

## Defining global artisanal fisheries

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### ABSTRACT

While small-scale and artisanal fisheries are undeniably important globally, there is no global consensus on how to define the sectors, hindering comparative studies and international agreements. We focused on the usage of the words in both the scientific literature and legal documents and show that the confusion stems from a misuse of the terms artisanal, small-scale, coastal and subsistence, and is further propagated by language barriers. Accepting the complexity and subtleties of each term, we developed a simple method based on rhetoric and within a transdisciplinary background, which allows the 'level' of artisanal fisheries between nations to be parameterised and compared.

### 1. Introduction

Small-scale artisanal fisheries are undeniably important and remain central to issues of livelihood, human rights, employment, poverty and malnutrition [1]. The sector represents half the world's fishing effort [2], over one-quarter of the catch in volume [3] and 90% of employment in capture fisheries [4]. Quantitative analysis – of status and trends and global comparisons – have a significant role to play if we want to elevate small-scale artisanal fisheries to their rightful place in the global fisheries discussion. Such efforts, however, have often been stymied to date. While there have been an extensive number of local scale (or at least constrained) studies of small-scale fisheries from a social sciences perspective, there have been far fewer large-scale quantitative analyses. In contrast with industrial fisheries, which are recognised and studied throughout the world, quantitative/comparative scientific studies on small-scale artisanal fisheries have been carried out in a limited number of research hubs, typically from the developed world [5], and only rarely do they attempt to encompass a global range of data, focusing instead on case by case analysis.

A significant hurdle to broader analyses is that confusion exists between the terms used (artisanal, small scale, coastal, inshore, ...), which lack clear definitions in the literature. This confusion is accentuated by the variation in how different terms are used interchangeably in different countries and regions [4,6]. This, in turn, is reflected both

in the variety of national legal frameworks and in the scientific literature, complicating comparative studies and international agreements.

Although some have suggested that a strict global definition for artisanal fisheries would be inappropriate [7], previous authors have argued that a definition is often required to clarify the scope and application of multilateral agreements, and lack of a clear agreed definition can lead to reduced effectiveness, such as seen in international subsidies disciplines [6]. In an attempt to address the complex situation without introducing self-defeating rigidity, efforts have been made to create flexible approaches, such as the Food and Agriculture Organisation (FAO) Voluntary Guidelines [4]. While such flexibility does have its place, particularly in discursive considerations, more quantitative approaches require a categorisation of items in order to treat and study them [8], as a lack of categorisation (definition) leads to a proliferation of uncertainties. This can be clearly seen in fisheries science, where (for example) global estimates of the proportion of artisanal in the catch have been given variously at levels from 25% [9] to 50% [4].

Specialised fisheries literature has focused on the problem of defining artisanal fishing and its consequences, but few have tried to determine its source. We suggest the problems arises from failing to see artisanal fisheries as an enterprise that transcends scientific and legislative concerns, and that a simple exercise of rhetoric and reconnecting with the meaning of each term used can explain much of the confusion.

In order to expose the root of the confusion, two distinct reviews of

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the scientific literature (section 2 below) and national legislations<sup>1</sup> (section 3) have been carried out, to analyse the various methodologies and terminologies used when describing or defining ‘artisanal’ fishing. We further compared the terms used in fishery-related laws to their historical definitions outside of the field, to unveil both similarities and discrepancies. We subsequently used an exercise of semantics based on Aristotle’s rhetoric [10] in order to distance ourselves from specific jargon (section 4). We then demonstrated that it is possible to associate the rhetoric to a quantitative framework based on available data, allowing comparative analysis of international components of the sector.

## 2. Defining artisanal fisheries in the literature

The complexity of the definition of artisanal and small-scale fisheries is as difficult in the scientific literature as anywhere. Published work shows various attitudes towards the sector, which we categorized as: *receptive*, *descriptive* and *decisive*<sup>2</sup>:

- **Receptive** (or **acceptive**) is the acknowledgement that artisanal fisheries exist and are delimited in a way, usually implied by the data or the specific fishery studied. By extension all vessels/people/industry linked to the data are in the sector [11]. The focus is then not on the boundaries of the sector but on correlated aspects, such as describing the life of fishermen, or specific issues linked to the management of the fishery. Various studies have focused on poverty [12], vulnerability [12,13], interdependences and cooperation [14–16], well-being [13], socio-environmental impact [15–17], gender equality [13,18], etc. This approach, arguably the most common in the literature, particularly in social science and governmental/NGO reports,<sup>3</sup> often limits itself to reviewing various examples of artisanal fisheries and their impact. While useful to understand the consequences of the sector, it lacks causal analysis and is reductive in the sense that the lack of clear defining terms rarely allows for expansion of the study. The contextuality of artisanal fisheries implies that what is applicable to one spatially distinct fishery might not be valid for another one [15].
- **Descriptive** goes beyond receptive by not only acknowledging the existence of artisanal fisheries, but also by listing their parameters, in practice defining the sector by its most common features. This method is often used to justify the differences in the impacts between sectors, based on their intrinsic characteristics, and is very common when analysing socioeconomics or environmental characteristics of various fisheries and behavioural or self-determinative attributes of the fishers [19–21]. It is exemplified in the FAO guidelines [4], which encourage flexibility in the definition of the sector while focusing on its sustainability. While allowing for a comparative analysis of various fisheries, it highlights the fact that

artisanal fisheries, with very different components, might have very different impacts, and often restricts itself to geographic areas of similar socio-cultural backgrounds [2].

- **Decisive** describes an attitude whereby a (relatively) clear distinction between what is and is not artisanal is parametrised with quantifiable criteria. A cut-off point, more often than not related to technical parameters such as the length of the boat (e.g. 12 m according to EU law), is used when the study needs to compare or describe various fisheries which would otherwise have little in common. As no agreed global definition of artisanal fisheries exist, studies have used a variety of cutting methods:
  - By exclusion, such as considering artisanal fisheries are all that is not censused or which does not use specific gears [22,23]. This method historically highlighted the focus of studies on the industrial/large-scale sector and the lack of knowledge on the artisanal/small-scale fisheries.
  - By single or multi-field criteria, whether they be technical/vessel-based such as length, gear or engine power [24–26], or economic such as number of employees [27], end-use of the catch, such as consumption and/or non-commercial [28], total catch (value or volume), spatial (depth or location) or fishing effort. The method allows for comparison across countries but presents the disadvantage of aggregating sub-sectors of very different styles together and then comparing the ‘incomparable’, in very general terms, such as via fishing power, economic or social background and environmental impact. Conversely, in the European Union, where a unified definition of 12 m allows for comparability, it has been shown that vessels of 15–16 m length, technically industrial, behave like the small-scale coastal fleet [29].
  - By comparison, often of a social, communitarian, developmental or cultural nature. When comparing across regions with limited data, the method allows for characteristics of the artisanal sector of (often) a country to be inferred from neighbouring/similar countries, such as Norwegian artisanal fisheries considered under 12 m, as per EU law [2]. The focus of these papers is often less on the definition of the sector itself than its implications.

As each of these approaches has its own advantages and drawbacks, each analysis tends to use the method most adapted to the fishery being studied, which often limits its expansion to global studies. It is also common to define a sector by referring to another (perhaps more understood) sector, such as artisanal being small scale and commercial [30].

The complexity of clearly defining a sector is accentuated by the implications of whatever adjective is used to refer to them [31], though recent methods have tried to move beyond single-field criteria. The semantic problem of using particular terms and considering them interchangeable adds another level of complexity, as shown in the global legal framework (section 3).

The use of structural and functional descriptors [32] or vessel, economic and social features [33] allow for a ‘grading’ of the sectors. While such approaches can scale globally, they are extremely data-intensive, and no attempt has yet been made to expand them beyond the regional level. Using too stringent criteria can further complicate studies, as data availability varies, and sometimes forces authors to use different criteria for different regions such as effort vs catch data [34] or using specific technical-based definitions for each countries according to their laws [2].

## 3. Sectorial definitions found in legislation

Besides the consideration of what defines artisanal fisheries, the semantics of the term present a dual problem. Firstly, *fisheries* are not a simple concept. While *fishing* is the relatively simplistic harvesting action carried by the *fisher*, *fishery* is a complex construct, a “bio-tecnico-socio-economic system” [35]. In recent years, the term ‘métier’ has

<sup>1</sup> For each (internationally-recognised) state having access to the sea, as well as three autonomous territories, the main legal documents related to ‘fishing’ were collected through the databases ECOLEX and FAOLEX. The definitions of various sectors were extracted, and classified according to their explicit titles (subsistence, coastal, small scale or artisanal) and their consistency with topographical, usage, extent or technical elements. Effort was made to extract the text in their original language or with official translations of the law in either English, French, Spanish or Arabic. A few countries required the use of translators (e.g. Georgia), while the most literal translation of each sector was used (e.g. ‘pequeña escala’ in Spanish can be translated directly as ‘small-scale’). Specific issues in translation are highlighted in the SI.

<sup>2</sup> Strictly speaking, we can loosely link these terms to the rhetorical functions (description, formal definition and process/semi-formal definition) described in Trimble (1985), *English for Science and Technology: A Discourse Approach*, Cambridge: Cambridge University Press, pp. 180.

<sup>3</sup> We refer the reader to the extensive literature from the global partnership “Too Big to IGNORE” ([toobigtoignore.net](http://toobigtoignore.net)) as an example of both receptive and descriptive approach to small scale fisheries.

been used to try and define clearly some technical aspects of the fishery, although its meaning has evolved over the last few decades,<sup>4</sup> and diverged from the origin of the term,<sup>5</sup> leading to further confusion where it should have brought clarity. Scientific literature can refer to either term depending on the scope of the study, but legislation and policy usually focus on either the fishing or the fisher, and as such the use of the term fishery or *métier* in a national legislative context could be perceived as over-generalizing and confusing. Secondly, as with scientific literature, numerous adjectives can be found in legal documents referring to 'artisanal' fisheries (such as 'small-scale', 'coastal', 'inshore', 'traditional', 'social', 'customary', 'subsistence', ...), but not only does the meaning of each adjective vary with the country, there is no consensus on overlap between the terms.

Progress may be possible if we compare the use of the various concepts and their meanings outside of the field of fisheries:

- *Artisanal* has a specific definition in industry or craft, based on the process and technology involved [36,37], itself linked to the idea of 'primitive' craftsmanship [38]. Therefore, there is a concept of technique, process and technology, with a focus on the process rather than mass production of the produce. We will thus compare the use of the word *artisanal* with the *technical* aspects (gear, boat, engine, ...).
- *Scaling* is generally agreed to be the size of the enterprise, a clear, numerical representation of its *extent*.
- *Coastal* is equally meaningful, a representation of the distance to the shore line, depth and geographic limitations. The word has therefore a clear *topographical* connotation.
- *Subsistence* is, however, relatively tricky. The concept mirrors the idea of survival dependent on the product. Though there is no clear demarcation of what one can do with the products to be considered subsistence (in the case of fisheries, direct consumption, barter, low value sale, ...), the focus is a limit on the *use* and the *goal* of the catch.

We can compare the use of a specific term in legal texts [left column, Fig. 1] with its above-defined meaning [right column, Fig. 1]. Some clear geographical patterns can be seen in the consistency (or lack of) between the use of a term and its meaning. The use of the words 'artisanal' and 'subsistence' to define sectors is consistent with 'technical' and 'usage' aspects. In fact, the few countries for which there is not a clear link between the two columns are the ones referring to the terms in their laws but without any definition. While they could be defined further in policies or

guidelines, at the very least the use of the word indicates the recognition of the existence of such sectors in other countries, if not (necessarily) recognised nationally (e.g. the European Union). Furthermore, few countries limit the technical aspects of fishing or its end use without referring to them as 'artisanal' or 'subsistence'. The 'recreational' sector, referred to by over 80% of the countries considered, presents a further challenge, as it might include some aspect of subsistence.<sup>6</sup>

The term 'coastal' is often clearly understood as topography although many countries impose a distance limit on a sector without naming it 'coastal'. An important exception to the consistency of 'artisanal' and 'coastal' with 'technical' and 'topography' is found in the legal texts of the European Union: while Regulation 508/2014 names the sector as 'coastal', the definition is consistent with 'technical' aspects, therefore understood as 'artisanal' in our framework. The meaning of small-scale fishing, on the other hand, seems very misconstrued. Few countries refer to the extent of the activity, either from an economic, social or environmental perspective. In fact, the vast majority of 'small-scale' sectors is consistent with a technical definition and should be re-labelled 'artisanal'.

A difference between Latin-speaking countries (here limited to Spanish, Portuguese and French) and English speaking countries has been noted [32], with the former assumed to prefer the use of 'artisanal', and the latter 'small scale'. Indeed, over 78% of Latin speaking countries use the name 'artisanal' compared to 50% of the English-speaking world, with similar proportions of legislations consistent with 'technical' aspects (Table 1). The preferred use of 'small-scale' sector in English speaking countries, however, is in fact less common than assumed, with only 29% (and under 16% consistent with 'extent'). The term 'coastal' is only used in less than a fifth of countries in both linguistic regions (10 and 17% respectively), although definitions using 'topographical' elements are found more than twice as often (29 and 34% respectively). 'Subsistence' is widely used as a sector name in both the English-speaking world (over 46% of countries), and Latin-speaking (over 70%), relatively consistent with a 'usage'-based definition (33 and 66% respectively). Interestingly, in the Arab World, relatively low levels of terminology are found, due to a sizeable proportion (38%) of relevant legislation that does not separate fishing into, or by, sectors; nonetheless 'artisanal' is still used in 48% of the Arab-speaking countries.

#### 4. For a rhetorical approach

While the problem of defining 'artisanal fisheries' in scientific literature is one limited by both the aim and usefulness of the term, legal documents might stay away from a clear definition 'on purpose', as the law can be constructed with the intent to interpret a sector name as its '*ordinary meaning*' [39]. This approach, however, can be messy when extended to international agreements,<sup>7</sup> as the difficulty of defining 'artisanal fisheries' has been shown to exist in the use of language itself. Indeed, each country has their own definitions, which have changed over time,<sup>8</sup> and with various association with other terms ('traditional artisan', 'small industry artisan', ...). With fishery being a

<sup>4</sup> Strictly speaking, a '*métier*' referred in the 1970s to both the fishing gear (and target species) and the concept of skills and knowledge required to practice fishing, especially in the context of the seasonality, time frame of the action of fishing [42], linking both technical and social elements to the biology. In recent years, the meaning of the word in fisheries science and law has gone away from the social and focused on the technical, such as the definition used in European law: "a group of fishing operations targeting a similar (assemblage of) species, using similar gear, during the same period of the year and/or within the same area and which are characterised by a similar exploitation pattern" (Decision 2008/949/EC). The word 'fishery', on the other hand, while it can focus on specific species and gears/vessel types (particularly in developed countries), can still be used with an inclusion of economic, social and community components.

<sup>5</sup> Up until the 19th century at least, the word '*métier*' has been used in French almost exclusively to refer to a trade (profession) [43], with the '*petits métiers*' (lit. 'small trade') referring first to unskilled labour (servants, porters, wagoners, ...) [44] later taking on the meaning of traditional, artisanal, and small scale work. In fisheries, '*petits métiers*' became a reference to coastal, manual fishing, as opposed to trawlers [45] and to the '*grand métier*' (lit. 'large trade'), the nickname given to Cod fishing off Newfoundland [46]. '*Petits métiers*' is still used the Mediterranean fleet to refer to vessels who do not possess "a trawling or tuna-sardines licence" [47].

<sup>6</sup> The EU Regulation 2015/523 for instance, refers to "recreational" as being "non-commercial", and seems to exclude subsistence by restricting to sport and entertainment. The Barbados Fisheries Act, on the other hand, clearly includes "personal consumption" in the sport fishing sector.

<sup>7</sup> "A treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose". Vienna Convention of the law of treaties, 1969 (EIF 1980), Sec. 3, Article 31.1.

<sup>8</sup> A striking example can be found in the Chilean Legislation, where the limit between artisanal and industrial sector has increased from 15 Gross Registered Ton (GRT) in the 1980s (Decree 175/1980 regulating fishing activities) to 18 m, 80 cubic metres and 50 GRT since 2007 (Law 20.187 of 2007).

Sector named:

Definition consistent with:

a) Artisanal

e) Technical



b) Small-Scale

f) Extent



c) Coastal

g) Topography



d) Subsistence

h) Use



**Fig. 1.** Countries naming sectors as 'artisanal' (a), 'small-scale' (b), 'coastal' (c), 'subsistence' (d) in their legislative framework, compared with the content of the definition classified as 'technical' (e), 'extent' (f), 'topography' (g), and 'use' (h). Countries in white do not refer to the term, the European Union is considered under the umbrella of Regulations 508/2014 and 2015/523. Only the principal name of the sector (and synonyms if specified) are used (i.e. if a sector **named** 'artisanal' is **described** as 'small-scale' in a law, the name was classified as 'artisanal' and the definition consistent with 'extent'.

**Table 1**

Number of countries using the terms ‘artisanal’, ‘coastal’, ‘small-scale’, ‘subsistence’ in their legislative framework, by main spoken language. Countries might be double counted (esp. Latin languages) due to countries with more than one official language. Although the Latin family consists of many more languages, we kept it to the three main languages spread through colonisation. ‘Unreferred’ indicates that none of the above-mentioned names are found in the legislation (although other names such as ‘traditional’ or ‘customary’ might be found).

Main language	Countries	Unreferred	Name: Artisanal	Defined: Technical	Name: Coastal	Defined: Topography	Name: Subsistence	Defined: Use	Name: Small-scale	Defined: Extent
Arabic	21	8	10	9	3	4	2	3	1	0
English	52	12	26	24	5	15	24	17	15	8
French	21	3	15	15	3	6	12	11	3	3
Spanish	18	0	16	15	4	6	15	15	10	6
Portuguese	9	0	8	9	1	4	8	7	2	1
Latin language (Spanish/Portuguese/French)	47	3	37	37	8	16	33	31	15	10
Total, World	154	22	73	100	42	40	76	56	54	18

transdisciplinary<sup>9</sup> field, and international agreements needing to overcome the language barrier, the confusion resulting from the use (and misuse) of specific terms such as artisan, small scale or subsistence has proliferated. To overcome this issue, we want to address what we think is the root of the problem, i.e. the incorrect use of the terminology.

The use of ‘artisanal’ is complex, because the word itself is multi-layered and a potential confusion is unrecognised. Two specific aspects of the term need to be considered: the understandable but undefined meaning of the term in fisheries, which we aim to address, and the definition outside of the field of fisheries, akin to ‘technical and skilled’ as mentioned above. For the sake of clarity, our use of the word ‘artisanal’ hereafter is limited to the former, while the latter will be referred to as ‘technical’.

Since the question of the definition of ‘artisanal fishing’ is one of rhetoric, we deconstruct the term with the help of the rhetorical tool of Aristotle, the ‘circumstances’, best known as the ‘6Ws questions’ [10]:

The **What** refers to the fishing action itself, and encompasses what is affected by it, here the species. The **Where** has been defined previously as the location and topographical components of the fishing action. The **Why** is understood as the purpose of fishing. Nowadays we consider whether the action of fishing is for enjoyment (recreational), feeding the fisher and/or his family (subsistence), for a product that can be exchanged for other goods (barter) or sold (commercial). The cultural aspect can also be included in this (fishing for religious ceremony for instance). The **How** can be somewhat confusing, as it can refer to either the technical aspect of the action or the (descriptive) manner in which it took place. The technical component is the easiest to grasp, linking in fisheries science to the tools, vessels and gears. The manner is subtler, as it implies a certain judgement on the action. While not as qualitative as the how-tool, it is very relevant to fishing, as it can be linked to the concepts of impact, inclusiveness, equality, and sustainability. The two meanings are linked, as the choice of the tool will have a strong impact on the manner in which the fishing takes place. The ‘how’, both tools and manner, can also be linked to what the literature refers to as ‘scale’, i.e. a construction of methods, extent and impact. The **When** is even more subtle. While Aristotle meant it as the ‘time’ (here, relevant to seasonal or day/night time of fishing), there is an implied link to the past. This could be interpreted as the historical aspect of fishing, often understood as ‘customary’ or ‘traditional’. The final circumstance may be, counter-intuitively, the most difficult, but also most important

aspect of artisanal fishing: The **Who**, or actors. Akin to recent discussions on native inhabitants<sup>10</sup>, the who ties up with the concept of self-determination and recognition by the community, and the right to fish, which are arguably the hardest to quantify.

It is clear that most of these concepts link to each other in their implications for fishing (Table 2). It is, for instance, impossible to untie the species targeted (what) from the gear used to catch them (how), their location (where) and availability (when), the access rights (who) and the end use (why). The answer to these aspects, in fact, defines what the fishery itself is. Like multi-criteria analysis and the concept of artisanal fishing itself, flexibility in the interpretation and rigorous application are necessary (Fig. 2). Our suggested method is similar in principle to the multi-disciplinary multi-criteria one suggested by Gibson and Sumaila [33] for ‘small-scaleness’, but presents the advantages of being simpler and expandable to national fishing fleets as well as specific fisheries. Its implementation is akin to the descriptive methods (see above), in the sense that it does not attempt to set any of the criteria (although it is possible to do so in this framework) but allows for direct comparison between fisheries and/or national fishing sectors. It presents the further advantage of not being limited in its application or scope to a single discipline, but to use concepts and proxies which allow for disciplinary overlap.

In the proof-of-concept example below (Fig. 2), the national fleet of six countries was described using the parameters and proxies described (Table 2) (and classified relative to each other (normalised 0 to 1, with values and chosen extremum outlined in the SI). This is a simple example to demonstrate the method rather than aiming to be comprehensive or exhaustive. Under the proxies employed here, it is clear that Indonesian fisheries are ‘more artisanal’ than the other countries. By contrast, the European countries considered (France, UK and Iceland), although over 80% artisanal (assuming the definition of the European Union applies, even to Iceland), show comparatively lower levels of ‘artisanal-ness’. Specifically, while the targeting parameter (here limited to tuna and herring/anchovies) and gearing is similar to the poorer countries, unsurprisingly other technical (vessel size, motorization), economic (investment, subsidies) and geographic parameters are more advanced. In fact, besides the lack of subsistence fishing in the UK, French and British national fishing sectors look identical relative to other countries. An important message here, however, is that looking at more than one parameter is paramount when comparing various artisanal sectors. If, for instance, only gear was considered, all countries would be at the same levels of ‘artisanal-ness’, while considering all factors it is clear that the sectors are extremely varied. While this simple example no doubt contains many uncertainties, as a proof of concept it

<sup>9</sup> While the concept of a single discipline (‘disciplinary’) is something that is relatively well understood, the distinct concepts of pluri, multi or transdisciplinarity often require clarification. In this study, we understand transdisciplinarity as being a framework that requires systemic inputs from many disciplines of various scopes and levels of coordination (including beyond traditional academic disciplines to include stakeholders and practitioners), in order to rephrase and refine the problem at hand, or as we described earlier: ‘transcending disciplinary concerns’. We refer the reader to the work of Manfred Max-Neef [48] for further details and in-depth discussion on the matter.

<sup>10</sup> Please refer, for instance, to the ongoing debate about the concepts of self-determination, proven link and community-recognition of the Australian Aboriginals, e.g. [http://www.dpac.tas.gov.au/divisions/csr/oaa/eligibility\\_policy](http://www.dpac.tas.gov.au/divisions/csr/oaa/eligibility_policy).



**Table 2**  
Aristotle's circumstances (6Ws) applied to fishing, with example proxies chosen to establish estimates for national fleets in Fig. 2.

6 Ws	Name	parameters	Could also be?	Example of proxy chosen as example in Fig. 2	Source
What Where	Targeting	Species involved.	When	% of catch (in tonnage) from tuna/anchovies*	seararoundus.com***
	Location	Geography	When	% of catch (in tonnage) in EEZ of the country	seararoundus.com***
		Distance to shore		NA (implied in EEZ)	—
		Depth		NA (implied in EEZ)	—
Why How	Purpose	Recreational/Subsistence/Barter/Commercial/Cultural	Who	% of catch (in tonnage) for subsistence	seararoundus.com***
	Means	Vessel characteristics		Average Gross Tonnage per vessel*	EU fleet register <sup>a</sup> , statice.is, produce.gob.pe***
		Gear		% of fleet not trawl	EU fleet register <sup>a</sup> , statice.is, produce.gob.pe***
		Motorization		Average Engine Power (kW) per vessel*	EU fleet register <sup>a</sup> , statice.is, produce.gob.pe***
When		Investment	Who	Subsidies per capita (Thousands US dollar)*	World bank data***
		Societal impact	Who	% of agriculture/fisheries to GDP	fishbase.de***
		Environmental impact	What	% of threatened species in the commercial fisheries*	fishbase.de***
		Extent		% of commercial species to total species	—
Who	Seasonality	Day/night time fishing	What	NA - not relevant at national level	—
		Seasonal species/ground	What	NA - not relevant at national level	—
	Historical	Traditional/Customary	Who/Why	% of indigenous to national population**	iwgia.org***
	Actor	Self determination		% of persons employed in fisheries/agriculture to national population**	—
		Recognition (community)	When	NA - not relevant at national level	—

<sup>a</sup> <http://ec.europa.eu/fisheries/fleet/index.cfm>.

<sup>b</sup> Sumaila et al. (2010). A bottom-up re-estimation of global fisheries subsidies. <https://doi.org/10.1007/s10818-010-9091-8>.

<sup>c</sup> FAO (1999). Number of fishers. FAO Fishing circular FIDI/C929 (Rev.2).

does show that sufficient information exists to allow for comparisons between countries (in turn allowing for the analysis of broader patterns) if an attempt is made to use clearly laid out criteria when classifying fisheries and fleets.

## 5. Conclusion

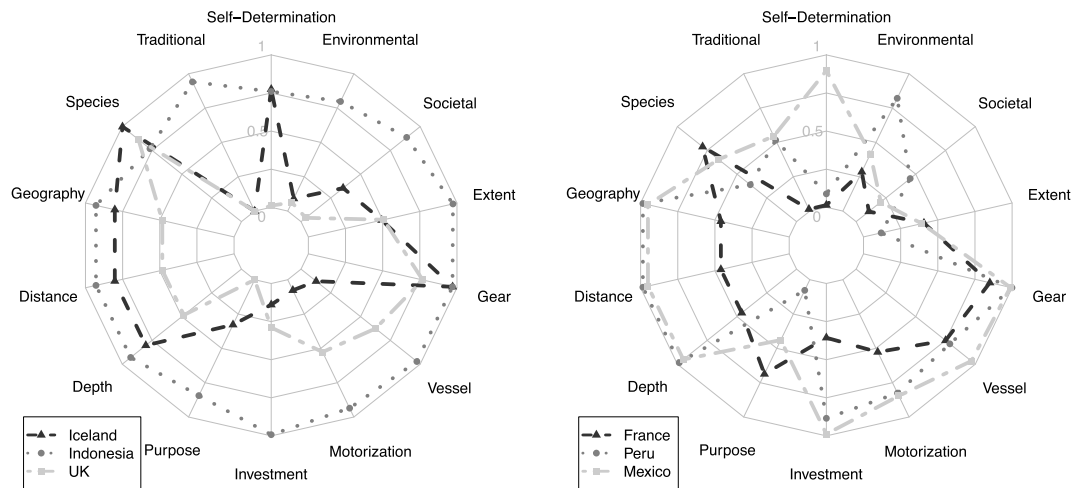
There has been substantial discussion about how to best define artisanal fisheries. Here, we have clarified a few important points. Firstly, no single method is best to define or describe artisanal fisheries, it is case-specific and depends on the specific goals of classification. Some methods such as the theoretical framework we proposed, however, can be applied to many different case studies and allow for direct comparison between various fisheries. By extension, it could be used as the basis for developing policy and legal agreements between regions and countries by recognising the variation in the sector and which parameters to focus on.

Secondly, the language has been and remains extremely important. Not only is the use of sector names over others dependent on the language of the country, but the meaning of each name has been in many cases confused and has lost much of its original intent. Clarification is required if clear international, multi-language agreements are to be reached. The artisanal sector cannot easily be included and protected in legal agreements if not properly defined. From the science and research perspective, the development of consistent, global databases for employment, vessels characteristics and catch are heavily dependent on the definition used for artisanal sectors. Studies cannot be expected to aggregate or compare data that are substantially different in nature. Given the undoubted importance of the sector, not only socially, but economically and ecologically, it is important that a consistent means of referring to it must be found. Multilateral agreements would benefit from universally accepted definitions [6], particularly in zones of conflict due to access rights and sectorial quotas. Given the baggage of existing terms there is a temptation to suggest that using a different word than small-scale, artisanal, etc. might be best. However, there would no doubt be resistance to the introduction of a new word, thus standardising the use of the term 'artisanal' (with its implications and subtleties) might be preferable.

Finally, while (at least) adopting guidelines to refer to the artisanal sector is important, policy makers should keep in mind that these sectors are extremely adaptive, and what is considered industrial today might be seen as artisanal tomorrow, while the artisanal of today could have disappeared. The latter point is particularly well illustrated by the slow but steady disappearance of the unmotorized fishing fleet across the globe. These shifts are also symptomatic of the fact that the duality of artisanal-industrial is not necessarily helpful [40]. Fishing sectors are continuums [41], and trying to clearly delimit them as two separate entities can be futile and painful exercise. The authors recognise that in a topic area as complicated as this one, with so many competing research foci around artisanal fisheries that flexibility is, by far, the best approach. Nevertheless, definitions based on multiple criteria are best when there is a necessity to define sectors in legal or management frameworks, or to allow for comparable studies. It is this ultimate need to create definitions that allow for comparability across scales and for an assessment of the true magnitude of these forms of fishing globally that has driven us into contemplating the issue. Our experience highlights that the complexity of the question of defining artisanal fisheries can be broken down into simpler, more comparable arguments. In turn, we have attempted to answer the need for a flexible -yet simple-framework for tackling such a complicated issue, and to place it against a transdisciplinary background, hopefully opening up discussions for approaches that can be applied globally.

## Conflicts of interest

None declared by the authors.



**Fig. 2.** Graphic representation of indicative parameters used to describe artisanal fisheries, comparing the national level of ‘artisanalness’ in Iceland, Indonesia and the UK (left) and France, Peru and Mexico (right). The parameters of depth, distance and geography use the same proxy. Community recognition and daytime/seasonal fishing were excluded from the parametrisation, as they were assumed to be of low significance at the national level. Sources of the example proxies used for quantification are provided in the supplementary material. All values were normalized (to 1) via comparison with the maximum for the proxy (see SI).

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.marpol.2019.103634>.

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