

2. Status of mariculture from a spatial perspective

The objective of this chapter is to portray the current status of mariculture spatially in terms of the intensity of existing inshore mariculture production. The rationale and approach are similar to those set out in more detail by Kapetsky, Aguilar-Manjarrez, and Soto (2010 pp. 75–88).

The data sets used in this chapter, the mean annual mariculture production by weight and by country from 2004 to 2008 (FAO Statistics and Information Branch of the Fisheries and Aquaculture Department, 2010) and the coastline length by country established by GIS analyses, are described in Annex 1, Table A1.1. The latter data set was generated especially for this study and the methods are described in Annex 1.

2.1 Nominal intensity of the use of the coastline for mariculture at the national level

Mariculture is widespread geographically throughout all climate zones except in Antarctica. In all, 93 countries and territories practised mariculture during the period 2004–2008, and there were 72 maritime countries and territories that were not yet practising it. As mentioned previously, most mariculture production comes from protected inshore waters at or near the coastline (i.e. waters sheltered by headlands, islands, sandbanks, reefs and other physical features). At the national level, coastline length is basic to mariculture potential because it is a measure of “frontage for development”. It is from the coastline that offshore mariculture will be supported and from which development will proceed seaward. Mariculture nations possess about 1.47 million km of coastline whereas non-mariculture nations have only about 0.3 million km (Table 2). An important point is that for offshore mariculture the requirement of shelter is removed. Thus, all coastal frontage theoretically becomes available for offshore mariculture, unlike current inshore mariculture that tends to be constrained by the availability of sheltered waters.

TABLE 2
Status of mariculture from a spatial perspective

Criteria	Mariculture nations		Non-mariculture nations		Total	
Production	Countries and territories*	Mean production (tonnes) 2004–08	Countries and territories	Mean production (tonnes) 2004–08	Countries and territories	
	93	29 976 736	72	0	165	
Coastline length	Nations	km	Nations	km	Nations	km
	80	1 472 111	83	302 548	163	1 774 659
Mariculture intensity of 93 countries and territories				Production of aquatic plants and animals (tonnes/km coastline)		
Mean (tonnes/km)				15		
Median (tonnes/km)				1		
Maximum (tonnes/km)				519		

*Databases for production by countries and territories and for coastline length differ slightly in numbers of countries and territories. The FAO statistical database contains production attributes assigned to country and territory names. It reports production from some territories separately from their associated sovereign nations. In contrast, coastline length was derived for this study using GIS methods from a different set of country and territory associations in digital format in which each coastline is a spatial object from which its length becomes an attribute. The differences have been taken into account in estimating mariculture intensity.

Whereas coastline length is a very basic measure of mariculture potential in terms of frontage for development, so is intensity of total mariculture production expressed as tonnes/km of coastline by nation, a baseline measure of actual use of the coastline for mariculture. This is only a crude measure of mariculture intensity because coastal farms are not homogeneously distributed along the sea coast. But because of the non-homogeneous distribution of mariculture, it does express minimum use of the coastline for that purpose, however crude. Mariculture, including fish, invertebrates and aquatic plants, is diverse in terms of the intensity of its practice, covering five orders of magnitude, with ranges from a fraction of a tonne/km in many countries up to 519 tonnes/km in the People’s Republic of China where seaweed is a significant part of mariculture (Figure 4). After considering the People’s Republic of China, the intensity of mariculture production drops to less than 100 tonnes/km of coastline (Figure 5).

FIGURE 4
Intensity of mariculture production (2004–2008) in tonnes per kilometre of coastline and numbers of countries in the range

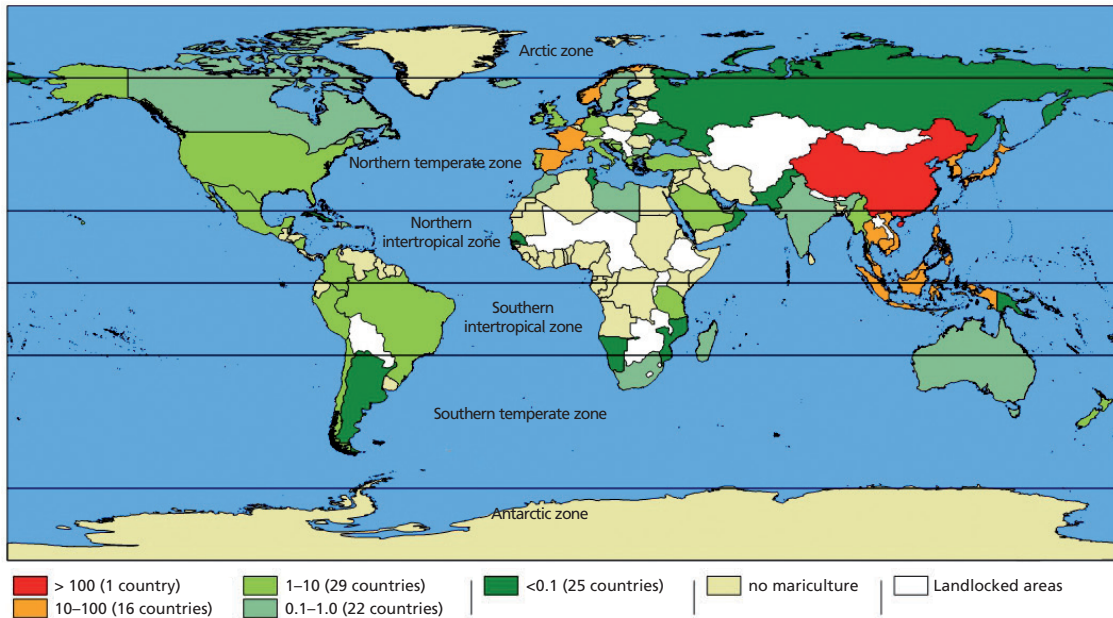
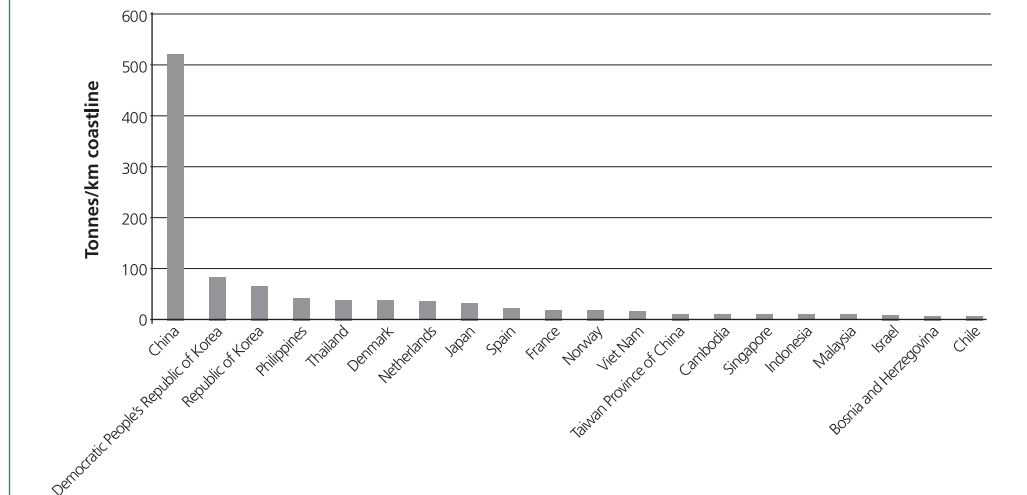


FIGURE 5
Ranking by area of main nations in intensity of mariculture (tonnes/km coastline) production (2004–2008)



In summary, the present status of mariculture suggests that the global potential for offshore mariculture in aggregate and for many nations individually is large for the following reasons:

- (i) Forty-four percent of maritime nations are not yet practising mariculture.
- (ii) There are 0.3 million km of coastline where mariculture is not yet practised.
- (iii) Among the 93 countries and territories already practising mariculture, one-half produce at a relatively low intensity of less than 1 tonne/km of coastline.
- (iv) It is well known that nearly all of present-day mariculture takes place in sheltered inshore waters and not in offshore waters (Plates 4 and 5).

PLATE 4
Net cages along the coast of Turkey



COURTESY OF O. ALTAN

PLATE 5
Net cages along the coast of Norway



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