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Management and overfishing problems in the High Adriatic sea and the future policy perspectives.

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Paper prepared for presentation at the 2nd AIEAA Conference

6-7 June, 2013
Parma, Italy

The paper focuses on some aspects concerning the organization and management of fisheries in the Adriatic sea, in particular in the Northern and Central part, identified as Geographical Sub-Area 17 (GSA 17 – High Adriatic sea). This area includes Italy, Slovenia and Croatia and it has a high environmental importance due to the presence of the lagoon and high eco-biological ecosystems. The Northern-Central Adriatic area is one of the most productive areas of the Mediterranean Sea and one of the major fishing ground in Southern Europe. The good management of the area implies a cross-border collaboration between countries and a common regulation in order to avoid market distortion, stocks overexploitation and unevenly conservation of natural resources. The creation of a Fishing District between the two sides of Adriatic Sea could help to find a common governance of the area and could be a good solution for the implementation of the Common Fishery Policy in future. The Social-Economic Fishing and Aquaculture Observatory of Chioggia (VE) is one of the members of the Technical Group and plays an important role in this cross-border collaboration.

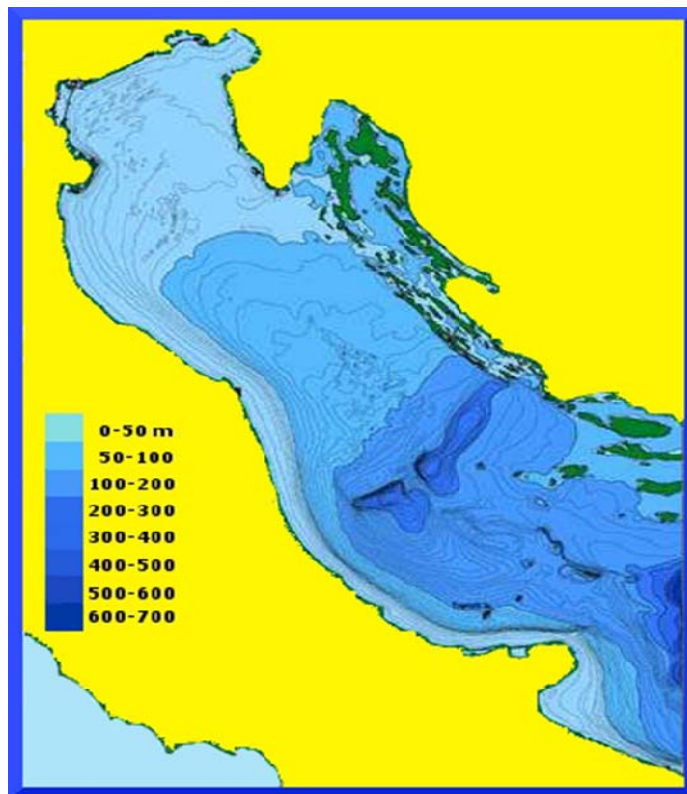
Keywords: fishery, natural resources, governance, district, Common Fisheries Policy.

1. INTRODUCTION

The Social-Economic Fishing and Aquaculture Observatory is located in Chioggia (Venice), in the Northern part of Italy, and born in 2004 thanks to the funds coming from the cross-border project AdriFish, a partnership defined among Slovenia, Croatia and Italy (Administrative Regions: Emilia Romagna, Veneto, Friuli Venezia Giulia). The main aim of the Observatory is monitoring the dynamics of the North Adriatic sea: it collects information and statistics about fishing activities and offers a technical support to the Regional Administration and Fisheries Association. The Observatory collaborates also with research Institutes and Universities. It has a website and publish a periodical concerning the most important aspects of fisheries management in the North Adriatic Sea.

The paper focuses on some aspects concerning the organization and management of fisheries in the Adriatic sea, in particular in the Northern and Central part, identified as Geographical Sub-Area 17 (GSA 17, Figure 1). It is one of the most productive areas in the Mediterranean Basin, interested by a dramatic expansion of marine capture fisheries since early 1970s. To avoid the depletion of the stocks, specific fishing rules were issued from European Union. But the coexistence of European and extra-European countries creates some problem in the respect of common rules and requires a cross-border collaboration. The creation of the Fishing District of North Adriatic could help to find a common sustainable governance of the whole area and avoid the overexploitation of the resource.

Figure 1: The Geographical Sub-Area 17 (Northern and Central Adriatic Sea)



2. SWOT ANALYSIS OF NORTHERN-CENTRAL ADRIATIC AREA

This area plays an important role in the economies of European countries mainly Italy, Slovenia and Croatia. The importance derives not only by fishing activities but also by tourism, in particular in the Balcanic area. A Swot Analysis describes briefly the context of the area, evidencing in particular the differences between Italy and the Balcanic coast.

Strenghts:

- Important environmental resources with high eco-biologic and landscape values
- Good infrastructural system in the Italian High Adriatic regions
- Cultural and linguistic affinity between the Eastern and Western Adriatic Sea, with easy relationships between the local communities
- High socio-economic links between the Italian and Balcanic coast, in terms of development of common initiatives and job opportunities (integration between demand and supply of work)
- High varieties and quality of the fish products
- Touristic opportunities, not completely exploited, linked to the high environmental, historical and cultural heritage of the whole area
- Presence of important Research Centers

Weaknesses:

- Degradation of some marginal areas, not manned by human activities because of the decline of communities traditionally devoted to fishing activities.
- Depletion of fishing resources and biodiversity as a consequence of unsustainable fishing activities and local policies not coordinated at interregional level.
- Scarce infrastructural development in the Balcanic side, comparing to the Italian side
- Unfair competition between the fishing operators due to lack of market transparency and the high market distortions
- Low level of scholastic education in some age classes of Balcanic population, with a consequent lack of specialized workers and an increasing work risk.
- High seasonality of fishing products and difficulties to compete with low quality products coming from overseas market
- Socio-economic decline in some marginal areas
- High seasonality of tourism, intensive in summer and limited or scarce during the winter.
- Scarce promotion and diffusion of results

Opportunities:

- The presence of natural resources with high values represents an important development factor, especially for tourism

- The fishing operators in the whole Adriatic are aware of a need to defend and preserve the fishing resource and to increase the biodiversity
- In the Italian side an important know-how is available, especially in terms of process and product innovation and in terms of market strategies
- Availability of young workers in the Balcanic side, differently from the aged operators in the Italian side
- In the High Adriatic coasts there is an important and competitive touristic activities, thanks to the environmental and socio-cultural values
- The activity of the Research Centers can be improved throughout cross-border collaborations

Threats:

- The overexploitation of natural resources and the irreparable damages to the whole heritage
- The reduction of biodiversity as a consequence of fishing overexploitation due to the bad management of the economic activities (lack of coordination between the Eastern and Western side of Adriatic)
- Lack of cross-border cooperation and coordination, especially as concern the product and process innovation and the market strategies.
- Lack of training and adequate job opportunities for the new generations in the Balcanic countries, in which illegal jobs and criminality could increase
- Irregular development of touristic activities with depletion of territory and local resources
- Lack of links between the research and the productive and environmental activities.

3. DATA ANALYSIS:

The Northern-Central Adriatic Sea has been interested by a dramatic expansion of marine capture fisheries since early 1970s (Fortibuoni et al., 2010). Since the late 1980s marine capture has progressively declined especially for anchovy (*Engraulis encrasicolus*) and pilchards (*Sardina pilchardus*) stock (Azzali et al. 2002, Mannini et al., 2004). In the last forty years catches have increasingly been dominated by juveniles and small-sized species, such as small pelagic and cephalopods (Fortibuoni et al., 2010). The increasing in fishing effort, in fact, has the main consequence in the decreasing of average size of the caught fishes. To avoid a further depletion and facilitate the recovery of marine resource, specific fishing rules were issued from European Union, with the aim to reduce the pressure on fish stocks in different ways: limiting the overall size of the fleet, limiting the number of days at sea, regulating the mesh sizes for nets, etc.. In particular, the small mesh sizes have caused a sort of biological overfishing, slowing down the biomass growth and avoiding a sustainable recruitment. To facilitate the recovery of marine resource, the Italian government has adopted a different management measures i) limiting through licensing system the size of the fleet, ii) limiting the fishing power of the vessels, iii) declaring closed fishing seasons, iv) implementing seasonal trawl spatial and temporal closures (during summer for 30 to 45 days and to 60 days in 2011), v) banning harmful fishing gear, vi) modifying the mesh size, vii) protecting juveniles imposing a minimum size for several target species (AdriaMed, 2005). Moreover, the establishment of marine protected areas and biological conservation zones has enforced the application of sustainable management model also in fishery sector. Actually

there is an unevenly resource exploitation in the two side of Adriatic Sea: on one side European countries (Italy and Slovenia) have to apply the common disposition and rules imposed by the European Union; on the other side extra-European countries (mainly Croatia) have more degree of freedom in the fishery organization and management. This results clearly by the analysis of fish catches in the Adriatic Sea, based on the information collected from 2005 to 2011 by three main sources: Institute for Economic Research in Fishery and Aquaculture (IREPA); Croatian Bureau of Statistic (CROSTAT); Statistical Office of Republic of Slovenia (SLOSTAT). To highlight the different situation of the North-Central Adriatic area, the analysis focused on European countries (in the western side, Italy and Slovenia) and extra-European countries (in the eastern side, mainly Croatia).

The different development of fishing activities has determined a different exploitation of the resource is evidenced in the Table 1, that shows the catches in the Adriatic Sea from 2005 to 2011. Globally, the EU countries have reduced the catches by 27.4%, excepting pilchards (+109.7%) and mullets (+12.3%). In the 2011 the total catches was 80,665 tons. In the extra-EU countries, in the same period, the catches increase by 103.5% and also in this case, the species with the highest rise have been pilchards (+178.7%) and mullets (593.3%).

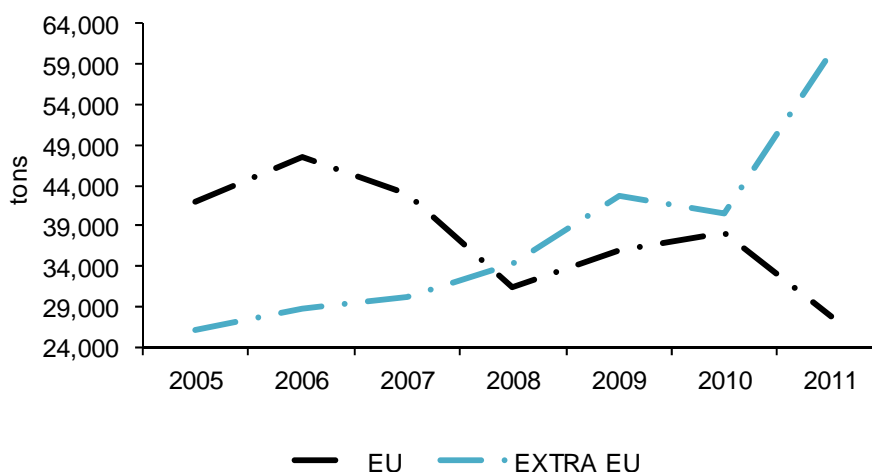
Table 1: Adriatic Sea catches from 2005 to 2011 (tons)

species	EU			EXTRA EU		
	2005	2011	variation 2011/2005	2005	2011	variation 2011/2005
European anchovy	38,271	20,005	-47.7%	9,504	14,382	51.3%
European pilchard	3,690	7,737	109.7%	16,521	46,051	178.7%
Spottail mantis squillid	3,993	3,884	-2.7%	251	206	-17.9%
Mullet	2,195	2,466	12.3%	30	208	593.3%
Common cuttlefish	4,417	2,401	-45.6%	80	105	31.3%
Red mullet	3,728	1,902	-49.0%	911	1,143	25.5%
European hake	3,611	1,474	-59.2%	870	777	-10.7%
Other species	51,217	40,796	-20.3%	6,469	7,622	17.8%
Total	111,122	80,665	-27.4%	34,636	70,494	103.5%

Source: data processed by Social-Economic Observatory of Fisheries based on IREPA onlus, CROSTAT and SLOSTAT.

The most important commercial species of the North Adriatic Sea are anchovies (*Engraulis encrasicolus*) and pilchards (*Sardina pilchardus*). In the whole area, anchovy catches felt down from 32.8% of the total in 2005 to 23.6% in 2011. Conversely, pilchard catches grown from 13.9% of the total in 2005 to 36.9% in 2011. The unbalanced situation between EU and extra-EU countries is defined in the Figure 2 that shows the trend of anchovy and pilchard catches during the considered period. In the European countries the catches decreased during the time while Croatian catches rose up in a considerable way from 2005 to 2011.

Figure 2 – Catches of the *Engraulis encrasicolus* (anchovy) and *Sardina pilchardus* (pilchard) in Adriatic Sea (2005-2011)



Source: data processed by Social-Economic Observatory of Fisheries based on IREPA onlus, CROSTAT and SLOSTAT.

As concern the fleet, in the European side of Adriatic sea the number of boats in 2011 has been equal to 3,562 units (-9.1% comparing to 2005) while in the extra-European side the number has been 4,135 units (+12% comparing to 2005). Also the Gross Tonnage is, on average, different in the two areas: European countries have an higher value than extra-European countries, also if it is decreased by 12.6%. In terms of Engine Power (kW), the table shows that, on average, the European countries have a higher value, decreasing in the considered period (-7.6% against the increase in the extra-European countries). Generally speaking the fleet of European countries has been resized in the considered period, in terms of number, volume and power while in the extra-European countries the fleet seems to be reinforced by the small-size component.

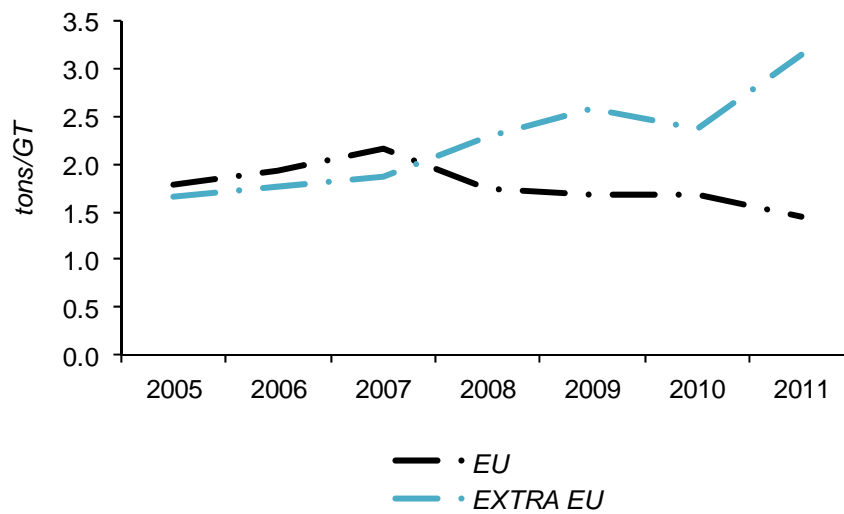
Table 2: Parameters fleet in European and Extra-European countries

	EU			EXTRA EU		
	2005	2011	variation 2011/2005	2005	2011	variation 2011/2005
Boats (number)	3,920	3,562	-9.1%	3,692	4,135	12.0%
Gross Tonnage average	18.6	16.2	-12.6%	11.3	10.9	-3.4%
Engine Power average (kW)	101.7	94.0	-7.6%	66.6	79.1	18.7%

Source: data processed by Social-Economic Observatory of Fisheries based on IREPA onlus, CROSTAT and SLOSTAT.

One important parameter that underlines the level of fishing effort is the ratio between the amount of fish captured and the gross tonnage of the fleet. The figure 3 shows that the European countries have an index more or less constant in the considered period, with a slow increase from 2005 to 2007 and a slow decrease from 2007 and 2011. The trend in the extra-European countries is opposite: from 2005 to 2011 the index is increased in a considerably way.

Figure 3: Annual fishing effort in the Adriatic Sea



Source: data processed by Social-Economic Observatory of Fisheries based on IREPA onlus, CROSTAT and SLOSTAT.

4. THE FISHING DISTRICT OF NORTH ADRIATIC:

The proximity of Italy with other extra-European countries causes some legislative problems and creates unfair and unequal competition in the fishing exploitation. At a local level, one interesting concerted action is the new Fishing District (FD) of North Adriatic sea, born following two decrees (DM of 23 February 2010 and DM of 27 February 2012). The FD operates between the fishing operators (fishermen Associations, vessels owners, processing firms, etc) and the European Union. It has been created following the European disposition that provide for the possibility to have homogeneous areas for the fishing activities, where to apply the same governance rules. The most important governance instrument is the Local Management Plan where the Fishing District activities are planned. In a global perspective, a fast entry of Croatia and Slovenia in the Fishing District of North Adriatic sea is expected. The countries are working together to define a common agreement and common rules applicable in the whole area (Croatia is going to become a Member State in 2013). The cross-border collaboration will be very important in future, assuming an important role in the regional policies. The Local Management Plan can help to solve also some socio-economical problem due to the so-called “economic or bio-economic overfishing”, due to the negative marginal growth of rent and to the low profitability. It seems that this crisis is determining the conversion of the fishermen activities towards the aquaculture (fish but overall shellfish). Thanks to the increase of importance in the Italian market, aquaculture is becoming an important strategic activity to improve the revenues of fishermen, especially in the small-scale fisheries.

5. FUTURE POLICY PERSPECTIVES

The new reform for the fishery sector will enter into force by 2014. The main objective consist of ensuring the conservation and sustainable use of marine resources but also the development of more competitive structures and the quality of life in areas with active fishing industry. To do this, the European Fisheries Fund (EFF) has operated in all the European Member States, funding assistance to fishermen and fishing vessels owners, reducing the impact of aquaculture, supporting initiatives aimed at

diversifying the economic development in some areas, etc.. Three Commission proposals are under negotiation: the new Common Fishery Policy (CFP) framework, the European Maritime and Fisheries Fund (EMFF) and the Common Market Organization. In the negotiation phase, it will be important to guarantee a high bargaining power of Mediterranean stakeholders in order to make more effective the new reform for the Mediterranean areas, which problems and characteristics are very different from the North Atlantic sea. At a National level, the Italian Ministry of Agriculture, Food and Forestry has adopted the 3-years National Program of fishery and aquaculture 2013-2015. The program emphasizes the importance to promote the cooperation and the implementation of new model of fishery management oriented towards the sustainable exploitation of natural resources. Moreover, it underlines the importance to increase the value of fishing products and the needs to integrate the income of the operators. With this respect, the *Position Paper* of European Commission for Italy emphasizes the need to develop a strategic plan for fisheries and aquaculture, to improve the data collection and to combine economic and environmental aspects. Finally, the first draft of the Partnership Agreement for the next programming period, considers the fishery and aquaculture sector as a thematic objective providing important measure for the sector competitiveness.

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