

*Project name: MED4EBM - Mediterranean Forum For Applied Ecosystem-Based Management*  
*Application case: EB-ICZM in Kneiss Islands Nature Reserve (Tunisia)*  
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# Mediterranean Forum For Applied Ecosystem-Based Management



Component	Name	Description	Update Frequency	Data Source	Notes
Agricultural Land	Crops Surface (Ha)				
Agriculture activities	Crops Surface (Ha)				
Agriculture activities	N° of Aquifer wells	The wells are used only under authoriz.  The salinity of this wells is very high.  Used mainly for the irrigation of Olive Groves	Annual	CRDA	
Agriculture activities	Ratio (Erosion index)	Ratio between the arable area and the total area. This index gives an evaluation of soil loss in the arable area, affected by erosion, desertification, soil salinity increase.	Episodic	CRDA APAL	
Agriculture activities	N° of Workers				
Aquatic and Terrestrial Fauna	Number of visits*	Number of people visiting the Nature Reserve. Number of authorisations given to the people (ecotourists, students, researchers, ...) visiting. Personal and group authorisations.	Episodic	Forest District of CRDA	Number is variable and it depends from seasonal and weather conditions.
Aquatic and Terrestrial Fauna	Fauna diversity	Wildlife and domestic fauna. Number of species.	Episodic and opportunistic	Forest District of CRDA	Observations are episodic and it depends on the observations. Rangers are reporting their observations..
Archaeological area	N° of Archae. Site		fixed number	Min. of Culture	Need more details
Archaeological area	Type of Archae. Site	Managed or not Fees Connected (how)			
Birds	Avifauna Density	Density of sedentary, wintering and nesting birds.  Data are from 2010	biannual	ACT (ngo) AAO (ngo)	
Birds	Sanitary Status of Avifauna	type of diseases and n° of dead birds	episodic.	Forest Discript of CRDA	It is present the description of the diseases
Birds	N° of Visit of the Island*	Number of authriz.	episodic	Forest Discript of CRDA	

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Birds	Avifauna Diversity	Diversity  Data are from 2010	biannual	ACT (ngo) AAO (ngo)	
Cereals	Annual Production (Qt.)				
Coastal fishing	N° of Small Boats	N° of small boat wit and without engine.	Yearly	CRDA	
Coastal fishing	Catch by type of Fishing	Amout and/or group of species caught according to the different type of fishing gears.	Annual	CRDA DGPA	
Coastal fishing	Subsidies	Amount of money for mantainance of boats, engine, fuel and nets.	Annual	CRDA Local Administration Fisheries (related to CRDA)	
Cultural and social dynamics	Population Estimation	data from 2012 to 2021	Annual	INS Raiba Municipality	
Cultural and social dynamics	N° of Studs. who left the school * (Level of Education)	conversion on agricultural activity	annual	Min. of Education	
Cultural and social dynamics	Economic Population Activities Distribution	% of population working on agriculture and industries and unemployed population	annual and data are available from year 2010	Raiba Municipality	
Cultural and social dynamics	N° of NGO's	Number of NGO's present in the are and their activities	Annual (episodic)	Raiba Municipality NGO's	
Cultural and social dynamics	Population number	Population number, that is living along the coastal areas. Delegation name: Smara and Hchichina.	Annual	National Institute of Statistics	
Cultural and social dynamics	Ratio * (Check Name)	Ratio between the population growth of the Delegations and the population growth of the governorate.	Annual	National Institute of Statistics	
Ecosystem	Area of Natural Protected sites (Ha)	This indicator involves the terrestrial, coastal and marine ecosystems.	Episodic	APAL Ministry Environment	
Extensive farming	Annual Production (Tons)				
Extensive farming	Numbers of Heads		Montly		
Fisheries	Sanctions	Number and Type of pecuniary sanctions	Monthly	CRDA Marine Guard Fishery District	

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Fisheries	N° of Fishermen	N° of fisheries authoriz.	Annual	Fishery District CRDA	
Fisheries	Fisheries workforce	N° and type of boats.	Annual	DGPA	
Forage	Annual Production (Tons)				
Goat farming	Annual Production (Tons)				
Goat farming	Number of Heads		Montly		
Humidity	Humidity (%)	Relative Humidity	daily data from automatic network of weather stations.	Web Service Ministry of Environment.....	Data are collected daily but must be displayed every 2 days.
Industrial activities	Quantity of pollutants	Quantity of pollutants released by the industrial unity. Data available until 2019, no for 2020 and 2021.	Until (check year, possibly 2014) it was annual. Now it stopped.	APAL ANPE	
Industrial activities	Volume of Water treated	Volume of Water treated by the industrial unity.	Until (check year, possibly 2014) it was annual. Now it stopped.	APAL ANPE	
Industrial activities	N° of Workers				
Infrastructures	Surface of new development areas (Ha)	This involves industrial, ports areas and road network, as well as waste stations, landfill (or/and dump places).	Episodic	APAL	
Livestock	Livestock Surface (Ha)				
Livestock	N° of Workers				
Marine Environment	pH		Monthly	APAL ACG	
Marine Environment	Number of red tides	This fenomenon became more frequent in the last years. Number of events of harmful algal bloom	Annual	INSTM	
Marine Environment	Temperature				
Marine Mammals	Monitoring Survey				
Marine Mammals	N° of Dead Individuals				

Component	Name	Description	Update Frequency	Data Source	Notes
Marine Vegetation	Area of Posidonia sp.	Surface of Posidonia sp. (m2)	Episodic (depending on researches)	INSTM	
Marine Vegetation	Flowering				
Marine Vegetation	Turbidity				
Marine Reptiles	Monitoring Survey				
Olive Groves	Annual Production (Kg)	Quantity/Area			
Other Arboriculture Activity	Annual Production (Kg)				
Other Invertebrates	Number of species	Number species, included the classification of threat (endangered, threatened, and so on)	Episodic, depending on researches	University (ies) INSTM	
Shore fishing (Clam and Annelids)	Clam quantity (Kg)		Annual		
Skhira industrial units	Accidental Pollution	In case of oil spill or environmental disaster data and reports will be provided for the evaluation of the situation.	In case of events.	Min of Environment AMPE	
Skhira oil Terminal	Accidental Pollution	In case of oil spill or environmental disaster data and reports will be provided for the evaluation of the situation.	In case of events.	Min of Environment AMPE	
Skhira Port	N° of Refrigeration Unit		Fixed Number	APIP	
Skhira Port	N° of Fishing Deposit	Storage of Fishermen equipment (nets)	Fixed Number	APIP	
Skhira Port	Landing Fees	Fisheries catch Value. the fees are the 2% of the total value of the fishing products.  From this indicator it is possible to evaluate the total value of the fishing products.	Seasonal	APIP	
Terrestrial Vegetation	Diversity of Species	N° of species found on KNEISS Islands		Sfax University  All bibliographic paper ar from Prof. Medail	the study is from 2016

Component	Name	Description	Update Frequency	Data Source	Notes
Touristic and Research activities	Number of tourists per year	Number of authorisations to visit the protected area.	Annual	DGF (Forest Department)	
Touristic and Research activities	Number of the boats	Boats rent for pleasure boats. Fishermen can also rent the boat for touristic and pleasure purposes. Linked to the authorisations given to the boats.	Annual	DGF CRDA	
Urban Areas	N° of Admin. Offices	data available from 2018 to present days	Annual	Raiba Municipality	
Urban Areas	Quantity and Type of Waste	Data available from 2010 to present days	Annual	Raiba Municipality	
Urban Areas	N° of Illegal Urban Constructions	data available from 2018 to present days	Annual	Raiba Municipality	
Urban Areas	Roads Infrastructure	to be developed	episodic	Min. of Equipment Raiba Municipality	
Urban Areas	Urban Plan	to be developed	episodic	Min. of Equipment AFH	
Urban Areas	Number of passengers using trains (public transport)	Number of passengers using trains (public transport). Number of tickets.	Not known. (Possibly annual)	Railway service	
Weather	Number of storms	Storms with or without precipitations. It is in the context of the climate changes, the frequency of these events increased in the last years.	Annual	INM	
Wetlands	Area of wetlands (Ha)	Surface of all the different types of wetlands. In Ha.	Annual	DGF (Forest Department) APAL	Source: APAL
Wetlands	Terrestrial biodiversity	Number of species in danger or threatened, or close to extinction. This classification is used worldwide (check if is Red List).	Episodic or opportunistic	IUCN	