or most recent available).

For the top-five (Figure 2), clear gaps in marine performance (top-left panel) can be seen in all five countries on marine pollution and sustainable fishing. While they tend to perform well on economic benefits and marine protection, considerable differences in performance are also apparent. For example, significant challenges are evident in ISL and major challenges in NZ on raising economic benefits. Similarly, ISL and IRL face major challenges on the protection of marine areas.

In terms of integrated assessment, focusing first on pressures (top-right panel), it can be seen from the radar-diagram that the top-five tend to face major challenges on emissions, significant challenges on municipal waste, and challenges ranging from major to considerable on intensive agriculture and imported biodiversity threats. While some perform well on wastewater treatment (UK, NZ), renewable energy (ISL, NZ) and infrastructure (JPN, UK, NZ), the others do not. According to the analysis of SDG14 interlinkages (Table 3), all of these pressures can contribute to poor performance on marine

pollution. Second, in terms of responses (bottom-right panel), it is evident from this radar-diagram that the top-five have well-developed capacities, particularly in education, digital technology, press freedom (proxy for quality of institutions) and low corruption, however, challenges remain for most of these countries on science and technology, inclusive decision-making, and public spending (policy coherence and mobilization of financial resources) for sustainable development. These challenges if unaddressed may weaken capacities to improve marine performance on sustainable fishing and ocean health (Table 3). Third, on impacts (bottom-left panel), progress on SDG14 could contribute to better performance on several other SDGs. According to the radar diagram, there is scope to improve performance in areas such as obesity, gender equality, growth and employment, and biodiversity. From Table 2, progress on SDG14 could help to reduce obesity through, for example, better fish-based nutrition, lower gender inequalities by integrating sustainable practices in fishing (e.g., higher female labour participation), raise growth and employment in coastal areas (e.g., by the development of maritime sectors), and protect biodiversity.

An almost diametrically opposite picture emerges for the bottom-five countries (Figure 3). Clear gaps emerge on marine performance for economic benefits and marine protection (top-left panel). While some of these countries perform well on ocean health (VUT) and sustainable fishing (TLS, HTI, COM, VUT), the others display major challenges on these marine targets as well.
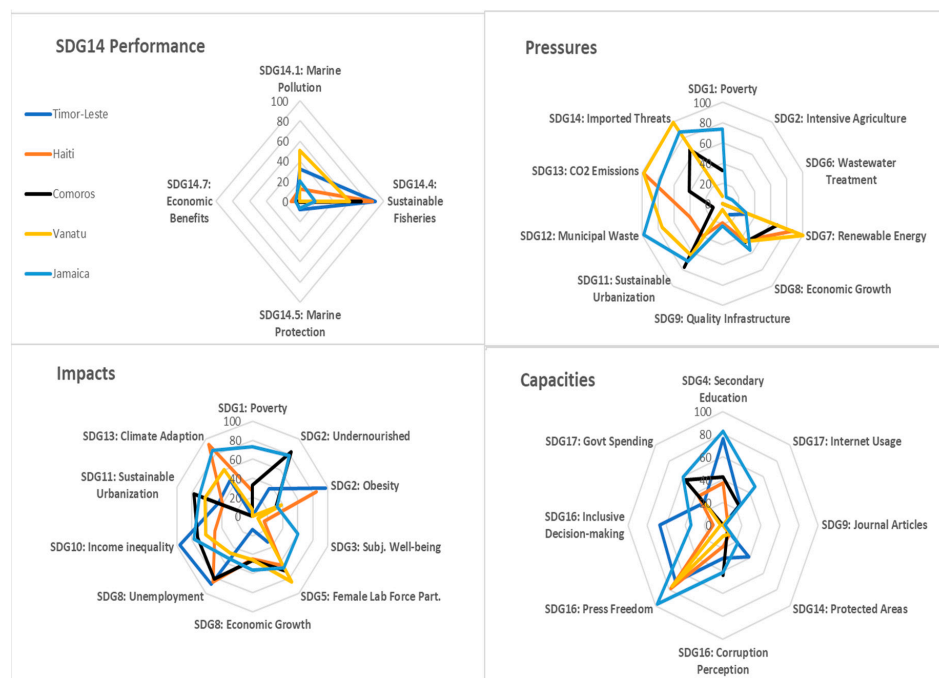

Figure 3. Radar diagrams of I-SDG14 index components for the bottom-five performing island states in 2018 (or most recent available).

In terms of pressures (top-right panel), the bottom-five tend to face significant challenges from weak growth, and major challenges from poverty and poor infrastructure, which can undermine performance on all four marine targets (Table 3). In addition, major challenges are also evident on unsustainable agriculture and wastewater treatment, whereas challenges on municipal waste range from considerable (JAM, HTI) to major (COM, VUT), all of which are additional sources of marine pollution (Table 3). Possibly owing to low development, the bottom-five tend to face lower pressures from imported biodiversity threats and domestic emissions. Better marine performance could improve impacts in several areas (bottom-left panel), such as contributing to poverty reduction, better health, stronger growth and less income inequality, and perhaps also help to reduce gender inequalities and terrestrial biodiversity loss (see Table 2). Greatest challenges appear on capacities (bottom-right

panel) particularly among low-income countries (VUT, HTI, COM). While progress can be seen in the middle-income countries (JAM, TLS) on education, internet usage and quality of institutions, challenges ranging from significant to major tend to be associated with corruption, government spending (policy coherence and mobilization of finance), inclusive decision-making, science and technological capacity, and terrestrial biodiversity protection. Weak capacities such as these can pose significant obstacles to marine performance (Table 3).

4. Conclusions

The SDGs have renewed interest among academics and policymakers in the priorities and interlinkages of sustainable development. To support integrated approaches to implementation, this article proposed a new index based on a framework that organizes goals linked to a priority or focal SDG in pressure, impact, and response components that can help to assess national baselines for integrated implementation. Focusing for illustrative purposes on SDG14 and its interrelations with other SDGs, the article developed an I-SDG14 index based on a study of SDG14 interlinkages and used this index to provide a snapshot of island states capacities, strengths, and challenges for integrated implementation of SDG14. While all island states assessed face challenges on SDG14 and its integrated implementation, the highest-scoring countries in terms of I-SDG14 (UK, New Zealand, Japan, Ireland, and Iceland) tend to perform well on impacts and responses, yet show challenges ranging from considerable to significant on pressures, primarily reflecting their status on targets related to SDGs 2, 12, 13 and 15. On the other hand, the lowest-scoring countries (Timor-Leste, Vanuatu, Haiti, Jamaica and Comoros) tend to show significant challenges on pressures and impacts, and major challenges or relatively lower scores on capacities to influence SDG14, especially on targets related to SDGs 4, 9, 16 and 17.

By summarizing findings in-country scoreboards and radar-diagrams, the proposed index offers a boundary object to frame discussions on how to implement priorities in a more integrated way. However, several limitations associated with the approach are worth noting. First, the index developed in this article did not consider the relative importance of different targets which could have a crucial bearing on the assessment. In particular, future studies should seek to account for evidence on degrees of synergy or trade-off between areas and the potential role of context in shaping interactions [36–38]. Second, as a framework for integrated assessment, the SDGs could result in the exclusion of relevant factors. For example, despite their impact on sustainability in island states, they contain no specific targets on debt and inflation. While debt or inflationary problems can be expected to have discernible impacts on growth and unemployment, the example points to an important limitation with integrated SDG indices. Third, the assessment was limited to the national-level and within-country interlinkages, yet linkages across countries and with global processes and subnational levels are also important [7,42]. Fourth, this article considers a single focal SDG, however, recent systemic approaches to SDG implementation tend to emphasize grouping priorities (targets) from different goals in systems and call for coordinated implementation of "systemic" targets [43,72,73]. Future research should seek to develop integrated indices for systemic transformations given its increasing importance for policy [43,74].

Although the article focused on an application to SDG14 and island states, the index can be readily applied to other SDGs and contexts. Studies of interlinkages for other goals exist (or can be conducted) and required data is publicly available in online portals. In particular, the studies show that interlinkages differ across SDG [19], and therefore should result in different integrated assessments. Interesting applications might include, an I-SDG7 index for integrated assessment of progress on universal and sustainable energy to provide a snapshot of country pressures, impacts and capacities in sub-Saharan Africa, an I-SDG13 for integrated assessment of baselines in EU-25 on climate action or I-SDG3 for integrated assessment of progress in Latin America on universal health and well-being.

Future research can improve the index in several ways. Better assessments could be obtained by addressing data gaps and indicators' relevancy [75,76], use of more fine-grained SDG interaction frameworks [36,37], estimates of synergies and trade-offs [77] and weighting schemes that reflect

indicators importance [78]. In addition, the methodology for indicator selection presented in this article can be improved (see, e.g., [53]). Future research could also seek to account for higher-order interactions using network tools [27], and for interrelations across countries, such as transnational spillovers [7] and linkages with global processes [42]. Another avenue is to use the framework to improve the cooperative structure for sustainable development [2,79–84], by assigning targets to government ministries and societal stakeholders based on their responsibilities to enable policy coherence and better partnerships for implementing priority SDGs.

Appendix A

Table A1. Summary Statistics for All Island States Assessed (*N* = 35).

Component	SDG/ Target	Indicator	Min	Max	Mean	Standard Deviation	Missing Values	Worst Values
SDG14	14.1	Ocean Health Index: Clean Waters (0–100)	36.7	91.4	61.1	13.1	0	28.6
	14.4	Fish Stocks Status (%)	1.1	74	32.5	19.9	0	90.7
	14.5	Marine Protected Areas (% of EEZ)	0	29.7	2.8	6	0	0
	14.7	Fisheries Revenue (US$ p. km^2 of EEZ)	2.6	11,179	1009	2066	0	0
Pressures	1	Poverty Headcount Ratio at $3.20/day (%)	0	92.5	22.5	26.3	3	51.5
	2	Sustainable Nitrogen Management Index	0.4	1.3	0.9	0.3	21	1.2
	5	Anthropogenic wastewater treatment (%)	0	100	21.1	31.4	9	0
	7	Renewable Energy Consumption (% of TEC)	0.3	86.9	28	24.5	0	2.7
	8	Adjusted Growth Rate (%)	−12	7.2	−2.1	3.4	2	−14.7
	9	Logistics performance index (1 = Low 5 = High)	1.8	4.2	2.6	0.7	9	1.8
	11	$PM_{2.5}$ air quality in urban areas ($\mu g/m^3$)	6	34.8	16.3	6.9	0	29.8
	12	Municipal solid waste (kg/day/per capita)	0.2	5.3	2.2	1.5	5	3.7
	13	Energy-related tCO_2 emissions per capita	0.1	30.2	3.9	5.2	0	11.4
	15	Imported biodiversity threats (per million pop)	0.3	140.2	13.7	25.8	6	26.4
Impacts	1	Poverty Headcount Ratio at $3.20/day (%)	0	92.5	22.5	26.3	3	51.5
	2	Prevalence of undernourishment (% pop.)	2.5	45.8	10.5	11.3	6	42.3
	2	Prevalence obesity BMI ≥ 30 (% adult pop.)	3.8	52.9	20.9	12.4	0	35.1
	3	Subjective well-being (10 = High to 0 = Low)	3.6	7.5	5.8	1.2	16	3.3
	5	Female to male labour force participation rate %	47.3	97.4	71.4	13.9	2	21.5
	8	Adjusted Growth Rate (%)	−12	7.2	−2.1	3.4	2	−14.7
	8	Unemployment Rate (%)	1.2	13.9	6.2	3.7	2	25.9
	10	Gini Coefficient for Income (0–100)	27.8	57.6	38.9	6.9	6	63
	11	$PM_{2.5}$ air quality in urban areas ($\mu g/m3$)	6	34.8	16.3	6.9	0	29.8
	13	People affected by climate-related disasters (per 100,000)	0	29,287	6578	8555	6	18,000
	15	Red List Index of species survival (0 = Low 1 = High)	0.4	1	0.8	0.1	0	0.6

Table A1. *Cont.*

Component	SDG/ Target	Indicator	Min	Max	Mean	Standard Deviation	Missing Values	Worst Values
Responses	4	Lower Secondary Completion Rate (%)	36.1	133.8	84.1	22.7	3	18
	9	Number of scientific and technical journal articles (per 1000 population)	0	2	0.3	0.5	0	0
	15	Mean area protected in freshwater sites important to biodiversity (%)	0	99.4	35.5	27.7	1	4.6
	16	Corruption Perception Index (0 = Worst 100 = Best)	16	87	47.8	18.6	4	13
	16	Freedom of the Press Index (0 = Low 100 = High)	11.3	68.9	27.1	11.4	6	80
	16	Seats held by women in national parliaments (%)	0	53.2	18.5	12.3	0	1.2
	17	Government spending on health and education, proportion of GDP (% GDP)	2.3	14.2	8	3.4	8	0
	17	Population using the internet (%)	3.9	98.3	50.8	28.1	0	2.2

Appendix B

Table A2. I-SDG14 Index: Scores and Rankings for Island States Assessed (*N* = 35).

Country	ABN	SDG14 Score	Rank	Pressure Score	Rank	Impact Score	Rank	Response Score	Rank	I-SDG14 Score	Rank
United Kingdom	GBR	81	1	67	3	78	4	80	1	78	1
New Zealand	NZL	60	4	62	5	75	6	80	3	66	2
Japan	JPN	60	3	60	7	80	3	68	6	65	3
Ireland	IRL	56	5	56	14	84	2	76	4	64	4
Iceland	ISL	42	11	67	2	86	1	80	2	60	5
Malta	MLT	46	8	61	6	76	5	67	7	57	6
Dominican Republic	DOM	51	6	59	9	63	16	61	10	56	7
Indonesia	IDN	51	7	60	8	68	11	38	25	54	8
Guinea-Bissau	GNB	66	2	35	31	55	25	26	32	53	9
Samoa	WSM	40	12	73	1	66	13	48	18	52	10
Sri Lanka	LKA	43	10	57	12	63	15	38	26	48	11
Philippines	PHL	39	13	58	11	63	14	44	20	47	12
Fiji	FJI	38	14	58	10	55	26	51	15	46	13
Suriname	SUR	44	9	44	25	51	32	45	19	45	14
Maldives	MDV	29	28	56	13	73	8	44	22	44	15
Cuba	CUB	31	25	43	27	57	23	64	8	42	16
Bahamas, The	BHS	31	24	44	26	59	21	60	11	42	17
Cabo Verde	CPV	29	26	52	19	57	24	55	12	42	18
Papua New Guinea	PNG	25	31	67	4	72	9	24	34	41	19
Madagascar	MDG	34	18	53	17	60	19	27	31	41	20
Guyana	GUY	35	15	35	32	57	22	50	16	41	21
Trinidad and Tobago	TTO	32	21	34	33	62	18	54	13	41	22
Cyprus	CYP	17	34	50	21	74	7	74	5	41	23
Sao Tome and Principe	STP	34	17	49	22	49	33	41	24	41	24
Mauritius	MUS	29	27	42	29	67	12	44	21	40	25
Barbados	BRB	23	32	42	30	71	10	61	9	40	26

Table A2. *Cont.*

Country	ABN	SDG14 Score	Rank	Pressure Score	Rank	Impact Score	Rank	Response Score	Rank	I-SDG14 Score	Rank
Tonga	TON	32	23	52	18	53	30	36	28	40	27
Solomon Islands	SLB	34	19	42	28	59	20	32	29	40	28
Marshall Islands	MHL	35	16	46	24	44	34	36	27	39	29
Seychelles	SYC	32	22	33	34	53	28	52	14	39	30
Timor-Leste	TLS	34	20	31	35	53	29	42	23	38	31
Vanuatu	VUT	27	29	49	23	51	31	25	33	36	32
Haiti	HTI	27	30	55	15	40	35	22	35	34	33
Jamaica	JAM	13	35	53	16	62	17	48	17	34	34
Comoros	COM	20	33	51	20	54	27	28	30	33	35

Author's own calculations. For score *v*, green = "achieved" (*v* ≥ 80), yellow = "considerable challenges" (80 > *v* ≥ 60), orange = "significant challenges" (60 > *v* ≥ 40), and red = "major challenges" (*v* < 40).

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