Assessing the progress of insular areas in relation to the Sustainable Development Goals (SDGs): The case of six isolated Greek islands

CHALASTANI V.I.[1], VENIOU M.[1] and TSOUKALA V.K.[1]

[1]Laboratory of Harbour Works, Department of Water Resources and Environmental Engineering, School of Civil Engineering, National Technical University of Athens (NTUA), Zografou 15780, Greece

*corresponding author: CHALASTANI V.I.
e-mail: vanesachala@hotmail.com

Abstract The Sustainable Development Goals (SDGs) localisation describes the complex process of translating the 2030 Agenda for Sustainable Development within the local context and challenges, defining, implementing and monitoring local actions and strategies that contribute to the global achievement of the SDGs. This article seeks to address this issue by assessing the progress of six isolated Greek islands towards achieving SDGs, namely the islands of Karpathos, Chalki, Tilos, Symi, Kasos and Megisti (Kastellorizo), through the quantification of relevant indicators. In an attempt to perceive the effect of insularity in achieving SDGs, the islands' progress regarding selected goals is compared to the one of areas found in the Greek mainland and have similar characteristics to the islands in terms of population and distance from the country's capital, Athens.

Keywords: SDGs, Insularity, Islands, Indicators

1. Introduction

In 2015, global leaders agreed upon a common vision for sustainable development through the Agenda 2030 with its 17 SDGs and 169 targets to be achieved. The adoption of this framework constitutes a driver for realizing and mainstreaming sustainability throughout the UN system as a whole. These goals and targets were adopted at the national level, although the integration of SDGs within sub-national level planning is a crucial action in implementing Agenda 2030 (Mangukiya and Sklarew. 2023). Thus, localizing the SDGs can not only provide a framework for local sustainable development policy, but also assist local communities to develop local solutions for global problems. The issue of localization of the SDGs is still at its infancy, since the UN targets need adjustment to reflect local conditions and aspirations. Furthermore, challenges are increased in achieving SDGs when vulnerable geographical contexts are considered, such as insular regions of particular natural and geographical impediments. Therefore, assessing the SDGs progress of isolated insular areas seems to be the first step for undertaking meaningful local initiatives that contribute to achieving SDGs.

2. Material/ Methods

2.1. Case study

The six selected islands are located in the geopolitically crucial southeastern part of the Aegean Sea and belong to the prefecture of Dodecanese. They differ in size from Karpathos being the largest in both area and population and Megisti being the smallest. The areas of the mainland chosen to be compared with the islands of Karpathos, Symi, Kasos, Tilos, Megisti and Chalki were the municipalities of Amphipolis, Paranesti, Nestorio Prespes, Korestia and Souli respectively. These areas were selected based on their distance from the capital of Greece, Athens as well as their population characteristics, to approximately fit the islands' distance and demographics.

2.2. Indicators' selection

To develop the list of indicators, a series of relevant indicators' databases were carefully scrutinized to select already existing indicators and develop new ones when necessary. In particular, the indicators of the 2030 Agenda, the UN SDGs report (2022), the European Sustainable Development Report (2021), the SDSN Sustainable Development Report, the ESPON's SDG localising tool and the national indicators for Sustainable Development from the Hellenic Statistical Service, Greece's Voluntary Report (VLR) of 2022, as well as multiple other VLRs (e.g., Skiathos VLR 2020, Sultanbeyli VLR 2021) were all examined. The final indicators' selection was based on the relevance of the indicator to the goal and the availability of accurate data to quantify the indicator. For the quantification of the indicators, the SDSN methodology was followed, consisting of four (4) steps: (i) the establishment of upper and lower bounds for the values of each indicator, (ii) the normalization of the values, (iii) the development of a five-colour scale to describe the values, and (iv) the aggregation of indicators' scores for each area through the average of the normalised values.

Table 2. List of indicators developed in this research work.

SDG ID	SDG name	Indicator ID	Indicator name	Expression	Unit
	End poverty in all its forms everywhere	1.1	People at risk of poverty or social exclusion according to national definitions	Number of taxpayers living in poverty/Total taxpayers	%
		1.2	Privately-owned housing	Number of privately-owned households where the owner(s) live(s)/Total number of households	%
	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	2.1	Family-owned vegetable gardens	Total area of family-owned vegetable gardens	(ha)
		2.2	Domestic animals	Number of animal (cattle, sheep, poultry, beehives) farms	(ha)
	Ensure healthy lives and promote well-being for all at all ages	3.1	Type of healthcare unit	None; regional clinic; healthcare center; general center	[0-1]
		3.2	Access to pharmaceutical care	Number of pharmacies/Total population	%
	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all	4.1	Level of education	Number of residents not enrolled in secondary education/Total population	%
		4.2	Type of primary school	Primary school with less than 6 classes or 6 classes	[0,1]
	Achieve gender equality and empower all women and girls	5.1	Economically inactive women	Number of economically inactive women of working age/Total economically inactive population of working age	%
		5.2	Women representation in local authorities	Number of seats held by women in local governments/Total number of seats	%
	Ensure availability and sustainable management of water and sanitation for all	6.1	Access to sanitary facilities	Number of households with sanitary facilities located outdoors/Total number of households	%
		6.2	Access to clean and free water	Is the water in the area potable and free (No/Yes)?	[0,1]
		6.3	Access to safe waste management facilities	Is there a wastewater treatment plant in the area (No/Yes)?	[0,1]
	Ensure access to affordable, reliable, sustainable and modern energy for all	7.1	Access to heating facilities	Number of households without central or any kind of heating facilities/Total number of households	%
		7.2a	Fuel and heating fuel prices	Gasoline price at the petrol station	[€/l]
		7.2b		Heating oil price at the petrol station	[€/l]
	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	8.1	Level of unemployment	Number of unemployed population/Total population	%
		8.2	GPD	GPD per capita	[€]
		8.3	Access to bank services	Number of bank facilities	[0-1]

SDG ID	SDG name	Indicator ID	Indicator name	Expression	Unit
9 Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation		9.1	Internet access	Number of households without internet access/Total households	%
		9.2	Access to safe road network	Length of main road/Total area	[km/km^2]
10 Reduce inequality within and among countries		10.1	Level of isolation	Accessibility index (Virtual Distance)/(Real Distance)	-
		10.2	Representation in national government	Number of seats in national government/ Total number of seats	%
11 Make cities and human settlements inclusive, safe, resilient and sustainable		11.1	Protection against fire	Is there a fire station or brigade in the area (No/Yes)?	[0,1]
		11.2	Cultural heritage	Is there a traditional settlement (No/Yes)?	[0,1]
12 Ensure sustainable consumption and production patterns		12.1	Waste	Total municipal solid waste/ Total number of residents	[kg/residents]
		12.2	Recycling	Recycling schemes (none, disposal, transfer, recycling facilities)	[0-1]
13 Take urgent action to combat climate change and its impacts		13.1	Climate change action	Is there a regional climate change mitigation and adaptation plan (No/Yes)	[0,1]
		13.2	Drought	Number of days of increased fire risk/Number of days per year	%
14 Conserve and sustainably use the oceans, seas and marine resources for sustainable development		14.1	Marine protected areas	Marine area of NATURA 2000 network/ Total marine area	%
		14.2	Fisheries	Number of fishermen/Total number of economically active population	%
15 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss		15.1	Forests	Forest area/ Total area	%
		15.2	Terrestrial protected areas	Terrestrial area of NATURA 2000 network/ Total terrestrial area	%
16 Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels		16.1	Participation in public processes	Number of voters in the last elections/Total population	%
17 Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development		17.1	National funding	Dedicated amount from national funding to upgrade infrastructure	[€]

3. Results

The indicators selected to assess the progress of all the 12 areas considered in the context of this article are presented in Table 2. The performance of the areas is shown in Figure 1. As far as it concerns the first comparison between Karpathos and the municipality of Amphipolis, Karpathos scores higher than Amphipolis in SDGs 8 and 9, whereas Amphipolis scores better in SDGs 1,6 and 7. A greater discrepancy is observed in the comparison between the island of Symi and the municipality of Paranesti. Symi ranks higher in SDG 8 while Paranesti is ahead in SDGs 1, 2, 6, 7, 15 and 17. The island of Kasos scores very low in almost all SDGs with respect to the scores of the municipality of Nestorio. Slightly better results are observed for the island of Tilos, which has achieved higher scores in SDGs 5 and 12, with respect to the municipality of Prepses. A similar pattern is shown for the island of Megisti, which outreached the municipality of Korestia only in two out of the 17 SDGs. Finally, the island of Chalki scores higher only in SDG 5 when compared to and the municipality of Souli. Overall, all regions face serious challenges in meeting the UN SDGs, mainly due to their remoteness. The insular areas have lower scores in achieving the SDGs when compared to the areas of the mainland. The main issues for the islands are related to SDGs 3, 6, 7, 12 and 13. Indeed the access to fully equipped health facilities, potable and free water are issues already identified as problems for the isolated insular areas. However, recent initiatives related to renewable energy and recycling are not considered due to the lack of available data, which would affect the scores of SDGs 7 and 12. On the other hand, the areas of the mainland score very low in SDGs 8, mainly due to the increased GPD of the islands due to touristic activities, and 9 due to the limited access to modern infrastructure.

SDG	Karpathos	Symi	Kasos	Tilos	Megisti	Chalki	Amphipolis	Paranesti	Nestorio	Prespes	Korestia	Souli
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
15												
16												
17												

Figure 1. Performance of each area considered towards achieving SDGs (red-very low, orange-low, yelloow-moderate, light green-high, green-very high).

References

Koundouri, P., Devves, S. and Plataniotis, A. (2021), Alignment of the European green deal, the sustainable development goals and the European semester process: Method and application, *Theoretical economics letters*, **11**(04), 743–770.

Mangukiya, RD and Sklarew DM. (2023), Analyzing three pillars of sustainable development goals at sub-national scales within the USA, *World Development Sustainability, **2**,* 100058.

Markianidou, P. et al. (2021), SDG localising tool: Localising and measuring Sustainable Development Goals in cities and regions, Available at: https://www.espon.eu/sites/default/files/attachments/SDG (Accessed: May 11, 2023).

Lafortune, G., Fuller, G., Bermont Diaz, L., Kloke-Lesch, A., Koundouri, P., Riccaboni, A. (2022), Achieving the SDGs: Europe's Compass in a Multipolar World. Europe Sustainable Development Report 2022, *SDSN and SDSN Europe*, France: Paris.