GLOBAL AQUACULTURE ALLIANCE
GOAL 2013 CONFERENCE
PARIS, FRANCE: 7-10 OCTOBER 2013

AQUACULTURE GROWTH OPPORTUNITIES IN NORTH AFRICA

"A STATION IN A GLOBAL JOURNEY"

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1. INTRODUCTION:
1.1 STATUS OF WORLD AQUACULTURE

- This presentation is part of a "Global Journey" for a better future for aquaculture;
- It supports the livelihoods of more than one out of ten people and remains one of the fastest-growing food-producing sectors;
- Within half a century it grew from negligible to comparable with capture production;
- It evolved in terms of technological innovations and adaptation to meet changing requirements;
- FAO data for 2011 register aquaculture landings from all sources to show a record of 83.7 m. t. valued at US$ 140 b. and growing;
- It has possibilities for continued growth but constraints has to be overcome to improve status and trends for sustainable aquaculture.

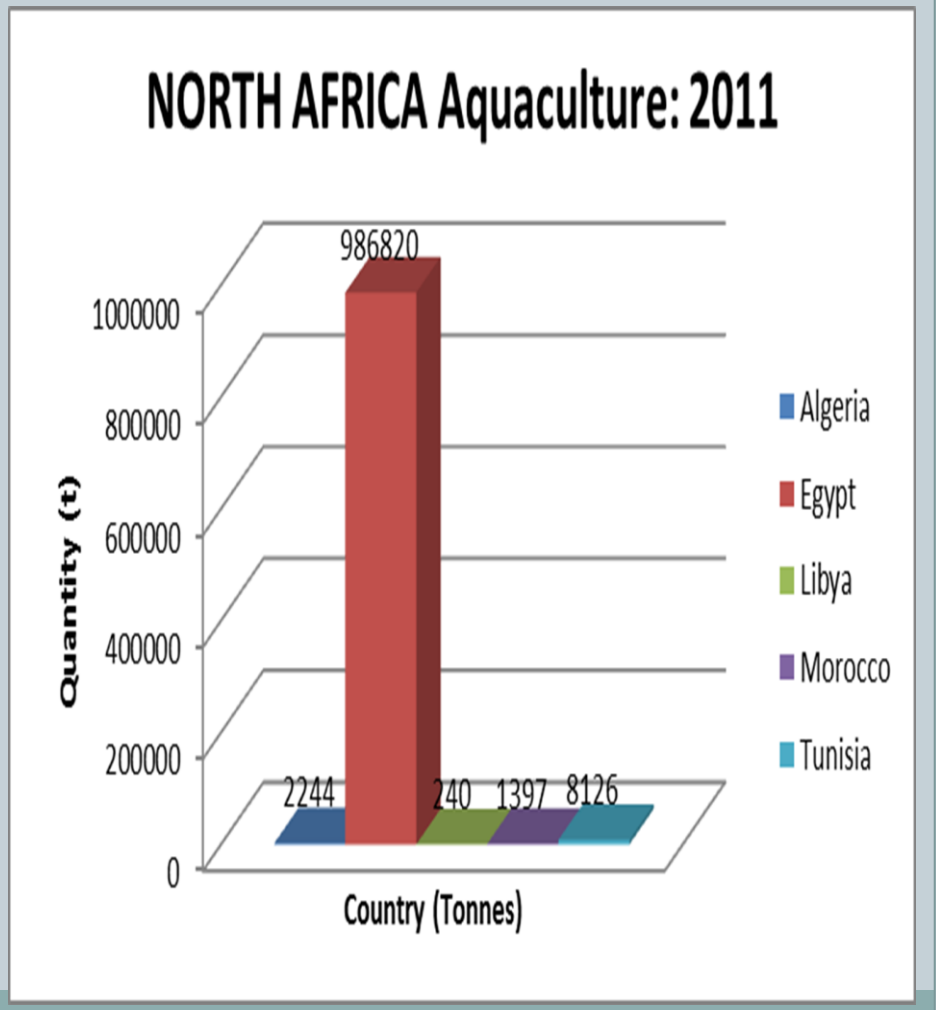
1.2 STATUS OF AQUACULTURE IN NORTH AFRICA: THE REGION

- Five stops will be made in the North Africa "Station" in this "Global Journey";
- These stops are: Egypt, Libya, Tunisia, Algeria, and Morocco;
- NA and much of Sub-Saharan Africa are historically and ecologically different due to the effective barrier of the Sahara Desert;

MAP OF THE REGION (The Station)

NORTH AFRICA FISH PRODUCTION FROM ALL SOURCES: 2009-2011 (Tonnes)

Country	2011	
	Capture	Aquaculture
Egypt	367,266	986,820
Tunisia	91,601	8,126
Algeria	100,256	2,244
Morocco	899,287	1,397
Libya	28,480	240
Year Total	1,486,890	998,827
Grand Total	2,485,717	



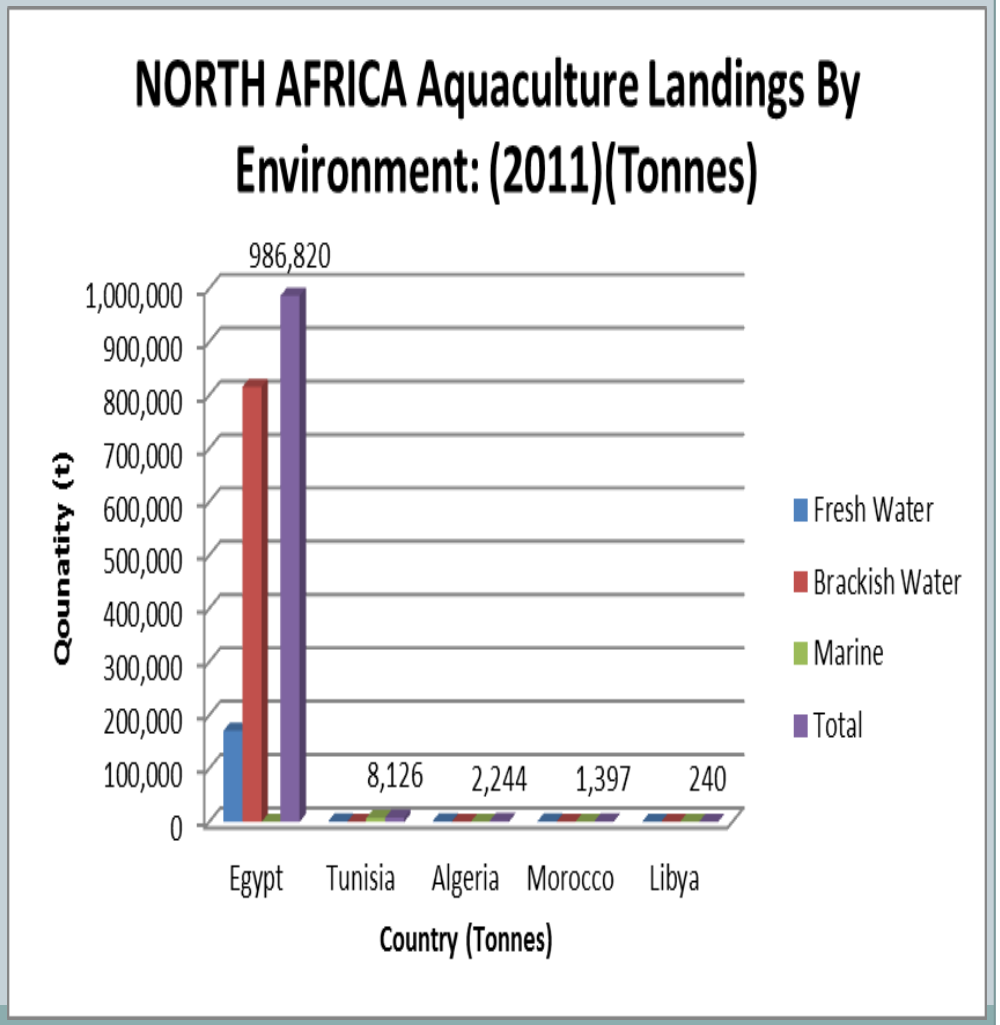
STATUS OF AQUACULTURE IN THE FISHERIES SECTOR IN NORTH AFRICA

- **North Africa** total production from all sources: **2.5 m**. tonnes**:** Aquaculture contributes **35.2 %** of total fish production.

- **North Africa** total aquaculture production: **998,827** tonnes, of which Egypt contributes **98.8%.**

NORTH AFRICA AQUACULTURE LANDINGS BY ENVIRONMENT: (2011)(Tonnes)

1. Brackish water: 81.7 %
2. Fresh water: 17.%
3. Marine: 0.8%

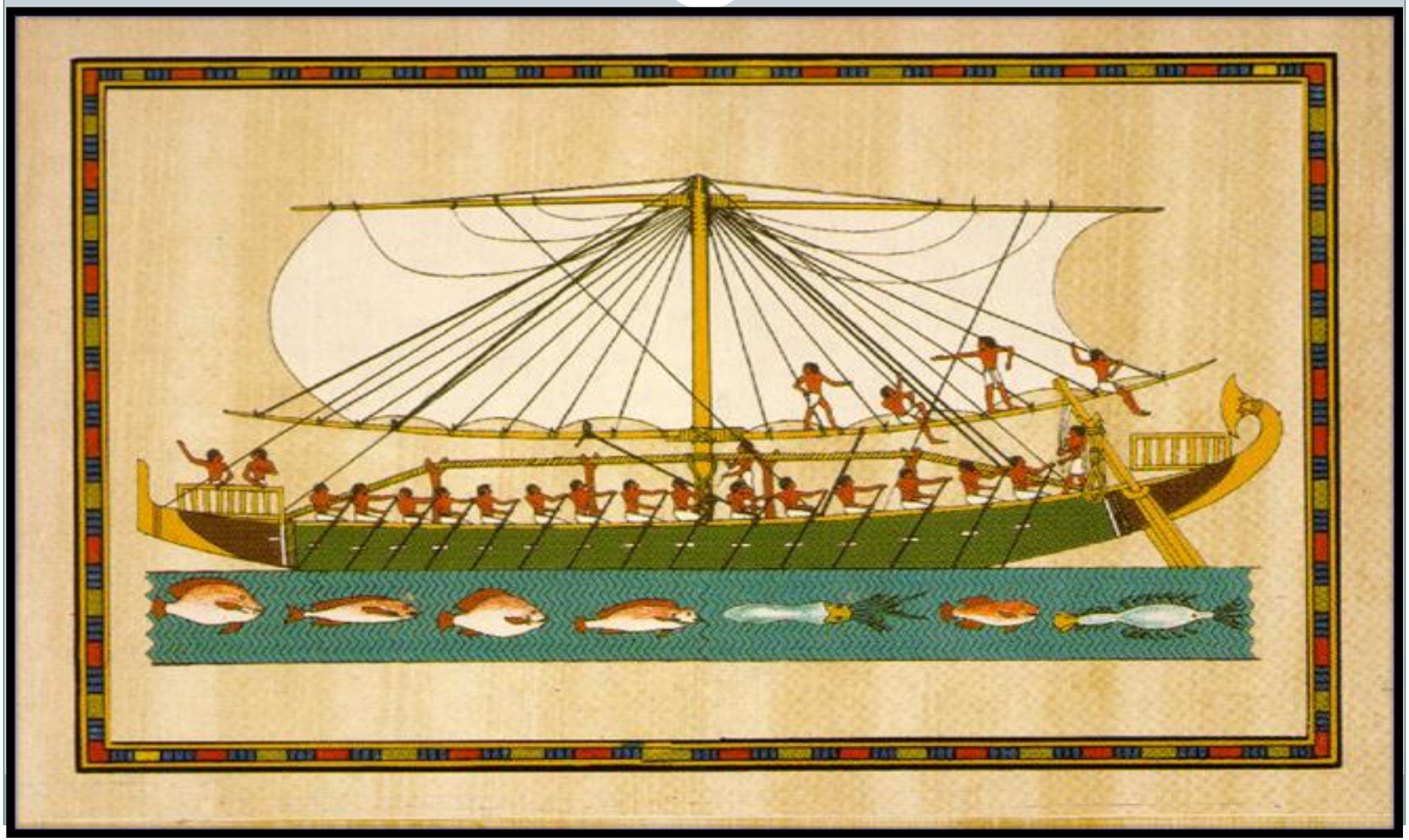


2. AQUACULTURE IN EGYPT (1st Stop)

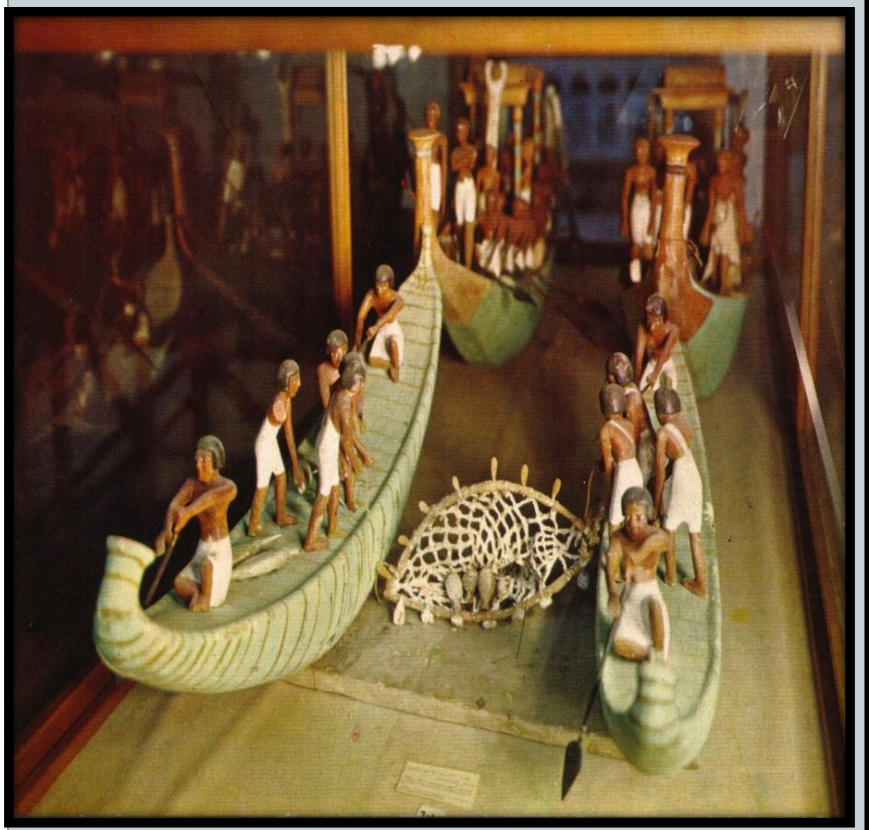
2.1 Current Status:

- Fish farming was practiced since 4000 years ago but matured over the last three decades;
- In 2011 Egypt landed almost 1 million t. from aquaculture from only 57,000 t. in 1994;
- It is the 8th largest world farmed fish producer,1st in Africa and second to China in tilapia production;
- Over 200,000 workers supporting I million families;
- Raised *per capita* consumption from 8.5 kg a decade ago to 17 kg in 2011;
- Provided cheaper animal protein to poorer consumers;
- Government plan increase landings to 1.5 million by 2017;
- Annual growth reached about 15%;

PAINTINGS OF FISH AND FISHING IN PHARAOHS' TIMES



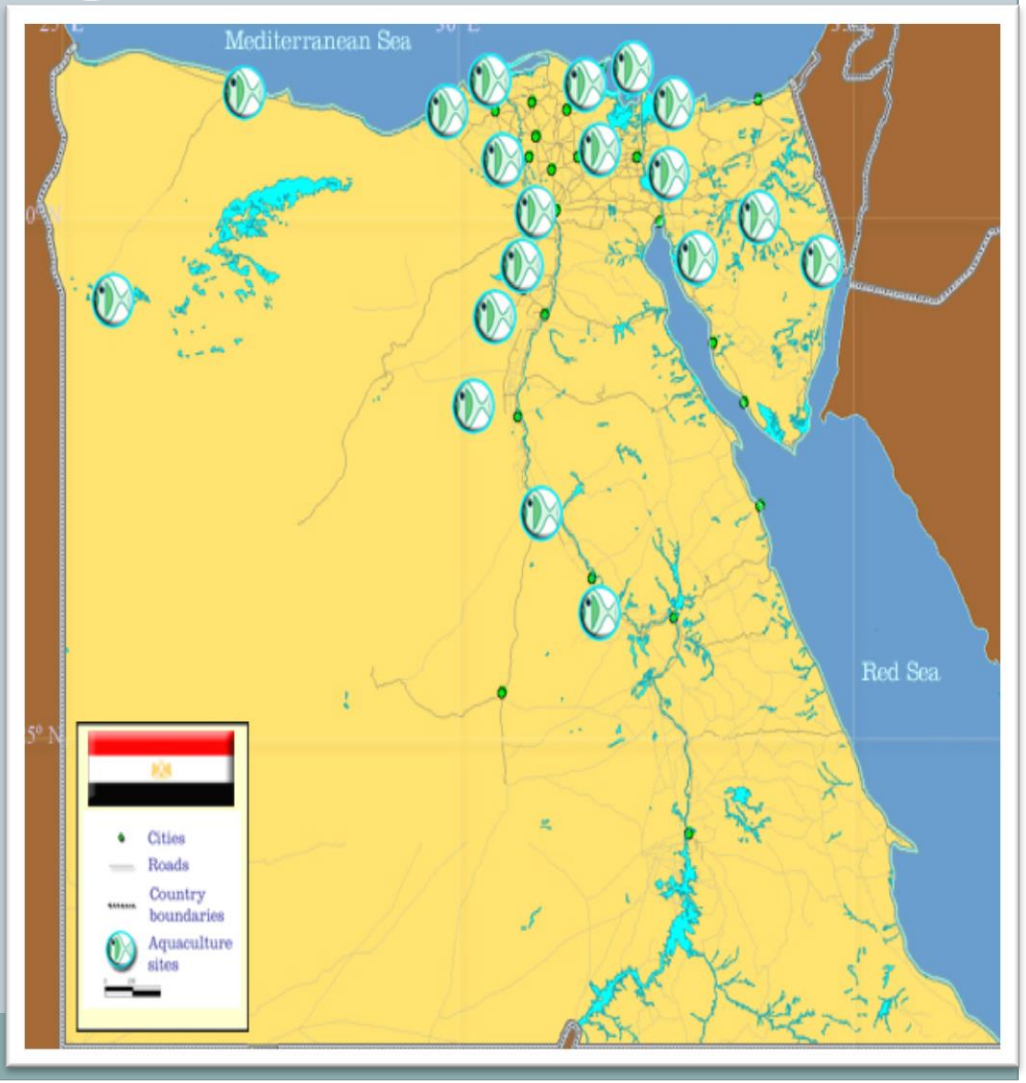
ANCIENT EGYPTIANS FISHING IN THE RIVER NILE



MODERN DAY NILE FISHING IN EGYPT

…AQUACULTURE MAP OF EGYPT…

Egypt identified 71 sites covering 63,400 ha. in three areas declared suitable for culturing marine finfish and/or crustaceans.



AN EGYPTIAN SUCCESS STORY
EL-KERAM FARM ON RECLAIMED DESERT LAND

- A private fish farming company established in 1990 covering 210 ha. comprises of a fully integrated village about 90 km. north of Cairo mixing aquaculture with agriculture and cattle raising housing over 100 families as its workforce.

3. AQUACULTURE IN LIBYA (2nd Stop)

3.1 Current Status:

- Libya in 2011 produced 240 tonnes from aquaculture;
- Aquaculture started in 1970s with farming carp species and catfish. In 1990s Nile tilapia utilizing irrigation water;
- Intensive land based production is in earthen and concrete ponds;
- Hatcheries are distributed along the county's coastline;
- In 1990s mariculture of sea bass, sea bream and mullet in cages in east coast with imported fry;
- Rearing Atlantic tuna started in 2003 but low production;
- The current contribution of aquaculture to the economy is negligible.

4. AQUACULTURE IN TUNISIA (3rd Stop)

4.1 <u>Current Status</u>:

- In 2011 Tunisia produced 8,126 tonnes from aquaculture;
- Geographically Tunisia opens up widely into the sea with 1,300 km. of coastline;
- Fisheries important in socio-economic terms as source of food;
- Aquaculture began in 1960s with shellfish (pacific cupped oysters) farm in the north, later several more such farms;
- Shellfish farmed using breeding tablets and floating lines in north lagoon;
- Both marine and inland species are farmed: sea bass, bream, carps, grey mullet, and tilapia;
- Several blue-fin tuna fattening projects with fry from the wild; and
- Aquaculture has high potential to land 20,000 t./year, 2011 only 8,126 t.

…AQUACULTURE IN TUNISIA

4.2 Growth Opportunities

- The government has national Master Plan for aquaculture;
- It encourages and provides incentives to build up aquaculture infrastructure;
- Identified suitable sites for marine, brackish and Inland waters for farming;
- Exports to EU encourages growth; a
- Foreign investors equity share raise from 50 % to 66%.

5. AQUACULTURE IN ALGERIA (4th Stop)

5.1 Current Status:

- In 2011 Algeria produced 2,244 tonnes from aquaculture;
- Farming in brackish and fresh waters for sea bream, bass, mullet, eels, sole; clams, cupped oysters, and shrimps;
- Inland impoundments for Chinese carp species and barbel;
- Shellfish culture and Med. mussels by private sector;
- Government projects are demonstrations to private sector;
- Production is 90% from freshwater farming;
- Aquaculture in take-off phase through:
    i. Freshwater fish farming and shrimp breeding trials;
    ii. Experimental shellfish production in brackish lagoons;
    iii. Development of restocking for commercial inland aquaculture; and
    iv. Encouraging private sector to engage in aquaculture.

6. AQUACULTURE IN MOROCCO (5th Stop)

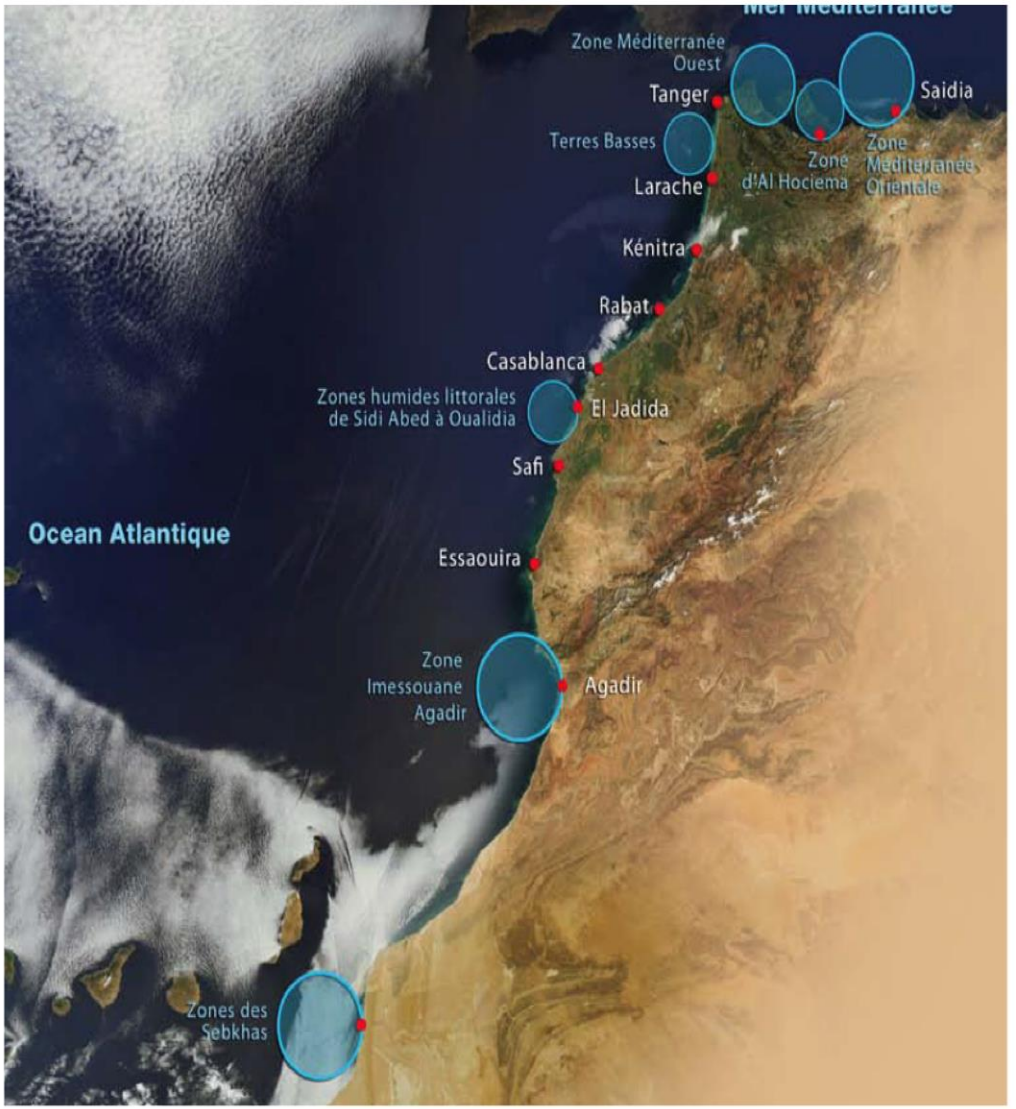
6.1 Current status:

- Morocco produced 1,397 t. from aquaculture in 2011;
- Fisheries makes substantial contribution to national economy but so far aquaculture is negligible;
- Aquaculture began over 50 years ago with marine culturing of cupped oysters along the Atlantic coast and later inland farming;
- In 1997 a survey with FAO estimated aquaculture potential;
- In 1980s intensive sea bass and bream farmed only for export to EU;
- There are 3 types of marine aquaculture:

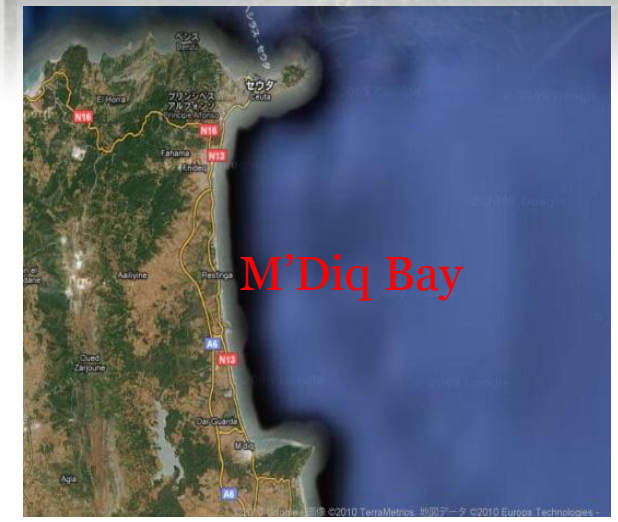
i. In protected lagoons and estuary environment;
ii. In basins replenished with pumped seawater; and
iii. In cages in open sea for sea bass, bream and meagre species.

…AQUACULTURE MAP OF MOROCCO…

- Cupped oysters raised in beds in intertidal areas;
- Culturing carp species, eel and restocking;
- Different types of aquaculture are regulated;
- Good quality of Atlantic waters
- Suitable environment.



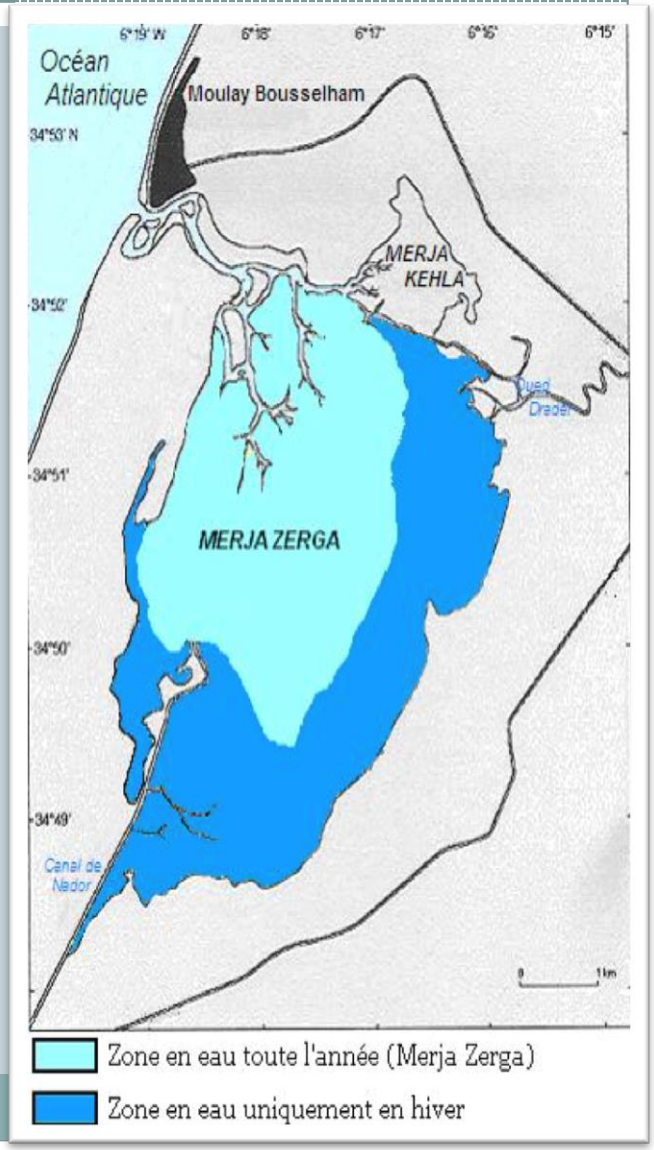
SELECTED SITES FOR MARINE AND INLAND AQUACULTURE PROMOTED BY MOROCCO



...AQUACULTURE IN MOROCCO...

SUCCESS STORY IN MOROCCO: TECHNOLOGICAL TOOL FOR AQUACULTURE

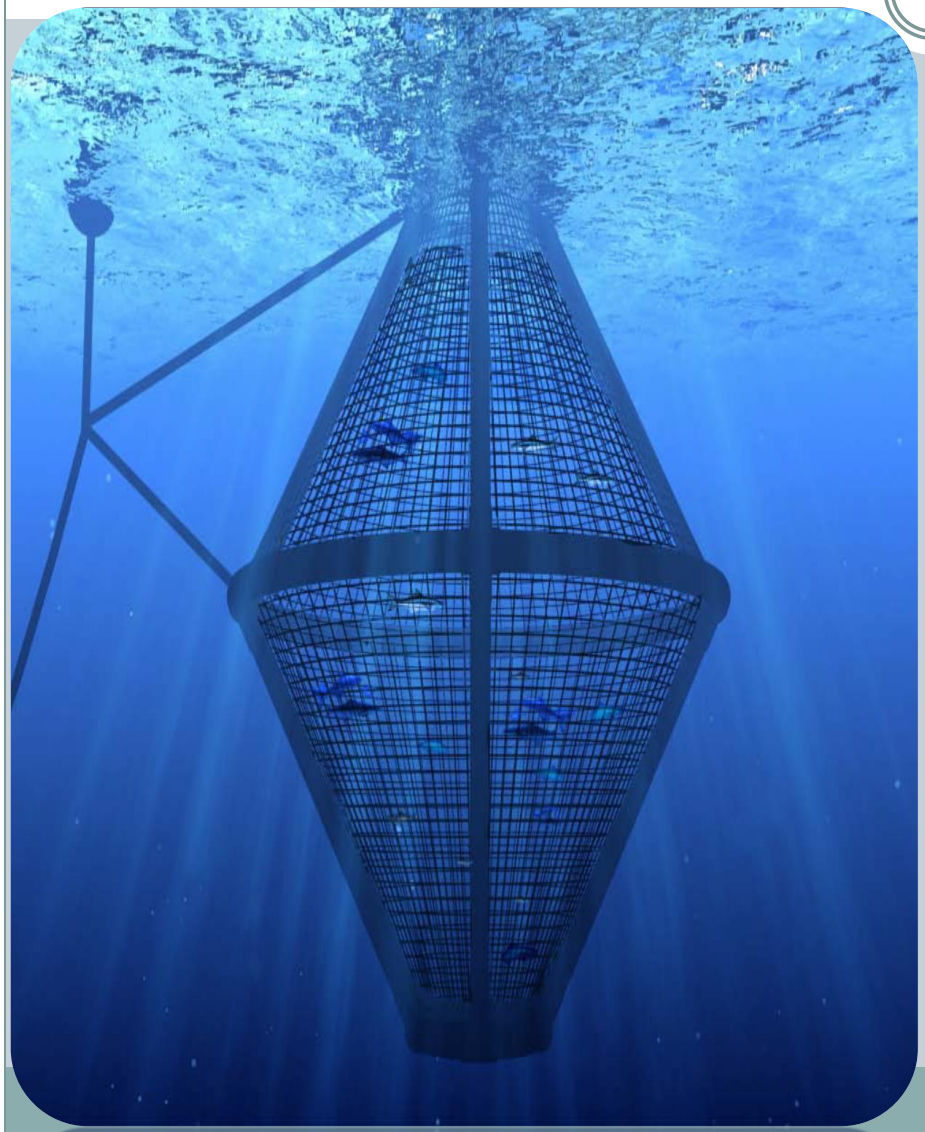
- To eliminate guesswork in decision making in selecting site and species GIS satellite imagery was used in Moulay Boussellam Merja Zerga lagoon: First time in North Africa.
- It allow to guide and explore sites in defining potential and prevent unsuccessful breeding trials and other benefits;
- It helped interpolate thematic maps from data collected; and
- Information concluded that site is feasible to culture shellfish.



OYSTERS & BIVALVES ON DISPLAY IN CASABLANCA FISH MARKET

ONE OF SEVERAL TUNA FATTENING PROJECT IN NORTH AFRICA

EXAMPLE OF OPEN SEAS CAGES



7. FACTS, CHALLENGES AND CONSTRAINTS

7.1 Facts:

- The future of aquaculture in the North Africa Region is bound to grow and progress because of the following facts:
  - Population growth is assured especially in countries that traditionally produce cheaper species such as tilapia for mass consumption;
  - Demand for more fish at affordable prices expected to continue;
  - Measures for responsible fisheries are taken to combat declining trend in capture fisheries;
  - Sustainable and environment friendly aquaculture is expanding in almost all countries of the region;
  - Aquaculture research in introducing potential species is on-going;
  - New international markets for farmed species are opening up and expanding;

…FACTS, CHALLENGES AND CONSTRAINTS…

7.2 Challenges:

- In order to deal with the facts on the future of aquaculture production, processing and consumption in North Africa, it will be necessary for the countries in the region to meet the following challenges:
  - Successful implementation of measures taken to combat and reverse the declining trend in capture fish production;
  - Strengthening laws and regulations governing aquaculture;
  - Assure availability of fry by establishing hatcheries for year-round supply to farms;
  - Manufacturing of sufficient home grown main ingredients of specialized fish feed;

…CONSTRAINTS…

7.3 Constraints:

With apparent opportunities for growth, several constraints, which vary by country, require attention. Some of these are:

- Quality of inland and coastal waters;
- Shortage of research and development of indigenous and imported new species as well as adaptation of new culturing technologies;
- Necessary actions to eliminate constraints in inputs, quality of production, post-harvest losses and marketing;
- Competition with agriculture, other coastal activities, land use, fry mortality, enforcement of regulations, feed supply, trained manpower, etc.
- Efficient institutional adjustments for good governance;
- Price fluctuations on the international market for farmed products;
- Relatively high input costs; and
- Improvement and expansion of statistics and reporting in order to have a full understanding of the sector.

MAIN FISH, SHRIMPS, SHELLFISH AND OYSTERS FARMED IN NORTH AFRICA

Catfish

Sea bream

Sea bass

Meager

Common carp

Scallop

Mussel

Tilapia

Oysters

Tiger Shrimp

Japanese Shrimp

NORTH AFRICA FISHERIES ADMINISTRATIONS

Country	Main Official Bodies in NA Responsible for Fisheries
Egypt	Ministry of Agriculture; General Authority for Fish Resources Development (GAFRD)
Libya	Ministry of Marine Wealth; Marine Biology Research Center (MBRC)
Algeria	Ministry of Fisheries and Fish Resources
Tunisia	Ministry of Agriculture, Water Resources; Directorate-General of Fisheries and Aquaculture.
Morocco	Ministry of Fisheries; National Fisheries Office (ONP); National Agency for the Development of Aquaculture (ANDA); and National Institute for Fish Research (INRH).
Supportive Regional Bodies	1. General Fisheries Commission for the Mediterranean., (GFCM), Located: FAO, Rome, Italy; 2. INFOSAMAK Center, Located: Casablanca, Morocco.

8. CONCLUSIONS:
Aquaculture Growth Opportunities

- On the **current status** and **growth opportunities** North Africa Station of the "Global Journey" it may be concluded that:
- With exception of Egypt, aquaculture in NA countries is in the take-off stage;
- NA Governments encourages and supports growth to meet increasing demand for local consumption and for export;
- High demand by EU to import highest valued seafood products;
- National and foreign entrepreneurs alike are invited to invest;
- NA current population about 177 m. people. UN projects growth to 215 m. by 2030 and to 242 m. by 2050.
- With population growth sustainability is required for generations;
- Countries of NA possesses untapped aquaculture possibilities;
- Aquaculture growth help develop infrastructure building especially in rural areas;

…MORE CONCLUSIONS…

- Growth opportunities may take several forms:
  i. In fresh, brackish and marine waters;
  ii. Capture-based aquaculture by collecting seeds from the wild and breeding into marketable sizes;
  iii. Fish fattening high value species as blue-fin tuna and shellfish;
  iv. Aquaponics: farming with aquaculture and also polyculture;
  v. Off-shore aquaculture on the high seas; and
  vi. Establish processing plants for value added seafood products.
- With these conclusions all are invited to "Join the Journey".


THANK YOU
&
BON APETITE