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A novel and simple approach to define artisanal fisheries in Europe

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ABSTRACT

Although the importance of the social, economic, environmental and traditional importance of artisanal fisheries is widely accepted, there is no single internationally accepted definition for this activity, since its characteristics differ among countries. Notwithstanding, it is also generally accepted that artisanal fisheries comprises a group of characteristics that clearly differ from those of the industrial fishing. In the present paper, an objective, simple and easy to use methodology is presented for the segmentation of fishing fleets by using a group of descriptors currently available in the European Union datasets. The numerical descriptors approach (NDA) is a score-based methodology that was applied to several EU fishing fleets from the Atlantic Area. The results obtained allow a more realistic segmentation of the European fishing fleet into artisanal (both coastal artisanal and small-scale fisheries) and non-artisanal than the current limit of 12 m vessels overall length. The procedure can be, and should be, refined and improved by the addition of new descriptors (e.g. operational range of the vessels and fishing effort, time spent at sea as well as other socio-economic indicators) when the necessary information becomes available for the entire European fishing fleet. The NDA represents a flexible tool that could be used at any geographical scale by adapting the final score and/or the numerical ranges of each descriptor.

1. Introduction

Artisanal fisheries involve about 90% of the world's fishermen [1] and capture about half of the fish destined for human consumption in the world. It is estimated that around 200 million people participate, in some way, in artisanal fisheries throughout the world [2]. In developing countries, these fisheries make an important contribution to food security and help alleviate poverty, as the fish captured provide about 19% of the animal protein consumed in such countries [3]. Artisanal fisheries have been the economic basis of many coastal regions all around the world. However, because of the low income provided by such subsistence activities and the low contribution to the Gross Domestic Product (GDP), it is difficult to estimate the real importance of artisanal fisheries in the global economy, although it is generally accepted that they are hugely important [4–7].

Artisanal fisheries are considered an important topic within the FAO guidelines for responsible fisheries [1]. The final report of the FAO Global Conference on Small-Scale Fisheries claims that "small-scale fisheries have yet to fully realize their potential to significantly contribute to sustainable development and the attaining of the UN Millennium Development Goals (MDGs)" [8]. The importance of support for artisanal fisheries has been defended through several recent international initiatives such as the Statement of the World Forum of Fisher People [9], the A Coruña Statement for the European Union [10] and the concluding document issued at the International Oceans 2012 Conference, entitled "Scale Matters, Quality Counts. Securing sustainability through the Common Fisheries Policy Reform" [11]. However, fishing behavior, the main target species, fish landings, fishing effort and the spatial distribution of artisanal fishing fleets throughout the world are neglected topics in the field of fisheries research, with only a few studies

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carried out at local or regional scales e.g. [12–18]. As a result, there is a dearth of information on artisanal fisheries, which hinders the development of sustainable management strategies [19].

Conflicts arise throughout the world where artisanal and large scale fishing fleets coexist, because they both interact in the physical surroundings, on land and at sea, in their operations and in post-harvest activities [20]. Artisanal fisheries are usually at disadvantage and any attempts to protect or preserve this fishing sector require accurate characterization and exact definition of the term. Indeed, the specific characteristics, diversity and complexity of artisanal fisheries, makes their assessment and management necessarily different from those applied in large-scale fisheries [4,21]. Artisanal fisheries are highly dependent on coastal inshore waters and their reduced mobility makes them extremely dependent on local and regional ecosystem resources [19]. The distinction between artisanal fishing fleets and large industrial fishing fleets is thus crucial for the preservation of coastal ecosystems and also for the maintenance of traditions and cultural roots in areas that are heavily dependent on artisanal fisheries [2,22–27]. Therefore, the term "artisanal fishery" must be clearly defined. However, this has remained a controversial issue for more than 50 years, because vessels and gears that are considered as artisanal in one region or country are considered non-artisanal in other areas and vice versa. For instance, the regional FAO-COPEMED Project [21] found that different criteria are used to define artisanal fisheries in Mediterranean countries and therefore, instead of finding a common definition for artisanal fisheries, they decided to outline the types of gear that should not be considered as artisanal: trawl nets, large seine nets (other than *lampara nets*) for catching small pelagic fish, gear targeting large migratory species (purse seines, long-lines, drift nets, stationary nets, uncovered pound nets, tuna traps [*madragues*], tuna rods, trawl lines), hydraulic dredges for shellfish and "large" long liners (specific to Morocco). In addition, the terms artisanal and small-scale are often used interchangeably, thus increasing confusion about the terminology. The FAO tends to equate "artisanal" with "small-scale", but states that the term "small-scale fisheries" is more frequently used by anglophones and implies the use of small vessels with low levels of technology, whereas the term "artisanal fisheries" is often used in French and Spanish-speaking areas to refer to traditional fishing methods using low levels of technology, but with little reference to size (Ref. http://www.fao.org/fishery/topic/14753/en).

Although the term "artisanal" does not mean exactly the same in undeveloped or developing countries as in developed countries such as European Union [EU] countries, part of the EU fishing fleet still fits this concept, but with the added problem that the distinction between artisanal and non-artisanal fisheries in Europe is even more difficult to establish. Moreover, within the EU, artisanal fisheries are far most important in southern Europe (e.g. France, Spain, Portugal, Italy and Greece) than in northern Europe. Providing a common definition of artisanal fisheries for European Union is extremely difficult, because of the different interpretations by Member States as to what constitutes an artisanal fishery within their national context which results in a variety of different definitions in different Member States [28]. Even though some common attributes can be used to successfully distinguish artisanal from large-scale fisheries, the distinction does not involve standardised criteria, which impedes the development of a common approach to identify and define artisanal fisheries. Attempts to define and categorize artisanal fisheries have diverted, delayed and perhaps even stalled, thus hampering the development of new approaches to improve their management [29]. The definition of artisanal fisheries is complex and needs a multi-criterion approach [30]. O'Riordan [31] proposed that the following parameters should be taken into account in defining and characterizing artisanal fisheries in the EU: geomorphology, fishing capacity, environmental aspects (selectivity, low discards, low seabed impact, low energy use, etc.), and social aspects (degree of benefit, employment, ownership etc.). This proposal goes far beyond the current legal definition accepted by the European Commission, which is based exclusively on the overall length of vessels (< 12 m) and with trawlers fully excluded. On the basis of this criterion, it can be concluded that more than 83% (70,084 vessels) of the total EU fleet is considered artisanal [28]. The sustainability of artisanal fleets is a widespread policy objective in many EU Member States, and the recognition of the social and cultural role of artisanal fisheries is explicitly included in the European Commission's Green Paper on the Reform of the Common Fisheries Policy (CFP). Furthermore, special treatment for artisanal fisheries, by exempting them from particular management requirements and/or safeguards under any transferable quotas system, is now under discussion. It is therefore of uttermost importance to develop a method of distinguishing the artisanal and non-artisanal fisheries that comprise the EU fishing fleet. The Committee of Fisheries of the European Parliament [32] recently proposed the introduction of the definition of "small-scale fishing" in the Reform of the Common Fisheries Policy, based on the "Joao Ferreira report" [33], stating that "The definition of small-scale fishing needs to be widened to take account of a range of criteria in addition to boat size, including, inter alia, the prevailing weather conditions, the impact of fishing techniques on the marine ecosystem, the time spent at sea and the characteristics of the economic unit exploiting the resource". This clearly indicates that a series of indicators should be used to better identify artisanal vessels for division of the EU fishing fleet. In the present paper, a simple novel method, the numerical descriptors approach (NDA), is presented which can be used to distinguish artisanal from non-artisanal fisheries. The NDA was applied to the fishing fleets of several NUTS 2 regions of France, Spain and Portugal and the discrimination of the fisheries into artisanal and non-artisanal was based on a scoring system of seven numerical descriptors.

2. Material and methods

2.1. Scoring system for categorization of the fleet.

The list of technical, biological and economic descriptors that could be used to categorize marine fishing fleets is very long. A large and diverse number of descriptors have been used and/or proposed for defining artisanal fisheries (Table 1), which in practical terms makes it almost impossible to agree on a global definition.

However, the list of proposed descriptors can be grouped into two broad operational categories: (1) structural descriptors (e.g. overall vessel length, gross tonnage, gears, engine power, etc), and

Table 1
List of descriptors used in the literature for the definition of small-scale/artisanal fishing.

References	Structural descriptors				Functional descriptors					
	VL	GT	EP	YC	SP	GE	SE	FT	WL	EI
[12,14,17,43]	X	X	X		X	X				
[19]	X	X	X	X	X	X	X	X	X	X
[26]	X						X		X	
[28]	X									
[29]	X					X	X			
[33]*	X						X	X		X
[50]	X	X	X	X	X					
[51]	X				X			X		
[52,53]							X			

VL: Vessel length, GT: Gross tonnage; EP: Engine power; YC: Year of construction; SP: Species targetted; GE: Gears.
SE: Socio-economic descriptors; FT: Fishing trips; WL: Weight landed; EI: Ecosystem impact.

* Proposal to the European Parliament for the reform of the European Fisheries Common Policy (FCP).