

## Sustainable Ocean Economy Classification

### Metadata for determination of sector/country coefficients

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This document details the methodology used to create the UNCTAD 'Ocean Trade' database for trade in **goods**, part of the Sustainable Ocean Economies (SOE) project. The data source is UNCTADStat: <https://unctadstat.unctad.org/EN/>.

#### I – Antecedents

##### *1.1. The Sustainable Ocean Economies (SOEs) classification*

The identification of sustainable ocean economy sectors and their respective Harmonized System codes (HS codes) was conducted in the UNCTAD (2021b) report '[Towards a harmonized international trade classification for the development of sustainable ocean-based economies](#)'. The Sustainable Ocean Economy sectors for trade in **goods** are:

- A- Marine fisheries
- B- Aquaculture and hatcheries
- C- Seafood processing
- D- Sea minerals
- E- Ships, port equipment and parts thereof
- F- High-technology and other manufactures not elsewhere classified

##### *1.2. The first SOEs report*

A first report was published on SOEs in 2021, titled '[Advancing the potential of sustainable ocean-based economies: trade trends, market drivers and market access](#)' (UNCTAD, 2021a). A methodological constraint at the time was to match UNCTAD's SOE classification for goods, which uses the HS codes revision of 2017, with the data reported by countries in the previous HS code revision (2012). Many countries had reported data for the years 2015 and 2016 in HS revision 2012 and the years 2017 and 2018 in HS revision 2017. The report identified the correspondence codes between HS 2017 and HS 2012. Given that some HS codes, particularly codes related to fisheries, have multiple correspondence, the first Sustainable Ocean Economy report used the HS code revisions matching 2012 and 2017 identified by the FAO.

The first SOEs report used slightly different coefficients to distinguish ocean-based from land-based activities. The coefficients retained in this document are in certain cases more conservative due to a reappraisal of the share of the sector that is ocean-based (as opposed to activities conducted inland).

## II – Methodological constraint: data aggregation

HS codes for trade in goods by sector do not differentiate between ocean-based and land-based activities. In many cases, several industries are grouped within one HS code. As a result, in creating a new database for ocean trade in goods by country and sector, UNCTAD had to determine coefficients which estimate for each country the percentage of each economic sector that is ocean-based.

The coefficients are then applied to [UNCTADStat](#) data on trade in goods and available on the website in the 'Ocean trade' database.

## III – Methodology for coefficients by country and sector

The coefficients are estimated for exports. Import coefficients are mirrored on export coefficients to reduce asymmetries. Data analysis in reports focuses on exports.

### *3.1. Country characteristics*

Geographical and industrial characteristics of countries were used to estimate coefficients for ocean-economy activities.

The geographical characteristic retained is the level of proximity of each country to oceans, leading to the following country classification:

- Landlocked
- Coastal
- Large island: island country greater than 100,000km<sup>2</sup> (the closest country below this threshold is nearly half of it: Sri Lanka with 65,000km<sup>2</sup>). 10 countries match this criterion: Indonesia, Madagascar, Papua New Guinea, Japan, Malaysia, Philippines, New Zealand, UK, Cuba, Iceland.
- Small Island: island country smaller than 100,000km<sup>2</sup>. 50 countries. Note: Singapore and Hong Kong are classified as small islands because they have similar characteristics given that they are city ports.

The industrial characteristic retained is whether a country is a shipbuilder, which influences the coefficients attributed for Sector E (Ships, port equipment and parts thereof). A shipbuilder is defined as a country with a national shipbuilding industry with a global market share over one percent OR the presence of large domestic cargo handling equipment manufacturers. The countries classified as shipbuilders are: China, Japan, South Korea, Germany, Poland, Italy, Finland, Norway, India, Turkey, US, Switzerland (OEC, 2021; OECD, 2019; Industry Arc, 2021; Markets and Markets, 2021; Mordor Intelligence, 2021).

### *3.2. Sector characteristics*

The Sustainable Ocean Economy sectors are divided into single-source sectors, regrouping activities that are only ocean-based, and dual-source sectors, which contain activities that are both land-based and ocean-based.

**Single-source sectors (A, B, C and E)** have coefficients of 1 since they are only relevant to the ocean economy.

## Limitations:

- Sector B is included in Sector A due to the overlap of HS codes, which do not distinguish between aquaculture and fisheries. FAO harvesting and production data could be used to differentiate between these two sectors at the national level but not in relation to trade flows. The current SOE classification only aims at covering trade flows so far.
- Sectors A/B represent marine fisheries and aquaculture given that HS codes do not distinguish between the two. As much as possible, HS codes selected for sector B target marine species only. Anadromous species such as salmon are considered marine species for the purposes of the SOE classification as they pass most of their life in seawaters.
- Sector A exports of landlocked countries thus represent freshwater fisheries and aquaculture, given that those countries do not have access to marine fisheries (re-exports of marine-fisheries are counted in Sector C (seafood processing)).

**Dual-source sectors (D, E, F)** have coefficients between 0 and 1 since they include both land-based and ocean-based activities. The coefficients estimating the share of the sector that is ocean-based are estimated using the available literature.

## Sector D: Salt

- D1 (Sea salt): coefficient of 1 for small islands, 0.7 for big islands, 0.5 for coastal countries, 0 for landlocked countries. Reasoning: Sea salt represents half of total salt production comprised in the HS code 'Salt', the remaining is rock salt, which has industrial applications (GVR, 2021; Statista, 2021)
- D2 (Natural sea sand): coefficient of 1 for small islands, 0.5 for big islands, 0.2 for coastal countries, 0 for landlocked countries. Reasoning: The majority of natural sand used is pit sand (land-based) because it is a better binding agent than sea sand. There is no data on the global sea sand market (United Nations 2017: 365).

## Sector E: Ships and parts thereof

- E1 (Vessels): coefficients of 1 as directly linked to ocean activities.
- E21 (Parts of vessels and inputs supporting navigation and ports - Cargo-handling equipment): coefficients of 0.5 for countries with shipbuilding industry, if not then 0.35 for coastal or island countries, if not then 0.1 for landlocked countries. Coefficients estimated based on:
  - o The relevance of subsector E21's HS codes to the ocean-economy. Of the 49 HS Codes for E21, 10 are very relevant to the ocean economy, 39 are not as they also represent activities in the land economy. 10/49 gives approximately a coefficient of 0.2. The 10 very relevant HS codes tend to be larger in market size than the 39 less relevant ones, hence proposed average coefficient of 0.35.
  - o Coastal and island countries require those goods, hence are likely to have some domestic suppliers (even though they may not qualify as a shipbuilding country).
  - o The presence of a shipbuilding industry/cargo handling industry according to the definition set in section 3.1. entails a higher export coefficient, estimated at 0.5.

- E22/E23 (Parts of vessels and inputs supporting navigation and ports – Navigation aids, communications and IT systems appliances and equipment for maritime transport and ports/Parts of vessels and other inputs n.e.c. specific to maritime transports and ports): coefficients of 0.3 for shipbuilding/cargo handling equipment manufacturers, 0.2 for coastal and island countries, 0.1 for landlocked countries. Reasoning: Coefficients estimated based on:
  - o The relevance of subsectors E22/E23's HS codes to the ocean economy. Of the 13 HS Codes in E22, 1 is very relevant to the ocean economy and 12 are not very relevant. Of the 98 HS Codes for E23, 6 are very relevant and 92 not very relevant: 6/98 and 1/13 = minimum coefficient of 0.1.
  - o The presence of a shipbuilding/cargo handling industry, which entails higher exports. Proposed coefficient of 0.3.
  - o Whether a country is an island, coastal or landlocked.

#### Sector F: High-technology and other manufactures not elsewhere classified

- F1 (Manufacture for the fishing and aquaculture industries, excl. vessels and parts thereof): coefficients of 0.8 for small islands, 0.6 for big islands, 0.5 for coastal, 0.2 for landlocked. Coefficients based on:
  - o The relevance of subsector F1's HS Codes to the ocean economy. Of the 48 HS codes, 18 are very relevant and 30 not very relevant = minimum coefficient of 0.4. Similar ratio for F11 and F12.
  - o Whether a country is an island, coastal or landlocked. Landlocked countries are unlikely to have a domestic market for marine fisheries, yet may export manufactures for marine fisheries. Landlocked countries may specialise in manufactures for inland fisheries and aquaculture (which represents half of total fish production (OWID, 2021)), but most of the HS Codes in F1 relate to fishing not aquaculture, hence the lower coefficient (0.2) for landlocked countries.
- F2 (High tech manufactures for environmental sustainability and clean energy): coefficients of 0.5 for small islands, 0.3 for big islands, 0.2 for coastal, 0.1 for landlocked. Coefficients based on:
  - o The relevance of subsector F2's HS Codes to the ocean economy: 2/32 are very relevant, the rest are not very relevant, hence minimum coefficient of 0.1.
  - o Whether a country is an island, coastal or landlocked.
- F3 (Pharmaceuticals and chemicals made of marine organisms): coefficients of 0.2 for all countries. Reasoning: Around 70 percent of all pharma products come from nature (the remaining are synthetic), and of these most come from land sources (animals or plants), although marine drugs have a high growth potential. (Hitti, 2007; NOAA, 2021). Given that the HS codes refer to medicaments, it is futile to distinguish between coastal and landlocked countries as they can import the active ingredients. The same reasoning applies for cosmetics (Alparslan et al., 2018).
  - o F33 (Supply and equipment of the marine pharmaceutical or chemical industry) has no HS Codes provided in the classification, hence no coefficient is needed.
- F4 (Manufacture of coastal and marine sport goods, textile articles and other materials): coefficients of 0.8 for small islands, 0.6 for big islands, 0.4 for coastal, 0 for landlocked. Coefficients based on:
  - o The relevance of subsector F4's HS Codes to the ocean economy: 1/4 is very relevant to the ocean economy, hence minimum coefficient of 0.25.
  - o Whether the country is an island, coastal, or landlocked.

- F5 (Other electrical equipment): coefficients of 0.02 for all countries. Coefficients based on:
  - o The relevance of subsector F5's HS Codes to the ocean economy: Only 3/18 activities have an HS code. Of the 3, none is very relevant to the ocean economy.
  - o The US Bureau of Economic Analysis (2020) published its first report on the US Ocean Economy, with a value-added estimated at 397b \$US or 1.9 percent of US GDP. The OECD's Ocean Economy Database estimates ocean economy output in 2010 at USD 1.5 trillion, or approximately 2.5% of world gross value added, of which offshore oil and gas accounted for one-third, followed by tourism and maritime equipment/ports (Copernicus 2017). Ccl: A coefficient of 0.02 is a good guess when no other estimate is available.

#### IV – Summary of coefficients

Table 4.1: Summary of coefficients

	Small island	Big island	Coastal	Landlocked	Shipbuilder*
A	1	1	1	1	
C	1	1	1	1	
D1	1	0.7	0.5	0	
D2	1	0.5	0.2	0	
E1	1	1	1	1	
E21	0.35	0.35	0.35	0.1	0.5
E22/E23	0.2	0.2	0.2	0.1	0.3
F1	0.8	0.6	0.5	0.2	
F2	0.5	0.3	0.2	0.1	
F3	0.2	0.2	0.2	0.2	
F4	0.8	0.6	0.4	0	
F5	0.02	0.02	0.02	0.02	

\*Prioritised over other categories

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