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INTER-REGIONAL NETWORK TO PROMOTE SUSTAINABLE DEVELOPMENT IN THE MARINE ALGAL INDUSTRY

PORTUGUESE **MACROALGAE** INDUSTRY

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The harvest of seaweed is a major industry worldwide. Global harvesting of seaweed for use as food products is estimated to value over 3.6 billion US dollars annually. Additionally, the annual estimated value of the production of phycocolloids (i.e., alginates, agar, and carrageenan) from seaweed is 2.6 billion US dollars. The harvesting of marine algae for human use has been recorded before the 14th century in Portugal. This practice began by collecting beach cast seaweed for use as fertiliser. In the 80's Portugal had the world's 5th largest agar production. Nowadays it is residual. The latest FAO reports on seaweed production show that Asia (China predominantly), account for 89% of the world's macroalgae production. After East and Southeast Asia, Chile is a major producer in Latin America. Aquaculture is an important method of producing seaweed resources accounting for 52% of commercial production. The remaining 48% is, therefore, collected from wild stocks.

Geographical areas of macroalgae exploitation

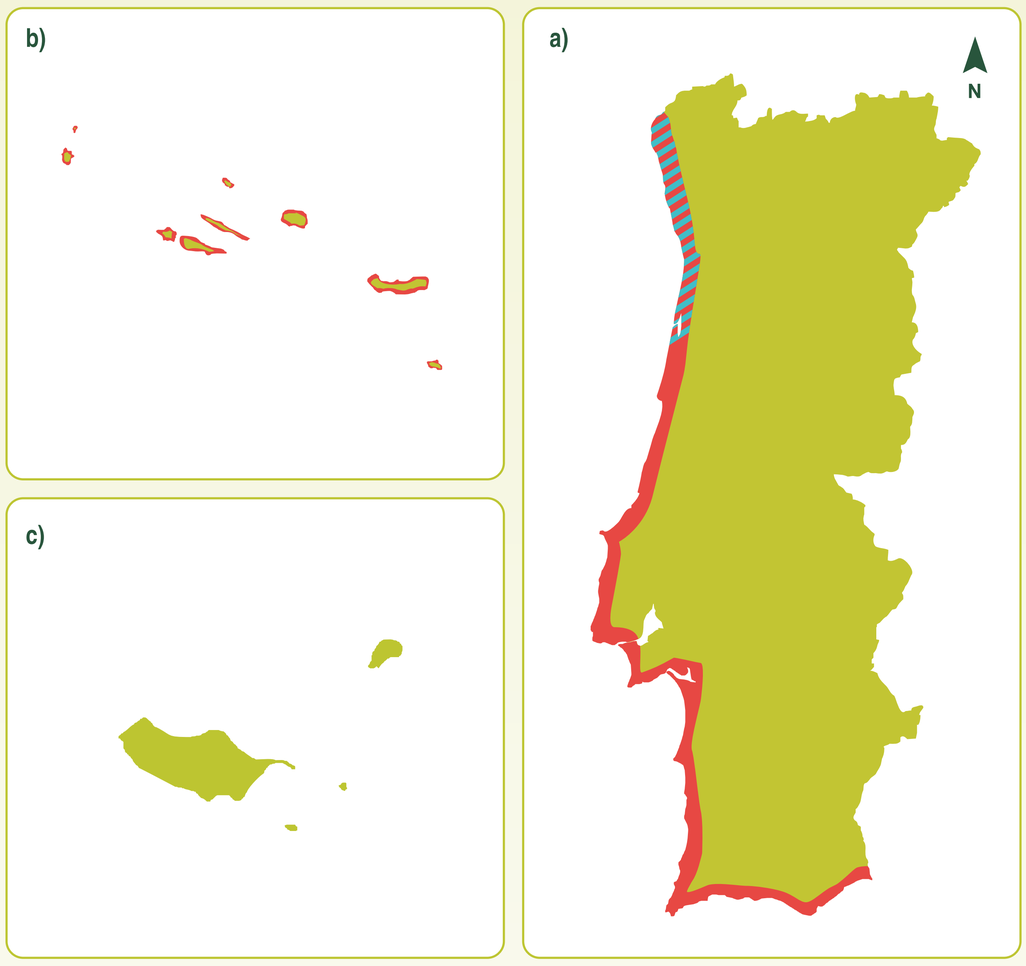

Figure 1: (a) Portugal's Mainland, (b) Azores Isles, (c) Madeira Isles Agarophyts Carrageenophyts

Characteristics

Main species harvested

Agarophyts:
- *Gelidium sesquipedale*
- *Gracilaria spp.*
- *Pterocladia capillacea (Azores, residual)*

Carrageenophyts:
- *Chondrus crispus*
- *Mastocarpus stellatus*
- *Gigartina pistillata*

Diversified markets

- Food
- Diet supplements
- Animal use
- Health and beauty treatments
- Agriculture – Fertiliser

The 2 main mixes of algae traditionally used in aquaculture as fertiliser are "moliço" and "sargaço". "Moliço" is a mix of algae and marine plants harvested in the Ria de Aveiro , containing *Ulva, Gracilaria, Lola* and also *Zostera, Ruppia and Potamogeton.* "Sargaço" (also called "argaço e limos") is the mix of several marine algae: *Saccorhiza, Laminaria, Fucus, Codium, Palmaria, Gelidium and Chondrus*, which grow on the subtidal.

Production

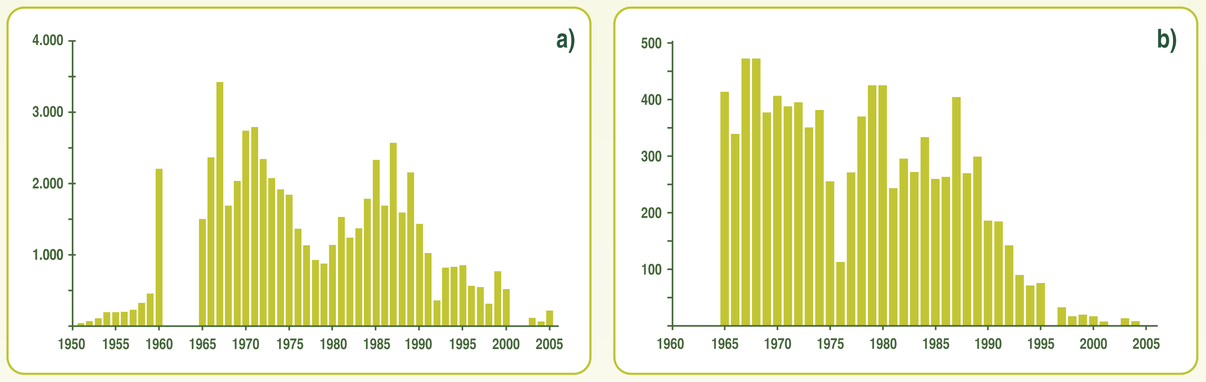

Figure 2: Annual tonnages of landings for (a) Agarophyts and (b) Carrageenophyts (gross weight per ton)

Structure

Category	Agarophyts	Carrageenophyts
Authority and management	Ministry of Agriculture, Sea, Environment and Spatial Planning / General Board of Fisheries and Aquiculture	Ministry of Agriculture, Sea, Environment and Spatial Planning / General Board of Fisheries and Aquiculture
Management system	Access to legal divers at specific time	Access to legal harvesters at specific time
Harvesting method	Diving	Hand harvesting on the shore
Species of algae	*Gelidium sesquipedale (e.g.)*	*Chondrus crispus (e.g.)*
Transformation	Extraction; purification; drying; grinding; final mix	Extraction; filtering; precipitation; drying, grinding; final mix
Products	Food and additives €€ / Biotechnology €€€ / Medical and pharmaceutical €€€ / Health and beauty €€ / Fertiliser €	Food and additives €€ / Fertiliser € / Medical and pharmaceutical €€€ / Health and beauty €€

Usages Industry Agriculture Health industry Food industry

Economic importance (in euros) : **€€€€** : very important; **€€€** : important ; **€€** : less important **€** : not important

Figure 3: Organisation of the Portuguese macroalgae industry

Portuguese partner: University of Algarve, Portugal
International partners: Indigo Rock Marine Research Station (lead partner), Bord Iascaigh Mhara, Mutrikuko Instituta, Viking Fish Farms, Université de Bretagne Occidentale , Pôle halieutique – AGROCAMPUS OUEST , Syndicat Mixte Pour l´Équipement du Littoral, Bioforsk

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