

MARINE AQUACULTURE DEVELOPMENT PLAN IN THE REGION “DAKHLA-OUED EDDAHAB”

CALL FOR EXPRESSION OF INTEREST



Agence Nationale pour
le Développement
de l'Aquaculture



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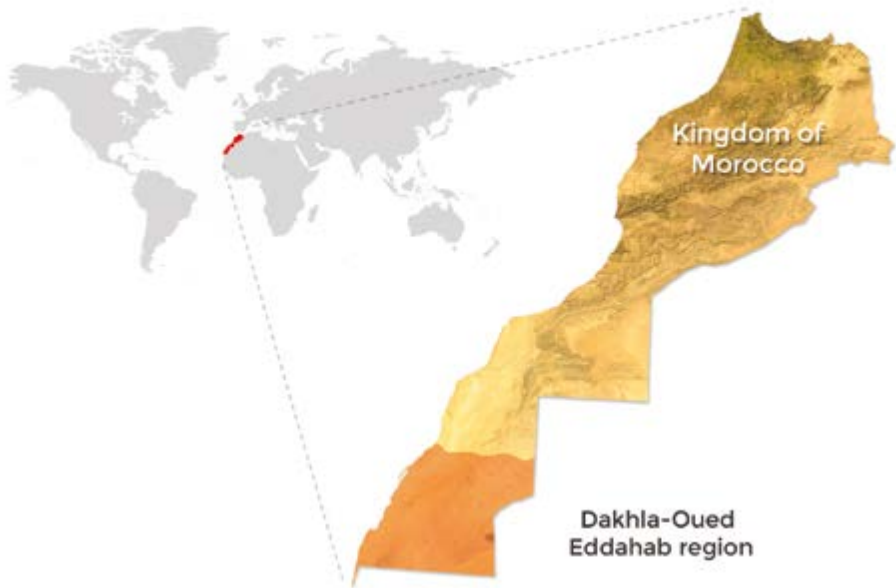
Region overview



The region Dakhla-Oued Eddahab is historically considered as a trade corridor of goods between sub-Saharan Africa, the north of Morocco and Europe. This area of about 142,865 km² of width is populated by almost 99,617 inhabitants mainly located in Dakhla city.

Rich in natural assets and of its idyllic favorable weather conditions for many economic activities, the region Dakhla-Oued Eddahab is among the most privileged territories for economy development and entrepreneurship in Morocco.

The region's economy is based mainly on fishing, fish processing, crop production, livestock farming and tourism. Tourism is recording a major boom thanks to natural assets of the region, which annually attracts thousands of nationals and foreigners tourists. Dakhla bay is considered as one of the leading aquaculture sites in the country. It is also one of world's best kitesurfing spots.



Why invest in aquaculture in the region Dakhla-Oued Eddahab



الداخلة
DAKHLA
37

AEROPORT DAKHLA

مطار الداخلة

مطبخ

مطبخ

Why invest in aquaculture in the region Dakhla-Oued Eddahab

An area in the heart of exchanges with continuously developing infrastructure

The region Dakhla-Oued Eddahab relies on an efficient transport and logistics infrastructures. Indeed, through its important port infrastructure dedicated to fishing and trade, its international airport, its road network and its fishing villages, the region has a great potential for development of the aquaculture industry.

An important industrial fabric reinforcing growth of Region economy

Industrial fabric of the region is based mainly on the fisheries industry (processing and freezing) and the commercial sector, mainly located in Dakhla in two centers:

- ▶ **Port Industrial Zone of Dakhla (Free Export Zone in Dakhla, ZFED)**
Its main activities concern food-processing and fishing industry as well as trade. This zone has a surface of 300 hectares, which 60 hectares have been developed into more than 300 industrials lots.
- ▶ **Industrial Zone Essalam in Dakhla**
Located in the south of Dakhla city. It covers 45 ha including 24 ha of equipped areas, for a capacity of 326 lots. This is the first step in a larger program which will occupy an area of 270 ha.

A medium- and long-term vision for development of Moroccan aquaculture

Economical and touristic attractiveness of the Region will be enhanced by implementation of national strategy of Moroccan aquaculture development across the region. On basis of this strategy, aquaculture activity will promote creative and innovative image of fishing economy in the region, thanks to its specificities and its potentialities.

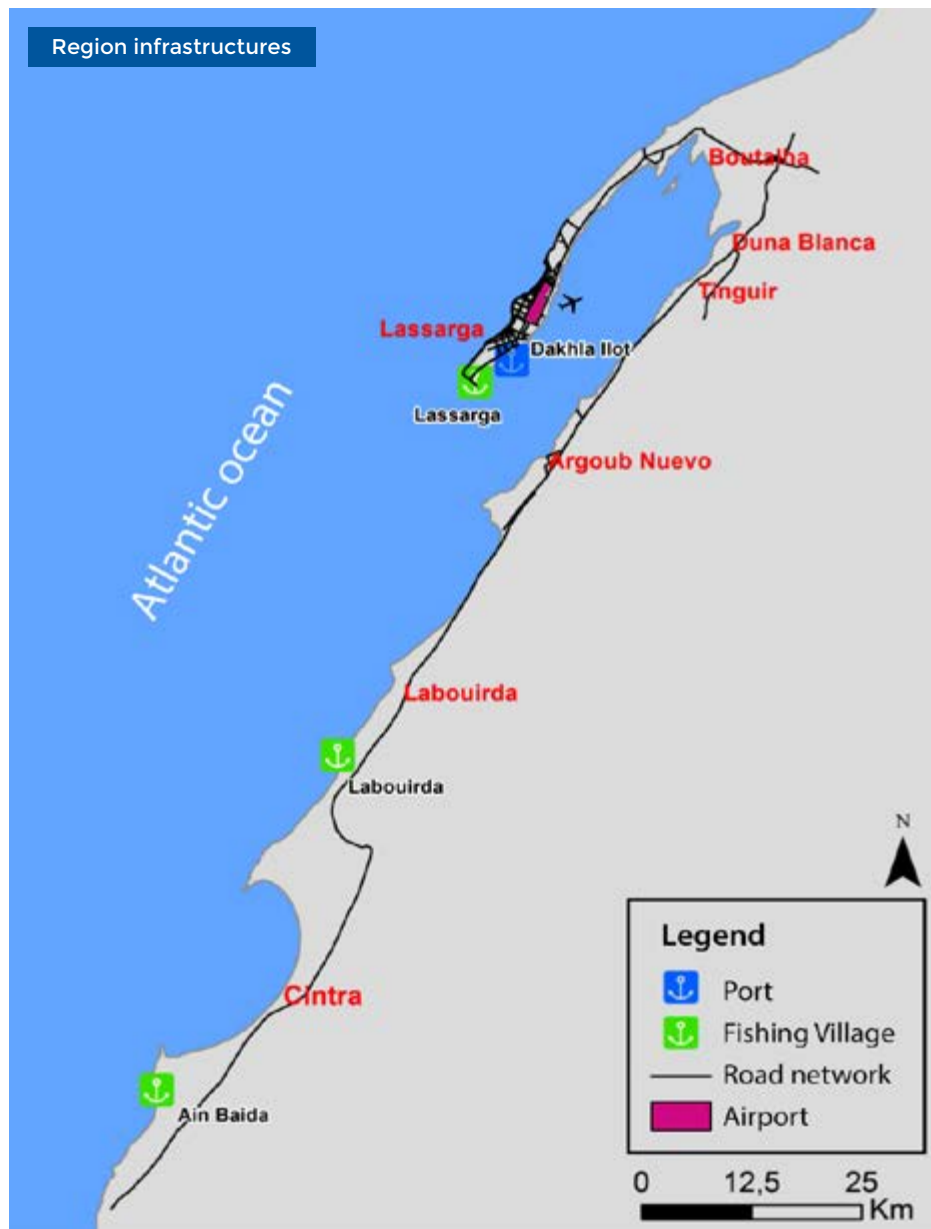
Consistency and adaptation of the aquaculture plan initiated by the National Agency for Aquaculture Development with the region's development strategy

Development of aquaculture Plan is coherent with the broad guidelines of other region's development plans. It intends to organize coexistence of aquaculture with other economic activities and propose potential spaces in harmony with its needs and requirements. The aquaculture plan is the result of a multitude of scientific, technical and financial studies conducted from 2013 to 2015, over 225 km of coastline from the city of Dakhla to the south of Cintra Bay.

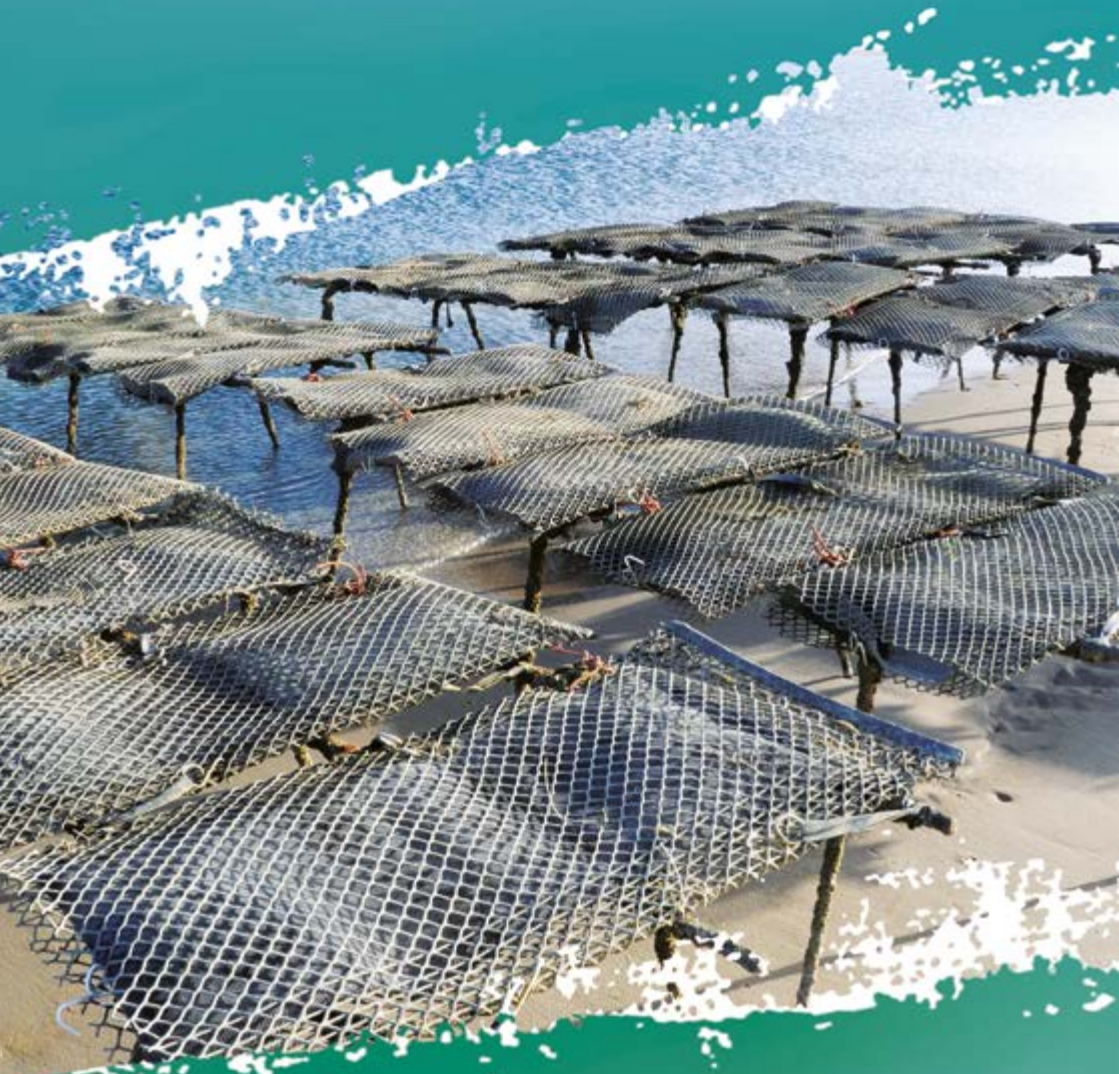
A plan that respects its environment for sustainable aquaculture

A promising and growing market

Region infrastructures



Overview of the Aquaculture Plan of the region Dakhla-Oued Eddahab



Overview of the Aquaculture Plan of the region Dakhla-Oued Eddahab

The area concerned by this Aquaculture Plan is bounded between north of Dakhla Bay and south of Cintra Bay on a cumulative distance of 225 km.



The area has a huge potential to host a wide range of aquaculture projects. Currently, this activity is based on shellfish farming and it is located mainly in Dakhla bay, specifically in Boutalha and Duna Blanca sites, where oyster farming is developed. Beside of this, other coastal activities are developed as harvesting of multiples shellfish species such as razor clams, winkle, cockle and mussels.

AQUACULTURE PLANS?

Aquaculture plans define priorities according to which objectives of the sustainable development policy of aquaculture resources are implemented in the zones.

They set measures to promote responsible development and management of marine aquaculture and the rational, balanced and equitable use of spaces available that can accommodate aquaculture activities, considering other aquaculture activities already exerted in the same area as well as maritime fishing and other economic activities.

Undertaken approach for development of aquaculture plan in the region

- A** Situational analysis which consisted of establishment of land and sea spaces occupation and eventually the pre-delimitation of areas available for exercise of the activity which is considering technical factors and others related to existing uses;
- B** Identifying the characteristics of the environment at the pre-delimited areas. It aims study of biodiversity, benthic infauna, water quality (temperature, salinity, dissolved oxygen, chlorophyll, turbidity ...) and oceanographic parameters;
- C** Development of aquaculture schema structures through the study of biological and technical feasibility of aquaculture projects with the definition of areas favorable to aquaculture activity, of potential species and farming technology;
- D** Assessing environmental impacts of the aquaculture development plan.

The Aquaculture Plan of the region Dakhla-Oued Eddahab in figures

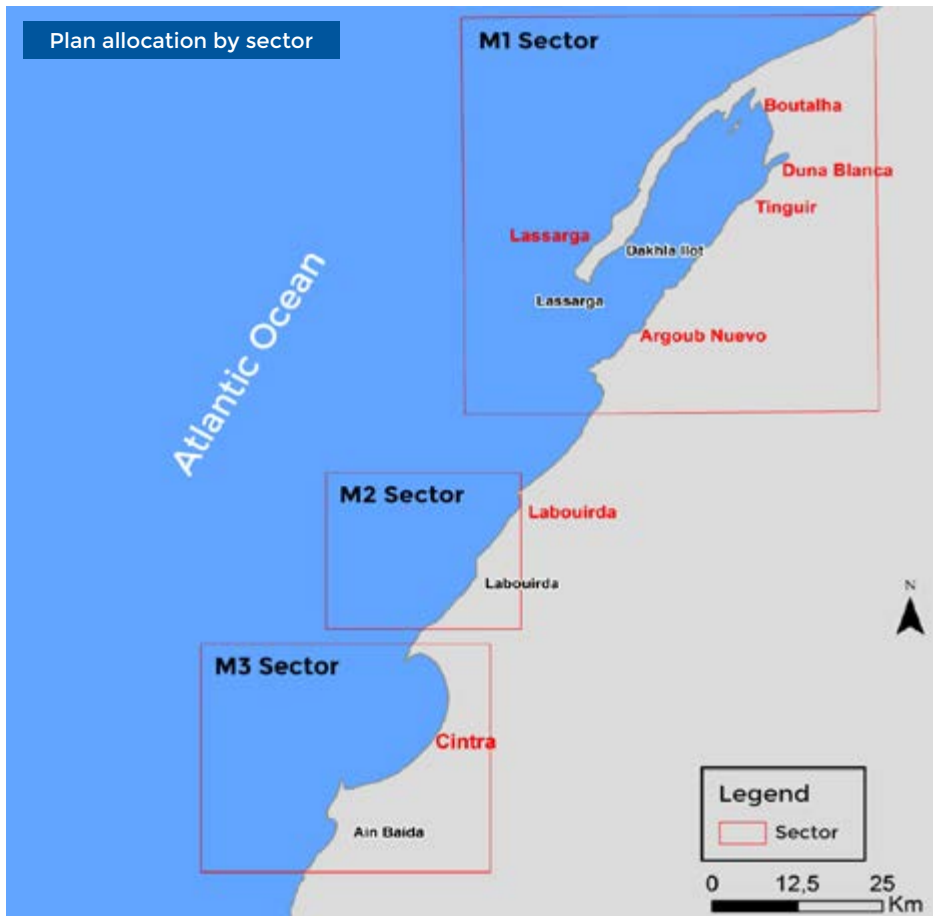


IV

The Aquaculture Plan of the region Dakhla-Oued Eddahab in figures

A. Subdivision of the area into three homogeneous sectors

To facilitate the implementation of the development plan of the concerned area and to guide investors according to dimensions of their future projects, species to breed and breeding technique, the study area was divided into 3 homogeneous spaces / areas, with similar environmental and socio-economic conditions, namely: M1 Sector (Dakhla bay), M2 Sector (intermediate zone) and M3 Sector (Cintra bay).

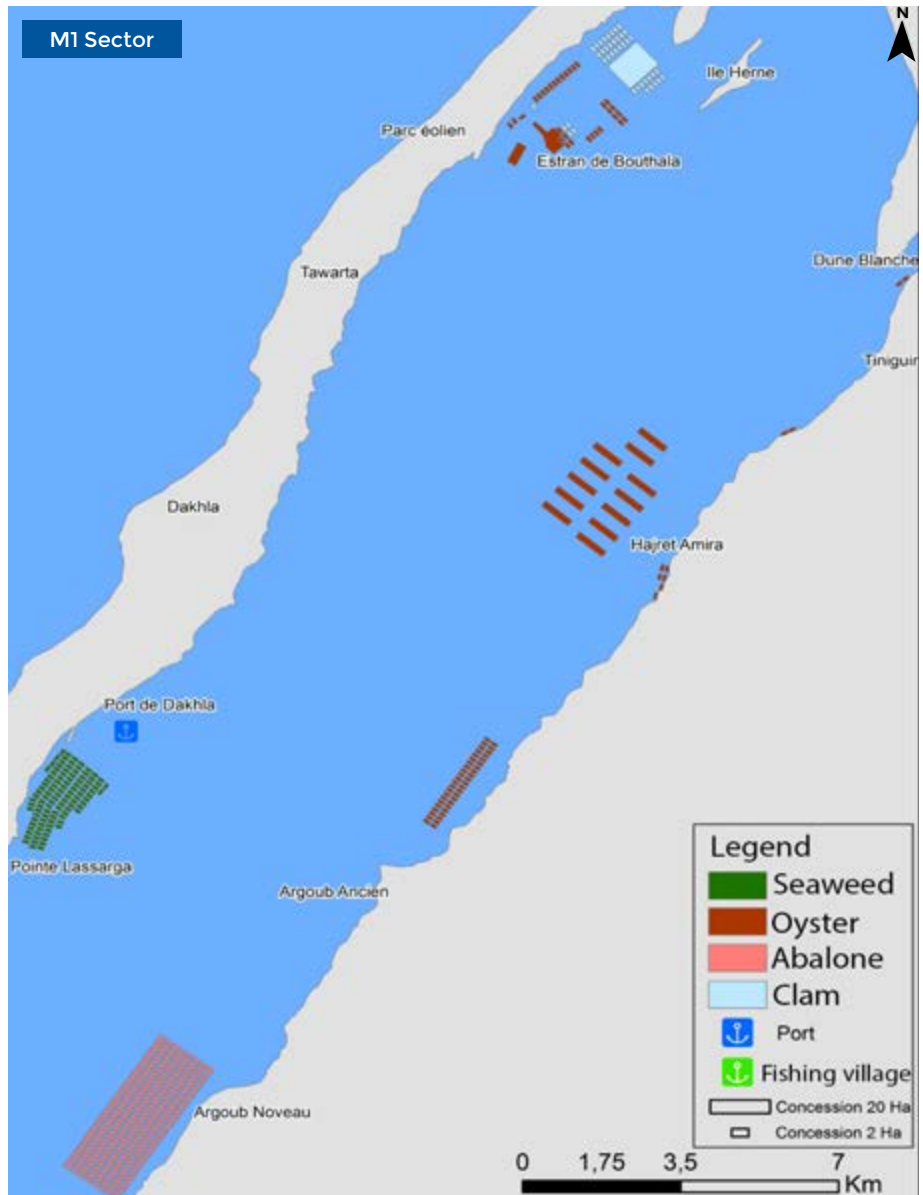


B. Number of production units, surface area and production target by sector

Sector	Numbers of production units	Area (Hectares)	Target production in Tons/year
M1 Sector	520	1 430	20 190
M2 Sector	115	2 300	23 500
M3 Sector	243	2 826	71 760
Total	878	6 556	115 450

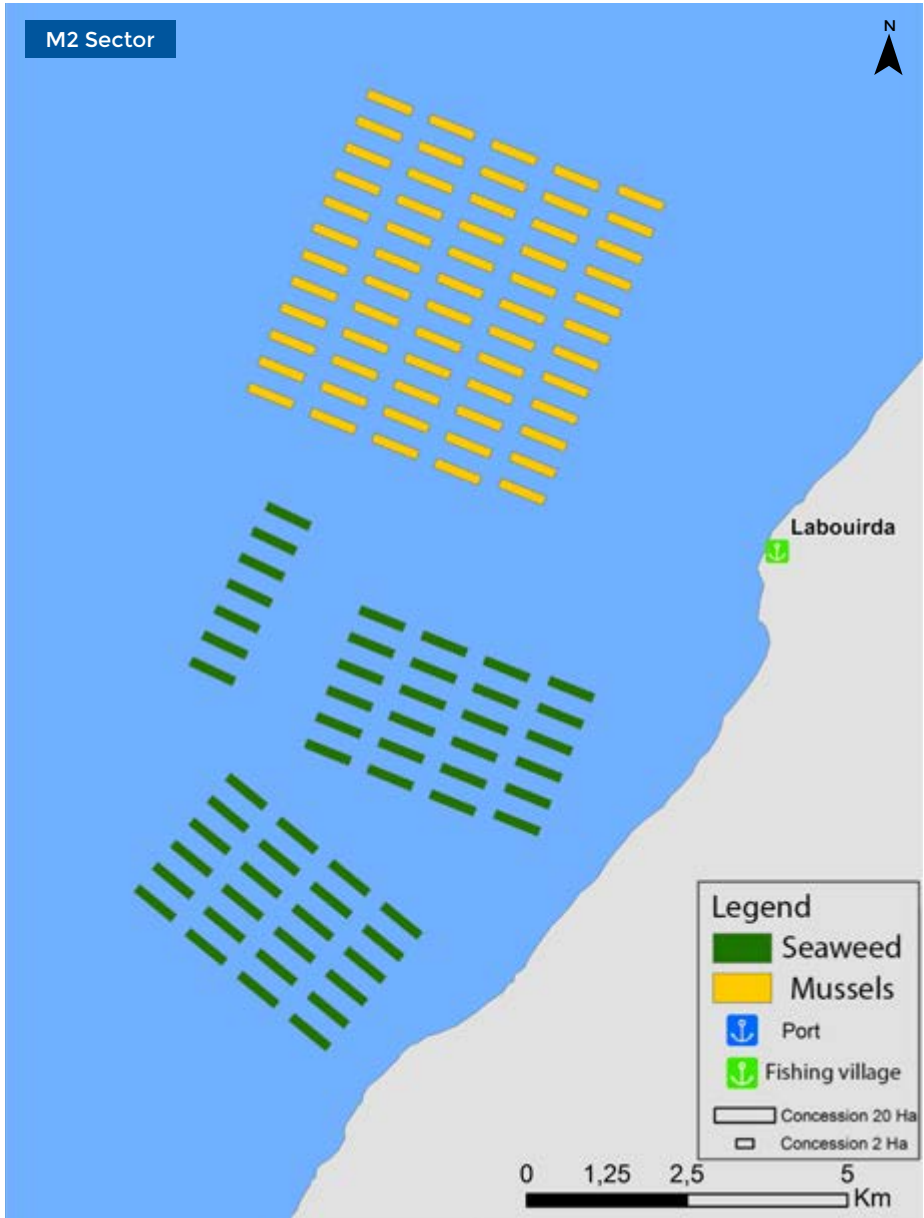
C. Aquaculture investment opportunities in the M1 Sector

- ▶ 86 production units of 2 hectares (Ha) each for oyster farming;
- ▶ 12 production units of 20 Ha each for oyster farming;
- ▶ 41 production units of 2 Ha each for clams farming;
- ▶ 272 production units of 2 Ha each for abalone farming;
- ▶ 106 production units of 2 Ha each for seaweed farming.
- ▶ 1 production unit of 120 Ha for clam farming;
- ▶ 1 production unit of 20 Ha for oyster farming;
- ▶ 1 production unit of 40 Ha for oyster farming;



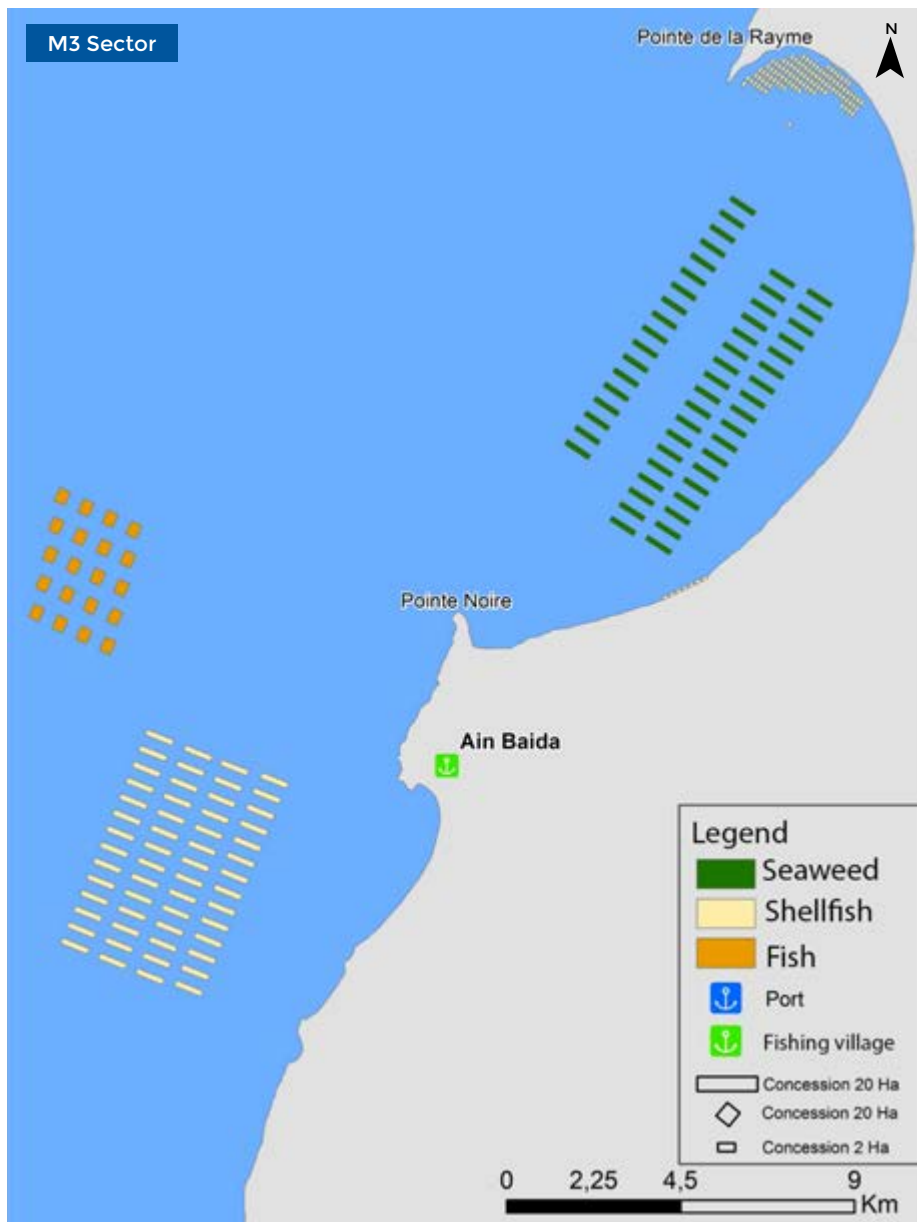
D. Aquaculture Investment opportunities in the M2 Sector

- ▶ 60 production units of 20 Ha each for mussel farming;
- ▶ 55 production units of 20 Ha each for seaweed farming.



E. Aquaculture investment opportunities in the M3 Sector

- ▶ 113 production units of 2 Ha each for shellfish farming;
- ▶ 56 production units of 20 Ha each for shellfish farming;
- ▶ 54 production units of 20 Ha each for seaweed farming;
- ▶ 20 production units of 20Ha each for fish farming.



Annex



Annex

Environment characteristics

physical Variable	Parameter	Observation
Climate	Temperature (°C)	Annual Average
	Rainfall (mm ³)	Annual Average
	Evaporation (mm ³)	Annual Average
	Winds (m/s)	Speed and dominant direction
	Flooding	Annual average
Coastal geomorphology	Geomorphology	
	Sediment dynamics	Coastline
Seabed	Bathymetry (m)	
	Granulometry	
	Organic matter (LOI)	
	Endofauna	
Water Quality	Temperature (°C)	
	Salinity (PSU)	
	Dissolved oxygen	
	(mg / l)	
Hydrodynamics	Swell	dominant direction
		Hs 75 % (m)
	Currents	dominant direction
		Speed (m / s)
	Tides (m)	Mean high water
		Mean low water
Particle dispersion		

	Values by sector		
	M1 Sector	M2 Sector	M3 Sector
	18-23		
	50		
	671		
	5-8 NNE20		
	-		
	Cliffs: 2-17 m. outside, 2-5 m inside Beach	Cliff 10-20 m. Beach	Beach
	160 m3/an NNE - SSO		
	0-20 m.	0-60 m.	0-10 à l'intérieur
	Fine and very fine sand	Fine sand and medium sand	
	8 %	2 %	1-2 %
	rich	Low	Without presence
	17-19	16,5-18	14-17,4
	36-38	36,3-36,9	36,5
	5-9	7,34 - 8,58	7,3 - 8,6
	0 - 10	0 - 12	0 - 9,3
	N350 N040		
	2		
	NE/SO		
	0,5 - 1,5	0,5	0,2
	+ 2,30		
	- 0,90		
	< 90	<90 - >45	0 - >45

Data obtained during the oceanographic campaign conducted in February 2014



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