



ALLOCATED ZONES FOR AQUACULTURE IN TURKEY



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Workshop on Allocated Zones for Aquaculture (AZA) WGSC-SHoCMed1
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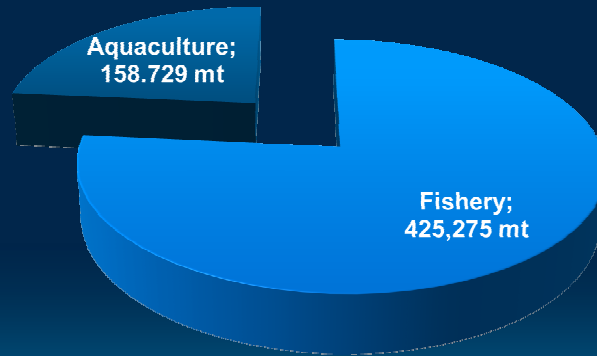
AQUACULTURE POTENTIAL OF TURKEY

Resources	Numbers	Area (ha)
Natural Lakes	200	906.118
Dam Lakes	206	342.377
Man-made Lakes	952	27.032
Seas (total surface)	4	24.607.200
TOTAL	1.362	26.000.000

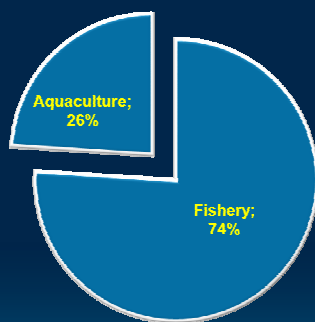
Additional, 33 rivers 177.000 km in length and coastal line 8.333 km
Turkey has 2nd longest coast line in the Mediterranean

FISHERIES PRODUCTION IN 2009

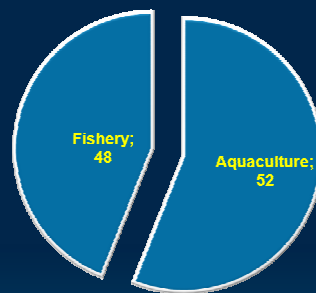
(623,191 mt)



CONTRIBUTION OF AQUACULTURE IN FISHERIES IN 2009



Volume

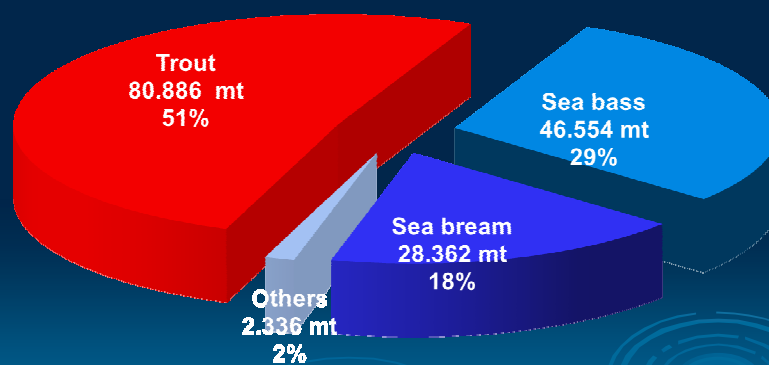


Value

AQUACULTURE PRODUCTION BY SUB-SECTORS IN 2009

Inland Aquaculture	66.557 mt
Trout	75.657
Carp	591
Marine Aquaculture	85.629 mt
Trout	5.229
Sea bream	28.362
Sea bass	46.554
Mussels	89
Other	2.247
TOTAL	158.729 mt

AQUACULTURE PRODUCTION BY SPECIES IN 2009

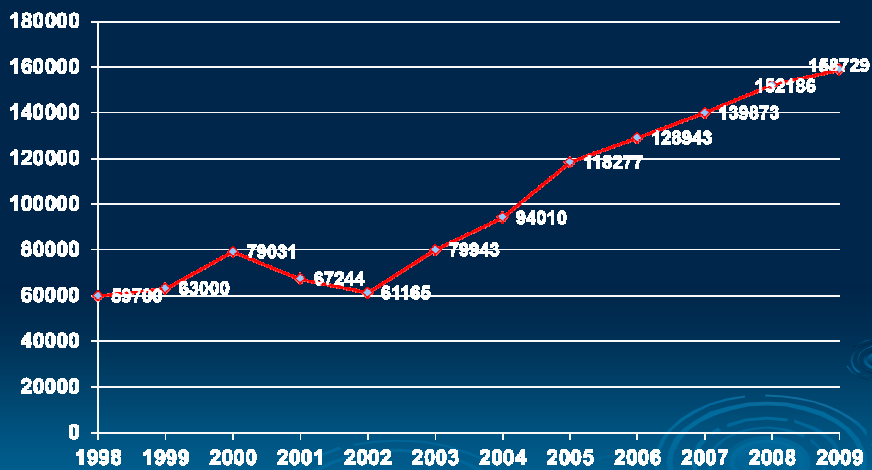


FISH FARM NUMBERS AND CAPACITIES IN 2009

Farm type	Number	Capacity (tons/year)
Inland fish farms	1,499	104,629
Marine fish farms	356	134,121
TOTAL	1,855	238,750



AQUACULTURE GROWTH TREND IN THE PAST DECADE



AQUACULTURE MANAGEMENT

According to Article 13 of the Law, the procedures and principles related to aquaculture are set by the Aquaculture Regulation, which was issued in 2004 and amended in 2005, 2007 and 2009.

The Regulation covers and sets out rules for the following issues:

- ✓ Site selection for inland and marine fish farms
- ✓ Application and evaluation procedures for aquafarming licenses
- ✓ Approving the projects and issuing licenses
- ✓ Improving production capacity, species etc, cancellation site changes and sales
- ✓ Importing brood fish, egg and fry,
- ✓ Compulsory technical staff employment,
- ✓ Fish health management
- ✓ Environmental impacts and protection
- ✓ Monitoring and control of farming activities
- ✓ Fish welfare

INSTITUTIONS INVOLVED IN THE AQUACULTURE SECTOR

The other public institutions related with aquaculture which support MARA are:

- ✓ Ministry of Environment and Forestry (EIA & DG of State Water Works)
- ✓ Ministry of Culture and Tourism
- ✓ Ministry of Finance (DG Incomes)
- ✓ Ministry of Interior Affairs (Coastguard and Gendarmerie)
- ✓ Ministry of Health (hygiene and the sanitary of fish and fish products)
- ✓ Ministry of Public Works and Settlement (Shore Law)
- ✓ State Planning Organization (DPT)
- ✓ Under-Secretariat of Foreign Trade
- ✓ Under-Secretariat of Customs
- ✓ Under-Secretariat of Maritime (Maritime navigation)
- ✓ Turkish Statistical Institute (TURKSTAT)
- ✓ Turkish Standards Institute (TSE)
- ✓ Municipalities (Quality control & conservation in the local open markets)
- ✓ Agricultural Bank (Credits)

REGULATIONS RELATED AQUACULTURE MANAGEMENT, ALLOCATION OF ZONES, EIA AND MONITORING

- Fisheries Law (MARA - 1982)
- Environmental Law (MEF - 2006)
- Aquaculture Regulation (MARA - 2004)
- Environmental Impact Assessment Regulation (MEF - 2002)
- Regulations Governing the Control of Water Pollution (MEF - 1983)
- Notification on Defining Sensitive Enclosed Bays and Gulfs Areas in Coastal Waters where Fish Farms shall not be set up (MEF - 2007)
- Communiqué on the Monitoring of Fish Farms established on the Marine Environment (MEF -2009)

MARA : Ministry of Agriculture and Rural Affairs
MEF: Ministry of Environment and Forestry

IDENTIFICATION OF MARICULTURE ZONE

- **First commercial marine aquaculture was started** with sea bream and sea bass in closed and sheltered bays in Mugla City in **1985**.
- **For the first time, marine aquaculture zones were determined by MARA** along the all coastlines in **1988** and were provided moving of sea farms in these zones. However, current allocated zones had been started deficient for new applications because of rapid developments of culture technique; cage-made, fish feed technology.
- Therefore, **studies on determination of potential aquaculture zones were reviewed by order of 1993, 1998, 2000 and 2008** because of the circumstances of aquaculture which were developed and alternated.
- **After new Environmental Law come into force, new aquaculture zones were determined once again with consensus of all related institutions** according to the Environmental Law and Notification on Site Selection for Marine Fish Farms. After The Environmental Law was put into practice for implementing Articles related fish farms, **all inshore sea farms were moved to new offshore areas**.

PRINCIPLES FOR IDENTIFICATION OF MARICULTURE ZONES

- ❑ **Suitability and possibility of mariculture**
 - ✓ *Water quality*
 - ✓ *Psychical and chemical conditions*
- ❑ **Sensitive area parameters and criteria**
 - ✓ *Water depth* ≤ 30m
 - ✓ *Distance from coastline* ≤ 0.6 mile
 - ✓ *Current speed* ≤ 0.1 m/sec
- ❑ **Protection status**
 - ✓ *Special protected areas*
 - ✓ *Sites of archeological and historical*
 - ✓ *Wild life protected areas, etc.*
- ❑ **Other coastal uses**
 - ✓ *Tourism, urbanization, marine transportation, fishing, recreation, etc.*

ALLOCATION OF ZONES FOR MARICULTURE

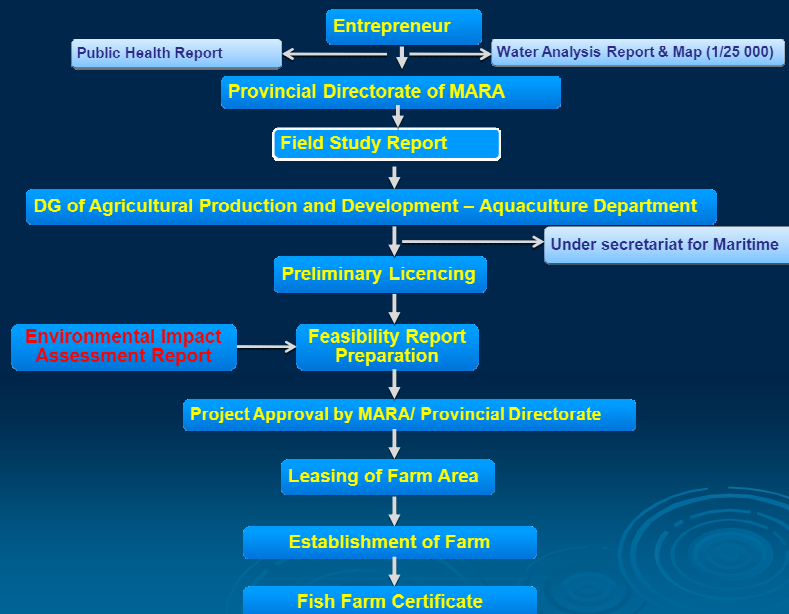


The new mariculture zones entered into force as part of the overall coastal zone plans and management in 2008

SITE SELECTION CRITERIA FOR SEA FARMING

- ✓ *Conflicting uses of area*
- ✓ *Depth profile*
- ✓ *Exposure to wind*
- ✓ *Fetch*
- ✓ *Currents*
- ✓ *Maximum and significant wave height*
- ✓ *Water temperature*
- ✓ *Salinity*
- ✓ *Dissolved oxygen concentration*
- ✓ *Pollution*
- ✓ *Phytoplankton and zooplankton occurrence and distribution*
- ✓ *Potential danger of red tides, plankton blooms, biofouling*
- ✓ *Predators - crabs, fish, birds, seals, etc.*
- ✓ *Distance from sensitive flora and fauna*
- ✓ *Distance from other fish farms*
- ✓ *Interaction with protected species*
- ✓ *Accessibility to the site – roads, transportation, airport, port, etc.*
- ✓ *Infrastructure - facilities, security, communication, electricity, freshwater*
- ✓ *Potential for expansion - availability of adjacent area*

LICENSING PROCEDURES FOR AQUACULTURE INVESTMENTS



ACTIVITIES FOR SUSTAINABLE DEVELOPMENT

✓ Effective participation of international organisations and activities

- FAO
- OECD
- ICCAT
- EIFAC
- JICA
- EUROFISH
- GFCM



✓ Carrying out projects as a national, regional and international level

- Development Project of Balkans and Central Asian Countries (FAO SEC)
- The Project on Culture and Stock and Enhancement of Sturgeon (TCP – FAO)
- Flatfish Culture Project (JICA)
- **Developing a Roadmap for Turkish Marine Aquaculture Site Selection and Zoning Using an Ecosystem Approach to Management (FAO – TCP)**
- **National Project on Determination of Environmental Impacts of Fish Farm to the Marine Ecosystem**

DEVELOPING A ROADMAP FOR TURKISH MARINE AQUACULTURE

FAO-MARA 2008

TCP/TUR 3101 Project



APPROACH: IMPLEMENT EAA

(Initial trigger provided by the FAO TCPF project)

➤ Activities

- **Workshops with broad stakeholders participation**
 - Defining relevant spatial scale/ecosystem boundaries
 - Identification of relevant issues (e.g. ecosystem components and processes)
 - Identifying potential solutions and responsible entities
- **Training workshops for farmers**
- **A draft pilot zoning plan for mariculture zones with short, medium and long term options**

➤ Outputs

- **A road map to implement the Strategy**

IDENTIFYING THE PROBLEMS

- ❑ **Institutional/administration issues (35%)**
 - Coordination gap between Ministries, some legislative conflicts, cumbersome licensing and permitting process, no integration of aquaculture in coastal management programs and lack of ICM
- ❑ **Site selection and logistics (26%)**
 - need to identify new sites
 - need to agree on environmental criteria and estimate carrying capacity,
 - there are insufficient land facilities, jetties etc.
 - new more expensive technologies will be needed, difficult to adopt by small farmers
- ❑ **Conflicts with other users (39%)**
 - Not always clear, environmental issues not well documented, environmental requirements are not equally relevant for other users (e.g. summer houses in the coast)

OUPUTS AND OUTCOME

- An agreed strategy (EAA) for the development of mariculture
- A pilot aquaculture zoning plan
- A road map for the implementation of the EAA
- Trained farmers
- Dissemination brochures about marine aquaculture in Turkey and the EAA



DETERMINATION OF ENVIRONMENTAL IMPACTS OF FISH FARM TO THE MARINE ECOSYSTEM

(TUBITAK–Technological Research Council of Turkey)

Project Partners

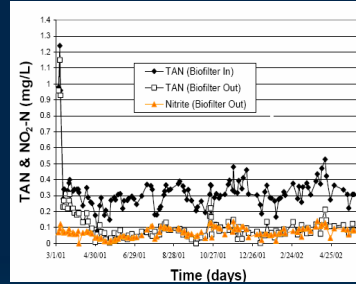
- Ministry of Agriculture and Rural Affairs
- Ministry of Environment and Forest
- TUBITAK Marmara Research Center
- Black Sea Technical University
- Rize University
- Çanakkale 18 Mart University
- Federation of Aquaculture and Fisheries



DETERMINATION OF ENVIRONMENTAL IMPACTS OF FISH FARM TO THE MARINE ECOSYSTEM

AIM OF PROJECT

- ❑ To determine of environmental effects of fish farms on marine ecosystems.
- ❑ To develop continuous real time and central control systems
- ❑ To serve as a pilot study for other similar projects along the coastal regions of Turkey.
- ❑ To demonstrate interactions between sectors



CONCLUSIONS

- ✓ World total fisheries production was 159 million mt and 40% comes from aquaculture in 2008.
- ✓ Aquaculture is most growing food production sector in the World and Turkey in the past decade.
- ✓ Turkey has great potential for aquaculture developments with inland and marine resources.
- ✓ Total fisheries production in 2008 was 646,310 mt and contribution of aquaculture was 24% as a volume, and 44% as a value in total fisheries production.
- ✓ There are 1.885 fish farms in 2009 with 238,756 mt per year including 1,499 inland fish farms and 356 marine fish farms in Turkey.

CONCLUSIONS (Cont.)

Although it is very young, there have been showed very important improvements in aquaculture sector:

- ✓ In 2002-2008, the increase on aquaculture production, as a volume was 149%.
- ✓ Turkey now has a 25 % share of the European sea bream and sea bass market.
- ✓ Turkey is the 3rd fastest growing country in the World in the aquaculture.
- ✓ Turkey has occupied first place in trout production among European countries.
- ✓ Approximately 25.000 people are employed in the sector.
- ✓ Latest developments in the aquaculture sector place Turkey in an important position both in the Mediterranean basin and among the EU countries

Offshore sea farming (sea bass & sea bream)



Barge system in offshore sea farm



Feeding in offshore sea farm



Management and monitoring of offshore sea farm



THANKS FOR YOUR ATTENTIONS