

Where are the small island states? Raising their visibility through vignettes on global maps

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Abstract:

Small islands are globally distributed in the Caribbean, the Pacific, Atlantic and Indian Ocean and the South China Sea, not to mention those found in the polar regions. Islands are facing sustainability challenges decades ahead of the rest of the continental world. Factors that exacerbate their sustainability challenges include small land areas, limited natural resources, diverse and complicated colonial histories, remoteness, economic reliance on external markets (often tourism), and population concentration along coasts (Rattner 2018). Small islands contribute the least to anthropogenic forcing of climate change, yet are the first to feel the negative effects due to these vulnerabilities (Nurse & Moore, 2005). Due to these challenges, they are also the first to find creative and appropriate sustainability solutions. Islands are knowledge leaders in climate change adaptation and resilience and sustainability hubs for innovation (Ratter, 2018; Singh et al., 2020).

The United Nations (UN) Office of the High Representative for the Least Developed Countries (LDCs), Landlocked Developing Countries and Small Island Developing States (SIDS) (UN-OHRLLS) mobilizes international support and advocates for these 92 vulnerable states. Amongst others, UN-OHRLLS manages a process for countries graduating out of the LDC category (UN-OHRLLS, 2024). Raising global awareness of the sustainable development successes, challenges and potential on small islands is essential. Maps illuminate spatial trends in achieving sustainable development (Kraak et al., 2020), yet, on a global map of the world, SIDS are barely visible. The choice of projection and central meridian, as well as representing islands as point symbols of equal size, can improve the visibility of small islands at a global scale (Gosling-Goldsmith, Ricker & Kraak, 2020). However, such symbols hide the comparative size of islands and that some SIDS are an archipelago of many small islands. Therefore, more design choices need to be explored. In this study, we selected vignettes because they have been found to be effective for guiding map readers' eyes towards map focal points (Franke and Schweikart, 2017). A vignette gives the impression that the feature is glowing, sometimes referred to as a "firefly". We recognize that design choices depend heavily on the intended print size and publication medium and communication aims. In this study, we followed design choices for highlighting islands that we consider to be uniform in cartography, regardless of the size or presentation medium: projection, central meridian and a unique visual effect to highlight islands using a modified vignette/firefly inspired effect.

To draw attention to sustainable development trends in SIDS and to test these visual variables, we selected the United Nations Sustainable Development Goals (SDG) indicator related to renewable energy (SDG 7.b.1). This indicator is useful for first level decision making, e.g., when investors compare green energy solutions per country before delving into country specifics. Two global thematic maps were prepared (see Figure 1, an example of one of them), using QGIS (<https://qgis.org/>) to reproject the Global Administrative Unit Layer (GAUL) (Franceschini et al. 2025) to the Goode Homolosine Ocean projection (EPSG:54053), recommended by Gosling-Goldsmith, Ricker & Kraak (2020) and guided by their tool (gip-itc-universitytwente.github.io/SIDS/). As SIDS are the focal point of the map, vignettes were created around the 57 official SIDS (in millimeters for size A0 paper size). The central meridian of the projection was set to - 79° to minimize the interruptions and stretching of continents and to avoid interrupting SIDS regions. This combination of reprojection and central meridian shift led to technical problems in QGIS with the polygon boundaries at the edges of the globe, requiring a post-production clean-up using Adobe Illustrator and the MaPublisher plugin (<https://www.avenza.com/mapublisher/>). Adobe Illustrator and MaPublisher were also used for the design stage. We selected colours based on the official SDG colour palette (<https://sdgs.un.org/goals>), creating a strong visual link to other SDG graphical products. Other design elements (fonts etc.) were chosen to match the UN design style, where possible.

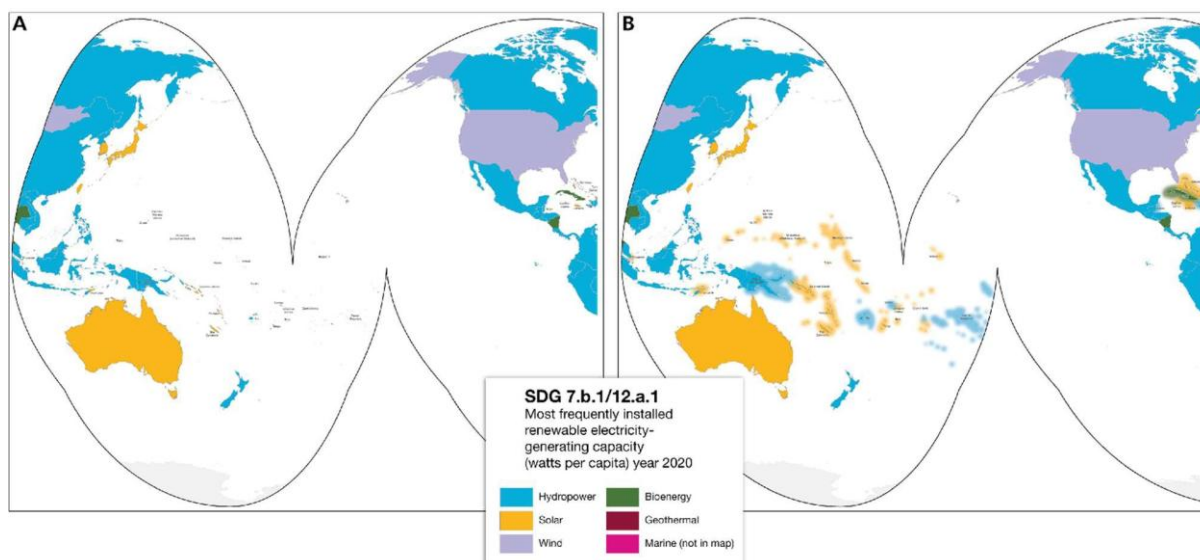


Figure 1: A part of the global thematic map for SDG 7.b.1. A (left): the SIDS are not visible at all or too small to show the classified thematic colour. B (right): the vignette/firefly around the SIDS raises the visibility of the thematic class of (groups of) islands and also reflects their comparative size.

In further work, we applied a ring map design (Battersby et al., 2011) that explicitly states the respective thematic values for small islands in rectangles around the map. Two maps were printed on oversized A0 and delivered to the UN-OHRLLS and UNGIS office in December 2025. We will conduct usability studies to investigate the readability and usability of our map designs. We also aim to identify the feasibility of generating a map template for the UN-OHRLLS office to use for internal and external SDG publications.

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