Feasibility study

Fishery sector in Croatia

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FISHERY SECTOR IN CROATIA

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Abstract: CroNoMar's mission is to participate in commercial development of new modern, innovative and sustainable products, processes, and services in marine sectors in Croatia. CroNoMar has strong links and opportunity to do networking between the fishery sector in Norway and Croatia. Intention of this feasibility study was to take a "bird's eye view" in the whole fishery sector in Croatia. The aim of this study was to identify possibilities and challenges in order to improve efficiency and competitiveness of the sector and to identify possibilities for future cooperation's between Croatia and Norway. Based on collected data the following areas have been analyzed: - present situation of fishery sector in Croatia,
- Marine fish catch and aquaculture
- Fishing fleet
- Current activities related to coastal infrastructure, etc.
Recommendations of this feasibility study can assist this sector in order to improve sustainability and commercial potentials, to develop more international cooperation, knowledge transfer, and experience exchange. That can be achieved by the
- Quality handling systems for fish onboard fishing vessels or at land
- Professionalizing the processing
- Promoting of value chain from first-hand sales to consumer-markets for fresh fish and shell products
- Development and adaption of fishing, etc.

FISHERY

CONTENT

1. INTRODUCTION

The main objective for CroNoMar is to identify interesting business opportunities, and to try and implement them in business-relations together with interested cooperating partners in both Croatia and Norway.
CroNoMar's goal is to identify potentials for business improvements, and markets for new products and services in marine and maritime sector, and to participate in processes to commercialize these new business propositions.
The end-result shall be prosperous new jobs and activities in Croatia.
CroNoMar is spending considerable resources on stimulation activities and studies in order to identify and generate deal-flow of new commercial ideas and business opportunities in Croatia.

The types of stimulation activity will be:

- PR and publicity activities to market our services and contribute to an improved business oriented culture and attitudes in the region. Establish good relations to relevant public and private development agencies where potential idea-holders seek assistance and contribution
- Proactively towards national R&D-institutes, educational institution and students from the region to be trained in entrepreneurship and look for maritime relate business opportunities during their studies
- Establish proactive cooperation's with existing business communities, national and regional public authorities, with financial and knowledge development organizations, branches, clusters, unions, associations, etc, in order to highlight non-released potentials and opportunities for new businesses and new business models, and jointly take new ideas into:
    - Feasibility studies
    - Pre projects
    - Development project

for further development and evaluation as new business opportunities
The prime objective from CroNoMar with feasibility studies is two-sided:

- Identify new marine and maritime business concepts that are relevant as new competitive products and services to be produced and marketed from Croatia.
- Identify cooperative partners in both Croatia and Norway that have interest and capabilities to be our partners in such commercialization.

A secondary result is that these studies very likely will identify considerable improvement potentials by upgrading the existing structure and operational focus of integrated business -branches and –sectors. Such business opportunities have the greatest potential but are very demanding and can only be achieved by long term close cooperation with all parties from individual private companies and local and national agencies and policy makers.
This feasibility study highlights the **fishery and aquaculture sector** at the Dalmatian coast and includes short view of following areas:

- Regulations and motivations for a sustainable fishery and aquaculture sector and further steps in that area
- Fisherman and fleet
- Fish processing industry
- Aquaculture
- Highlights improvements and expansion possibilities, etc.

Recommending on areas where CroNoMar can contribute with competence, experience and other resources seen both from CroNoMar and the relevant Norwegian sector.

2. PRESENT SITUATION OF FISHERY SECTOR IN CROATIA

The whole Adriatic Sea includes 138.595 km2 (long 783 km470Nm, wide 170 km 86Nm; salinity 38)
The Croatian part of the Adriatic Sea includes 56.964 km2 and is divided as follows:

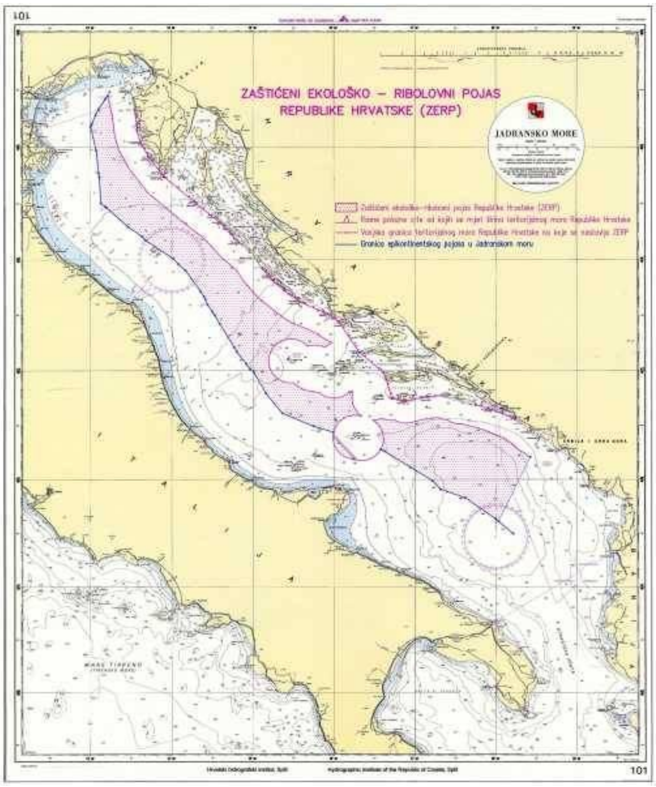
- Coastal Sea of Croatia is part of the Sea where Croatia has sovereignty 31.757 km2 and that includes:
  Croatian inner sea area (12.461 km2) - up to the outside line of the islands
  Croatian territorial sea (19.296 km2) – from outside line of the islands including 12NM towards middle line
- Croatian protected biological and fishery area - ZERP includes 25.207 km2 – marine area in the Adriatic Sea from the outer limits of the territorial sea in the direction of the open sea to its outer limits permitted by general international law.

The length of the Croatian coast in total is 6.278 km with 1.242 islands.

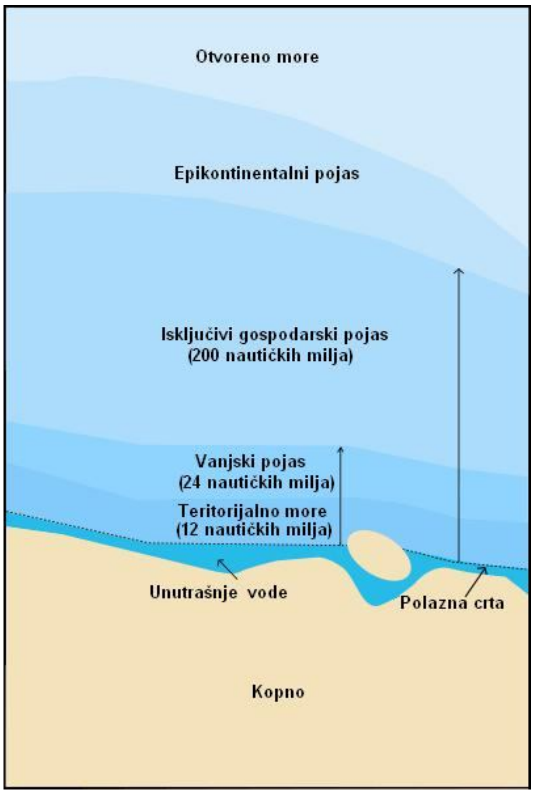
- Length of coastline is (dužina priobalja) 1.880 km
- Length of the island`s cost is (dužina otočne obale) 4.398 km

(aprox. depth 252m , aprox. temperature in winter is 5-15 C, in summer 22-25C, tide can be from 40cm up to 1m,clarity 56m)

Example: ZERP



Example: Marine belts according to the international law and the starting line



The main objectives of the Croatian fisheries policy are:

- Strengthening and restructuring of the fishing sector as a whole, including fishing fleet, fish farming and fish processing industry
- To insure the long-term sustainable management of fishing resources in accordance with fishing possibilities and with increasing competitiveness of producers through the adoption structural and trade mechanisms
- The development of aquaculture in order to explore and utilize the marine biological capacity with the highest environmental and quality standards
- Improving the processing and quality handling of fish in order to improve value and payback for the catch and cultured fish products
- Establishing an organization for trade of fish and fish products
- Development of infrastructure and logistical support of the fisheries (ports, dock, ship berth, transport, etc.)
- Strengthening organized associations and management of fishing
- In the period between 2008 and 2011 the priority measures are aimed at:
  - Strengthening of aquaculture activities
  - Reconstructing the fleet
  - Reconstructing fish industry

An important segment is modernization of ports / vessels /fish processing/ market with aim to achieve better conditions of storage, refrigeration, packing, processing/ management and other activities. And to fulfill hygiene standards in order to obtain improved quality products.

(Source: Operational Program for Fisheries, Zagreb 2008, the Ministry of Agriculture, Fisheries and Rural Development Administration-Fisheries)

2.1 Legal perspective

Croatia is in process of developing a new law related to fishery. That new law will be aligned with EU standards. The aim is to achieve a sustainable fishery sector by better management of fish-stocks/biomass reserves and by management and monitoring of catch volumes and quality.
The new law is planned to be implemented by including the following measures:

- Law on structural application – new way to organize the whole sector
- Law on sea fisheries

The new fishing law will be implemented through the following measures:

- Measures of biological control and monitoring of biomass capacities of the sea
- Measures of regulation of fishing
- Measures of fishing fleet management
- Surveillance of fishing; introducing high standards with necessary infrastructure
- Measures for control of farming activity
- Establishing a system for supervision and control

Fishermen are going to be divided into 2 main categories – professional and non-professional.

1) Professional fishermen
2) Non – professional fishermen will include: Small coastal fishermen, recreational fishermen, sports fishermen, fish farming

The intention of the new law is to reduce non professional fishery to a minimum The new law is attempting to achieve a joint cooperation of all parties involved in monitoring, management and control of the fishery sector in order to align positively all resources. . By existing law no new professional fishing licensed are planned to be issued. Present national strategy and framework for regulating fishery is from year 2002.

2.2. International relations

Sharing of common resources in the Adriatic Sea with neighboring countries is a continuous challenge. This applies in particular with Italy. In relations between Croatia and Italy, there is a significant difference in exploitation of the Adriatic Sea.
Italy is dominating some 80% of the whole territory with a 10 times larger fleet, and Croatia some 20% of it. In catch volume the Croatian fishery is on order of 50% of the Italian one (the Italian catch is around 120 000 t/y and Croatian one around 50000 t/y). Italian fishermen catch some 50 000t/y of demersal (bottom) species and Croatians some 5-7000 t/y. Over the last years both the Italian catch and fleet is reduced.
Agreements have been signed between Croatia and EU related to the capacity of the fishing fleet in Adriatic Sea. That capacity shall be determined by number of inhabitants, history, etc more than the size and location of biomass at the individual country's territory. This gives Italy a significant advantage with respect to access to the resources in the Adriatic Sea. In relation to EU Croatia is not allowed to issue an economical zone. It s regarded as a difficulty to apply quota system in the Adriatic Sea because all fisheries are based on very mixed and young resources.

3. MARINE FISH CATCH AND AQUACULTURE

3.1. STATISTIC

In 1999 the Croatian catch of fish in total was 20.000t/y were of 90% were pelagic species.
In 2008 the catch was 50.000t/y and out of it was 83% pelagic fish, 12% white fish and 5% other species. There are some indications that catch numbers should be increased by some 8.00t/y due to catch sold on the "grey market".

There are about 400 different fish species in the Adriatic sea and 100 of them are economically significant. Most important of them are:

1)small oily fish (pelagic): about 5kn/kg
– pilchard (srdela), anchovies (inćun), sprats (papalina)
2) white fish: about 20kn/kg; the expensive one-for restaurant-about 150-200kn/kg
– hake (oslić), mullet (trlja)
3) Norway lobster
- shrimp
4) fish and shellfish from farming
- sea bass (brancin), gilthead (orada), tuna, mussels (dagnje), oysters

In 2008 the total catch of marine fish was 49.011t

- 85% of that was in pelagic fish

Total catch of marine fish should be increased by "grey" volumes of fish on non registered market :

- Aprox. 6,000t white wild fish and aprox. 2,000t extra white wild fish for restaurants=8,000t

(Source: Mr. Lav Bavčević, Croatian Institute for Agricultural Advisory Service)

Production of the fish farming in 2008 was 12.000t (value:120 mil €)

- Tuna fish 5,000t (value: 80mil €)
- Sea bass 2,000t
- Gilthead 2,000t
- Mussels 3,000t
- Oysters 2 mil pieces-only for domestic market

(Source: Ministry of Agriculture, Fisheries and Rural Development 2008)

3.2. SPAWING, SPECIES, SIZE, AGE, RESOURCES

All stocks of fish in the Adriatic Sea are depending on the sea conditions: temperature, salinity, etc. Important factor is fish migration during the whole year all over the Adriatic Sea. In whole Adriatic Sea the most significant **spawning** area is Jabučna kotlina. Some 2/3 of that area is in territorial water of Croatia and 1/3 in international waters. In this area there are some 80 different species and half of them are economically important for Croatia.
Index of **species** in biomass are showing that in Croatian part of Adriatic Sea there is 2-3 times more fish than in Italian part. All fisheries are based on mixed catch and because of that applying of quota system in Adriatic Sea are considered as a challenge.
Some changes have happened in that area during the years. Changes were created in **size** of different species - sometimes even up to 20cm like in case of specie "kovač". These changes are expected results due to continue changing of hydrographic conditions and more exploitation. The catch has become smaller and because of that there is less seed and spawning. In the end the ongoing fishery activities are not sustainable in long term perspective. Most of the larger species are presently available only in the part of the Sea that belongs to Croatia- like sea cat. Large intensity of exploitation over many years and too warm sea has caused a drastic reduction in biomass of shrimp.
Standard **age** of fish in Croatian waters is some 3-4y and that is considered as a main reason why there is no possibility from Croatian responsible bodies to issue a recommendation for resource management in longer time periods.
The shared ownership of the biomass with neighboring countries makes it not easy to **manage** the **resources**. There are also some common measures that are restricting catch capacity.

3.3. FISH PROCESSING INDUSTRY

The fish processing industry in Croatia with its 130 years old tradition is one of the prime industries in coastal area of Croatia. Today we have more than 40 companies in Croatia engaged in production of fish products with 20000 t of fish processed annually. Most of them are located in Zadar region.

Important products of fish processing industry are :

- Canned fish (small oil fish, large pelagic fish)
- Dried, salted, smoked and marinated fish
- Fish filets
- Frozen fish
- crustaceans, shellfish, mollusks

New products in this industry are:

- Smoked and marinated bass fillets
- Smoked eel
- Marinated shrimp tails(becoming important in the processing industry)
- Pate and salads prepared from a wide number of species

At present, some of the companies in this branch are :

- ADRIA (Zadar)- 350 workers, 50 fish products
- MARDEŠIĆ (Zadar) –experiencing difficulty related to working force (not so many people want to come to work at the island)
- MARITUNA (Zadar) – have their own fleet and fish farms
- SARDINA (island Brač)
- OSTREA (Benkovac, Stankovci off shore company)– large processor of pelagic fish (export 98%), daily produces 100t of salted anchovies; products: salted anchovies in barrels 100-130kg and salted file in oil(plan for 5,000t/y),fish goes as half product to Albania for further processing, etc.

In 1996 Croatian producers were first in the world who started farming of blue fin tuna in place Kali (Zadar region - island Pašman)

(Source : CCE 2007)

Conclusion:
There is a need for a dedicated and well organized **fishing ports** in each district along the coat with significant yearly catch/landed volumes. Such ports should primarily provide landing capacity and quality treatment for the catch. In addition such ports should provide all relevant services needed by fishing vessels.
The existing **discharging places** in Croatia are not adopted for professional handling of fresh quality fish. The fish is normally delivered directly from vessels with ice and transported to fresh fish markets or to processing industry elsewhere.
There are positive discussions among fishermen to establish **first-hand trading of fish** organized as an auction system where fishermen`s organizations are in charge of the auction7trading. In this respect an important issue is to define quality measures for fish and settle a pricing mechanism where higher quality pays off. Physical location is irrelevant as this will take place on internet/telephone. In the long perspective it is likely that such auction systems should be on national level.
Today some 20 000t of fish is **processed** annually. Many of the companies in this field are located in Zadar area. The most modern plant in Europe for salting anchovies is in Stankovci- “Ostrea”. There is a significant downward trend in processing of fish with the exception for canned products.
The value chain is simple one, but so far enough for Croatian needs.

3.4. EXPORT AND IMPORT OF FISH AND FISH PRODUCTS

2007 Export 30,596t / 152.429.180 USD
Import 47.825t /120.613.368 USD
(Source: Ministry of Agriculture, Forestry and Rural development, section for fishery 2007; Operative fishery program)

2008 Export 29,353t
Import 53,359t
(Source: CCE 2008)

Export is dominated by tuna and anchovies. The export of tuna fish accounted for more than 63% of total fresh and frozen fish export in 2008. Export from fish farm industry - tuna goes to Japan and white fish mainly to Spain and Italy. Yearly production of tuna fish is some 5.000t has a value of 80 mill EUR.
(Source: CCE 2008, and Ministry of Agriculture,..)

Until now promotion activity related to fish consuming was insufficient. In EU people are eating about 21kg/y. In Dalmatia people eating about 15kg/y per inhabitant and in inner parts of Croatia some 3-8k/y. If Croatia wants to achieve recommended amount of fish eating and compared to EU then Croatia will experience lack of fish according to existing numbers.
So the idea is to develop fish farming sector in order to increase the existing volume of fish.

Conclusion

In recent years, fishery production has been mainly export-oriented. In terms of quantity, the most important resource is small pelagic fish. In terms of catch value, the first place is held by trawl fishing. Captive fisheries are showing a positive trend, with an increase in total landings of small pelagic species. Sardine is the basic for the processing industry and is also used as a feedstock in tuna farming activities. Anchovies are used as the raw material for the salting industry - also showing significant development. The fish processing industry is currently restructuring and switching offer from the relatively cheap products to new and more expensive products. The development of new products provides an outlook for further production - exceeding the present values.
Croatian trade of fish and fish products is generally characterized by the import of large quantities of low-value species and export of high-value products.

3.5. AQUACULTURE SECTOR IN CROATIA

One of the future important sectors for economic development along the cost of Croatia could be aquaculture. National Strategy of Croatia for aquaculture and fishery sector is from year 2002. The plan in 2002 was to increase annual production of white fish in Croatia from 3.000t to 10.000t and shellfish from 2.500 to 20.000t up to year 2010. Long term strategic goal of Croatia is to bring Croatia among leading Mediterranean countries in fish and shellfish production and in competitiveness of products. Total aquaculture sector in Croatia includes 138 shell farmers, 32 white fish farmers and 8 tuna farmers.

The yearly production in aquaculture was:

- Shells some 4.000t
- White fish some 4.000t
- Tuna fish some 6.000t

a) Fish farming

In 2008 fish farming in Croatia was 9000t. That number is divided between tuna, sea bass and gilt head. Total tuna farming is aprox. 5000t/y with an export value of 100mill USD.
Companies in this branch are located all over Croatian coast. The largest number of farm for white fish and tuna fish are in Zadar region; company "Cenmar" and company "Kali tuna". In Zadar county there are 11 farms for white fish.
In legalization, related to fish farming it`s allowed to farm 100 t/y. Everything above it is with obligation for a environmental protection study - the cost of that study can be up to 1 mill KN.

b) Shell farming

Largest shell farms in Croatia are located in Dubrovnik region (102), and then Šibenik region (18). It s estimated that in Dubrovnik region some 100 companies are waiting permits for shell farming and in Šibenik region some 20 of them. Concessions are issued on period from 5 to 20 years. So far concessions were typically for 50t/y. Now concessions for 400t/y are way where ambition is to professionalize the sector. Over that number there is obligation for an environmental protection study.
The shell farms are usually operational as family crafts and their way of work is not industrialized (there is not a professional system for quality testing, processing and marketing). Producers are selling their products from "hand to hand" (directly to restaurants, or on markets, etc.). There are no official data about exact quantity on the domestic market because producers are obliged to keep data about export only.
In 2008 quantity of blue shell and oyster together in Croatia was some 3000t/y. Some indication shows that this number can be increased by some 7000t/y due to shells sold on the "grey market ".
Export of shells is not allowed to EU countries because of missing standards in monitoring of shell fish. This is expected to be changed in the beginning of 2010. Present way of monitoring is expensive one - some 3mill KN for amount of 3000t/y (6000Kn for a sample).
There is a difficulty related to quantity of shell fish – shells are not full enough during whole year except shells from Šibenik region (normal quantity of shell meat should be some 35% of the whole volume of the shell but in Croatia in summer it s only 25%, only in Šibenik area - some 50%).

Related to all above shells are not competitive on the abroad market.
At present there are no sustainable marketing efforts from Croatian shell producers. This sector has no developed channels for processing and selling the products and that`s the challenge for all participants involved in this business.

Some modifications can take place in the future in order to improve competitiveness of this branch, like:

- Adaption of production to the market needs (domestic needs, tourism needs, export)
- Market development
- Adding higher value to the existing aquaculture products
- Farming domestic species
- Diversification of production by including new species
- Improving managing and reducing production costs
- Alliance with standard of environmental protection, etc.

The numbers per county in aquaculture are:

Dubrovačko-neretvanska county

- Shell farms, 102 with production of some 3.000t
- White fish farms, 5 with production of some 400t

Splitsko-dalmatinska county

- Shell farms, 2 with production of some 50t
- White fish farms, 11 with production of some 900t
- Tuna farms, 4 with production of some 2.500t

Šibensko-kninska county

- Shell farms, 18 with production of some 500t
- White fish farms, 2 with production of some 100t

Zadarska county

- Shell farms, 5 with production of some 100t
- White fish farms , 11 with production of some 2.000t
- Tuna farms, 4 with production of some 3.500t

Primorsko-goranska county

- White fish farms 1, with production of some 100t

Istarska county

- Shell farms, 11 with production of some 500t
- White fish farms 2, with production of some 300t

(source: Antun Pavlović 2008, Ceh za ribarstvo I marikulturu HOK-e; Aktualni trenutak u marikulturi, ribarske luke, iskrcajna mjesta za ribu)

- 40% of all catch on national level

  (source: CCE Zadar)
- Fish farms: 4,000t tuna-capacity of tuna farms is even more cca 5,000t(everything from there goes to fish processing companies Jadrantuna and Kalituna),
- Fish farms: 2,200t/y white fish(1,000t CENMAR-money from tobacco industry, 600-1,000t DALMAR–italian partners, and others; but increasing)

(Source: Study of feasibility of construction and adaptation of the fishing infrastructure in accordance with the EU regulations, 2006)

4. FISHING FLEET

At present in Croatia we have some 3500 authorized permits for commercial fisheries (professional fishermen). Total fleet in Croatia in 2008 was some 3500 vessels; that include trawls, purse seines, etc. and some 60 different types of fishing gear.

(Source: Ministry of Agriculture, Fisheries and Rural Development 2008)

Precondition to make this sector sustainable is modernization and reconstruction of fishing fleet. There is a need for vessels that are adopted to available resources and to quality requirements related to handling of the catch. Large number of fishing vessels is not proportional with their capacity which is relatively small mainly because of outdated technology. The present fishing vessels have no modern onboard handling of fish in order to maintain quality and freshness of fish. Government has made some steps related to modernization of fishing fleet and further initiatives are expected related to the new law. Former regulations in order to reduce catch by limiting the engine power of fishing vessels to 200 Hp seem outdated.

Financing

In 2005 the Government accepted a model of financing for the reconstruction and modernization of the fishing fleet. The program includes plan for about 50 ships (Ministry has financed planning documentation for 2 types of vessels: 25m and 34 m long purse seiners, one for pelagic coastal fishery and the other for open sea fishery)

Funding model consists of:

- 10% own funds
- 30% state aid from 3 Ministries
- 60% loans

Terms of financing:

- Repayment period 15y
- Paying back from year 3
- The interest rate up to 2% per annum

(Source: Ministry of Sea, Tourism, Transport and Development, Public Hearing 01.03.2006.)

Comment

A vessel of 25m length has total catch of some 550t/y. Fishermen are allowed to have 800 m of fishing gear. Type of vessel of 25m is most likely economical feasible according to this data. The 34m long vessel can be better for purse seines and for open sea territory.
The available fish stocks and historical catch volumes are out of proportion compared to the planned investments in new vessels. Other option can be investment in a variety of vessels, both with respect to size and fishing gear. These alternatives should be related to the fish resources, employment and sustainability of the sector. Otherwise, at the end the resources will be in danger.

Conclusion

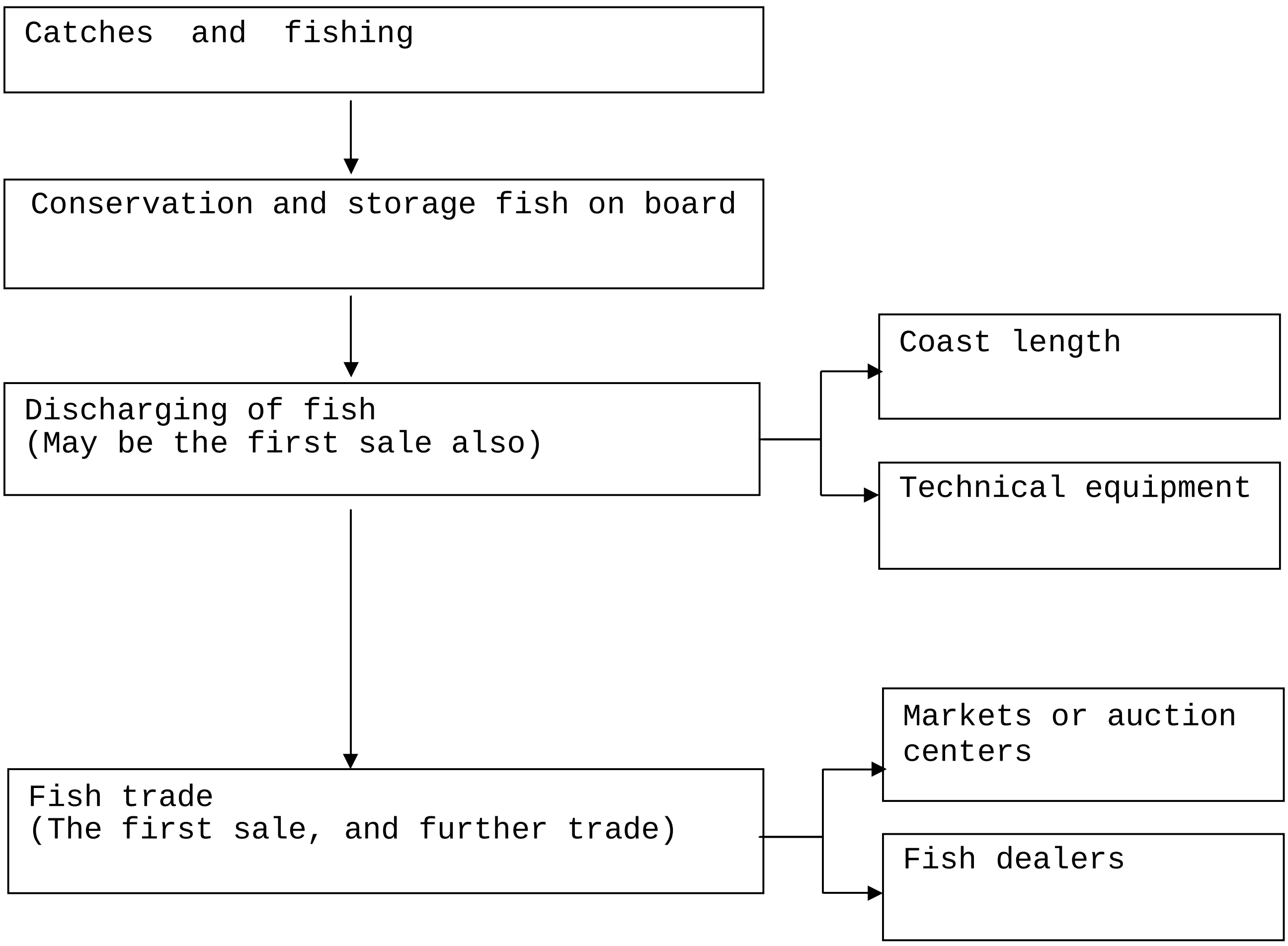
The Croatian fishing fleet is similar to other Mediterranean fishing fleets in structure and size.
Fishing is mainly undertaken by a relatively large number of small fishing vessels in a relatively narrow coastal area. The average vessel age exceeds 25y.
Demerzal (bottom) trawls and pelagic purse seines make up most of the total number of used gear and the catch volumes. To make the adjustments in accordance with EU legislation, the Republic of Croatia is obliged to create a national strategic plan for structuring and development of the whole fishery sector. Such plan was expected during the first half of 2009, but is not available yet. That Plan should contain a description of all aspects of fisheries, and set the priorities, goals, necessary funds and deadlines for its implementation.
Fishery sector in Croatia has a small share in GDP (GDP from fishing is 0.23% of total GDP in the 2004), and have been decreasing over the past few years, although there is a visible growth of the total value of the sector.
(Source: Operational Program for Fisheries, Zagreb 2008, the Ministry of Agriculture, Fisheries and Rural Development - Fisheries Department)
Fisheries note a relatively large number of employees, which is important for all areas where the possibility of permanent employment during the year is limited.
(Yearly fishermen are operative not more than 35 weeks from total 52 weeks regarding weather and other factors. A purse seiner vessel in Croatia makes income of 3mil KN/y with catch of some 550t-580t).

5. SWOT ANALYSIS

Strength	Weakness
• Thousand years of tradition / main activity at the Croatian coast and islands • Favorable natural resources and geographical location for development of fishery and aquaculture • Rapidly renewable and considerable source of pelagic fish • Tradition of fish processing industry • Possibility of increasing aquaculture production • Croatia is close to significant Mediterranean markets	• Old fishing fleet with outdated technology • Unorganized fish trade • Insufficient investments in modernization of production • Inefficient management of whole value chain • Non developed recognizable Croatian brand
• Strengthening of existing fishermen associations • Better cooperation and communication between all parties involved in sector development • Networking in the cluster • Improving logistics and infrastructure in ports • Developing of auction system • Promotion of Croatian fish products • More products with added value • Increasing competitiveness of production • Existence of unused capacity for aquaculture • Fishery at the open sea territory	• Existence of "grey" market • Various difficulties in fish trade (economic and legal conditions, etc.) • Slow administration (difficult to implement new forms of logistic and sales channels) • Lack of knowledge transfer from other countries • Uncontrolled use of marine resources
Opportunities	**Treats**

6. FLOW DIAGRAM FROM THE FISH CATCH TO THE FIRST SALE

PRESENT VALUE CHAIN



(Source: Study of feasibility of construction and adaptation of the fishing infrastructure in accordance with the EU regulations, in November 2006)

This is the existing value chain in Croatia. In the future this value chain can be developed by including MONITORING, REGULATING AND MANEGEMENT OF BIOMASS. It can be extended on some areas like FRESH TO MARKET, PROCESSING AND NEW MODELS OF MARKET.

7. STRATEGIC GUIDELINES OF CROATIAN FISHERY

General guidelines from Operative fishery program 2008 (Ministry of Agriculture, Fishery and Rural development) are ecological, social and economic sustainability of the whole activity. Guidelines are based on available scientific background and knowledge and constant contact with the fishermen, fish farmers, manufacturers and scientists.

Strategic guidelines of Croatian fishery are:

- Adjustment of fishing and fish farming to responsible and sustainable management in accordance with the protection of nature
- Adjustment of fish farming production to market demands
- Promoting environmental criteria of fish farming and management of water resource for the purpose of their promotion as an attractive tourist product
- Modernizing of fish processing industry
- Encouraging the use of appropriate and selective fishing gear
- Encouraging building of coast infrastructure and logistic for fishery
- Promoting the interests of the fishermen's association

(Source: Operative fishery program 2008; Ministry of Agriculture, Fishery and Rural development-Fishery section)

Main goals of above mentioned strategic guidelines are **:**

- To achieve sustainable fishery; sustainable management of fish and biomass and fishing gear in order of selectivity-improved distribution chain
- To improve fishing fleet and monitoring of fishing vessels in order to improve work conditions, safety, navigation, preserving fish on board, basic hygienic conditions and to improve the quality of fishing by applying new technologies, which would increase the competitiveness of Croatian fishermen
- Modernization of the existing ports and discharging places with all related infrastructure
- To improve organization of fish market/trade
- Modernization and development of existing aquaculture
- Modernization fish processing industry; to develop more value-added for the market
- To improve promotion of Croatian products in this sector in order to create recognizable brand
- Make some improvements on data gathering system regarding catch, cause now all information in this study are from different sources and as such very different.

8. CURRENT ACTIVITIES FOR CONSTRUCTION OR READAPTION OF COASTAL INFRASTRUCTURE FOR FISHING

Šibensko-kninska County

- According to landscape plans of the County, fishing port was planed at the area of St. Peter (but the project documentation has not been launched so far)
- It s also defined coastal infrastructure for aquaculture through selection of existing capacity at Martinska – intention is to adapt it for distribution and purification center for shells
- Gat in Tribunj is currently under concession of fishermen but does not have permanent status.

(Source: Study of feasibility of construction and adaptation of the fishing infrastructure in accordance with the EU regulations, in November 2006)

Project Tribunj – Wholesale

Important project for this area is a new wholesale - fish market in Tribunj – managed by fisherman association Adria Tribun. This project is partly financed from EU funds and partly from Croatian government. The beginning of the construction is expected in 2010 and that includes:
- implementing fish market in Tribunj-the first in this part of the Adriatic with all related infrastructure. The building will include all supported offices for the cooperative management of fisheries, veterinary office, harbor master office, etc.
Catch volume of fishermen using this port now is over 5,000 t/y and that is more volume than in any other port in Croatia. Out of that number 2.300t is white fish with aprox. turnover of 62.000.000 KN, while the pelagic fish is some 2.700 t with turnover of some 10.800.000 kn. Total value of fish discharged in Tribunj is 72.800.000 kn.
Total number of fishing vessels that are using this port is 65. Out of that number there are some 30 vessels from Tribunj and other are from different counties but they are constantly using this port for discharging.
Currently the fishing association Adria Tribunj in partnership with the municipality of Tribunj, City of Sibenik, Government and other partners is coming to the end of the first phase project of the wholesale market in the sense that they are waiting for funds from the IPA funds (EU) in order to begin construction. All current partners formed a joint company and other partners will be included depending on their investments and in the same way, they will get certain rights and obligations.
Present project organization is experiencing lack of knowledge in management of such type of organization and knowledge transfer is possibility for good cooperation with other countries.

(From Fisherman's Cooperative Adria – Tribunj)

Splitsko-dalmatinska County

- It s expected for port Vranjic to be a future fishing port

(Source: Study of feasibility of construction and adaptation of the fishing infrastructure in accordance with the EU regulations, November 2006)

Zadarska County

- Current project is to extend fishing port Velika Lamjana in order to provide 210m coast for discharging of fish
- according to building plan of the Zadarska County, port Gaženica will be extended with one extra part for the fishing port whit 300m of coastline and 20000m2 (to set additional infrastructure related to the handling of fish)

Related to this project administrative and technical activity are in progress.
- Building plan has defined zones for aquaculture in the areas where is theoretical possibility for the construction of coastal infrastructure necessary for conducting business as such

(Source: Study of feasibility of construction and adaptation of the fishing infrastructure in accordance with the EU regulations, November 2006)

Project in Tkon- new fishing and nautical port
Project in Biograd – discharging place

These two projects are interrelated in the sense that the current options are: on the island of Pašman, place Tkon, plan is to build fishing and nautical port with associated services and other contents. The same project is scheduled to build in Biograd discharging place and organize purchase of fish. Biograd is primarily a tourist town with orientation towards tourism and fishing vessels which are currently in the center of the city are presenting difficult for tourism development. Fishermen are supporting the idea of future fishing port in Tkon because it represents a solution to their problem – where to put vessels when they are not operational. On the other hand fishermen are considered Biograd to be place for discharging of fish related to faster transfer and further distribution. Openness from both sides according to the project is positive.

9. RECOMMENDATIONS

Croatia is in process of aligning the whole fishery sector to EU standards. During this process many different opportunities and possibilities are available for Croatia in order to improve the efficiency of the whole sector like:

- The available **fish resources** and the capacity of sector indicate a need for national policy and organization of professional participants at a national level. The outcome could then be:
    - National regime for monitoring and management of fish resources in order to maximize the long term sustainable yearly catch of the fish.
    - National regime for better data gathering
    - National regime for better management of common resources between neighboring countries
    - National programs for improving the fishery sector and adapting to market standards:
        - Renewal programs and modernization of fishing vessels and types of fishing gear
        - Quality requirements for handling of fish – both onboard vessels and in value chain towards market
        - Development of a limited number of fishing ports with well developed landing facilities, services and infrastructure
    - Professionalizing the first hand trading of fish and development of marketing/distribution channels for fish(get away from the “grey market”)
- The **fishermen** would obtain an improved economic framework for their operation by organizing themselves in a joint association both at national- and county-level.
  New investments are likely to be profitable when oriented towards:
    - New fishing-vessels with improved onboard quality-handling of catch in order to expand operational radius to greater portion of the national territory and maintain improved quality of caught fish
    - First hand wholesale and first line on-land processing of fish should take place in fishing ports with high quality logistics and infrastructure requirements.
- The **shell-farming and fish farming** industry consists of many small farms. It should be recommended to build product-brands and jointly develop processing, monitoring/management and logistics functions in order to develop the whole aquaculture sector
- The **value chain** towards markets for both fish and shell products can be improved in order to supply better quality for a higher price with continuous availability :
    - Branding of Croatian high quality fish- and shell products requires joint effort in the markets from the fishermen, processing industry, and sales organizations
    - Improved logistics systems towards the market in order to maintain quality for fast moving of fresh products.
    - Croatia is close to a substantial market compared to the catch volumes, and can have an advantage by focusing on fresh basic products (can be even alive products).

CroNoMar's mission is to participate in commercial development of new modern, innovative and sustainable products, processes, and services in marine sectors in Croatia. CroNoMar has strong links and opportunity to do networking between the fishery sectors in Norway and Croatia. The total fishery sector in Norway is some 50-times bigger in volumes and value compared to Croatia.
CroNoMar is prepared to be involved:

- In development and implementation of quality handling and preservation systems for fish onboard fishing vessels.
- In professionalizing the processing and to promote the value chain from first-hand sales to consumer-markets for fresh fish and shell products
- In development and adaption of fishing-vessels including handling of fishing gear

A consultancy company could be established to support and assist in such development. The potential for establishing technology transfer between the Croatian and Norwegian fishery sector and institutions is absolutely relevant.

- In the shell farming sector CroNoMar can be relevant partner in development of a new generation of plant for farming and first hand processing of shell products. CroNoMar's perspective for such involvement should be as partner in development of pilot-plants where both farming, processing and marketing/sale should move one step further in a professional direction compared to present standard in the sector.

In addition CroNoMar is positive to actively support the establishment of knowledge and experience networks between Norwegian and Croatian authorities, associations and R&D institutions in order to assist the development of policy, legal framework and public infrastructure for the fishery and marine farming sectors in Croatia. In this perspective relevant cooperating partners from Norwegian side can be: the Norwegian Fishermen's Association, The Fishery Directorate of Norway, The Coastal and Port Directorate of Norway, and Fishery, Aquaculture and Marine Biology related educational and R&D institutions.
Relevant topics for such cooperation can be:

- Monitoring, management and control of marine biomass in order to regulate the fishery sector for long-term sustainable development
- Development of policies for development and operation of the fishing fleet
- Development of policies for first-hand sales and branding/marketing of Croatian fresh fish
- Development of fishing ports
- Organizing the education of fishermen for a sustainable and profitable development of the operational part of the sector.

CroNoMar will keep track of the future development of the sector with the aim to assist local initiatives that aims at the types of initiatives mentioned above.