Food and Agriculture Organization of the United Nations

General Fisheries Commission for the Mediterranean

Matrix for the characterization of fishing activities

Main results and practical applications in support of management in the Mediterranean and Black Sea region

(GFCM Secretariat)

Mediterranean Advisory Council (MEDAC) FG SSF meeting | 14 - 15 October 2025

Small-scale fisheries in the Mediterranean and the Black Sea

FLEET	EMPLOYMENT	REVENUE	CATCH
			
82% of the total regional fleet	**61%** of total onboard employment	**26%** of total revenue from fisheries	**15%** of total regional catch
68 800 Total SSF vessels	**111 500** Total SSF employment	**USD 768 million** Total SSF revenue	**148 000 tonnes** Total SSF catch

However, in the region, there is not a common definition of what characterize a fishing activity as ***small-scale***

What characterizes small-scale fisheries?

In the Mediterranean – and at global level – , the lack of a **single or widely accepted definition of SSF** makes it difficult to compare the sector between countries and to inform homogeneous policy interventions.

How would you define small-scale fisheries?

https://www.menti.com/albyevpm3brq

Join at menti.com | use code 2545 6061

What characterizes small-scale fisheries?

68 responses

What characterizes small-scale fisheries?

In the Mediterranean – and at global level – , the lack of a **single or widely accepted definition of SSF** makes it difficult to compare the sector between countries and to inform homogeneous policy interventions.

EUROPEAN COMMISSION: "*fishing carried out by vessels with an overall length **less than 12 meters** that **do not use towed gear***"

FAO: "*fisheries involving **fishing households** (as opposed to commercial companies), using relatively **small amount of capital and energy**, relatively **small fishing vessels** (if any), making **short fishing trips**, **close to the shore**, mainly for **local consumption***"

ICCAT: "*with **at least 3 out of 5 of the following: a)** LOA less than 12m, **b)** fishing exclusively inside the territorial waters; **c)** fishing trips less than 24 hours; **d)** maximum crew number of four persons; or **e)** selective fishing techniques with a reduced environmental impact.*"

Introduction and rationale for the study

The GFCM recognized the importance to monitor and manage SSF appropriately

Regional Plan of Action for SSF (RPOA-SSF)

"Adopt a **characterization of small-scale fisheries** in the Mediterranean and the Black Sea, reflecting their socio-economic relevance and specifities on the basis of a set of indicative criteria (*vessel size, gear used, duration of fishing trip, non-vessel based fishing activities, etc.*)"

[First point of the RPOA-SSF]

Introduction and rationale for the study

Why characterize small-scale fisheries?

- **Challenge to practically identify SSF** to support policy, management and economic measures without using restrictive and overly-rigid quantitative metrics

- SSF definition in national management/legislation is **typically defined by single/limited number of quantitative metrics**. There is **no individual metric with a cut-off point** capable of distinguishing between small-scale and larger-scale

- The lack of a common characterization and different national definitions and approaches **limit the comparison between countries and regions**

- Need for methods that assess scale without imposing a narrow definition and that allow for a **participatory characterization approach**

Introduction and rationale for the study
Previous work on the matrix

FAO, Coordinating Working Party on Fishery Statistics, 2019 and 2021

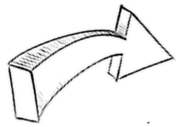
Proposing a ***matrix approach*** for the characterization of SSF to assist national management and enable inter-comparability of data and information on SSF issues. The matrix scoring addresses the **multi-character complexity and inter-regional diversity** of SSF operations

FAO, "*Illuminating Hidden Harvests*", 2023

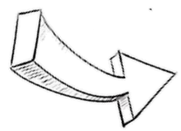
Chapter 3: *Determining scale of operation by identifying general fisheries characteristics.* Applied the Matrix to identify small-scale fisheries in 58 case studies around the world (individual fisheries were scored)

GFCM, WGSSF, 2019

Tested the matrix for characterizing SSF in **Lebanon**, using preliminary data collected through the GFCM socio-economic survey



Potential to provide insights without limiting the characterization to length/gear definition, but considering multidimensional data

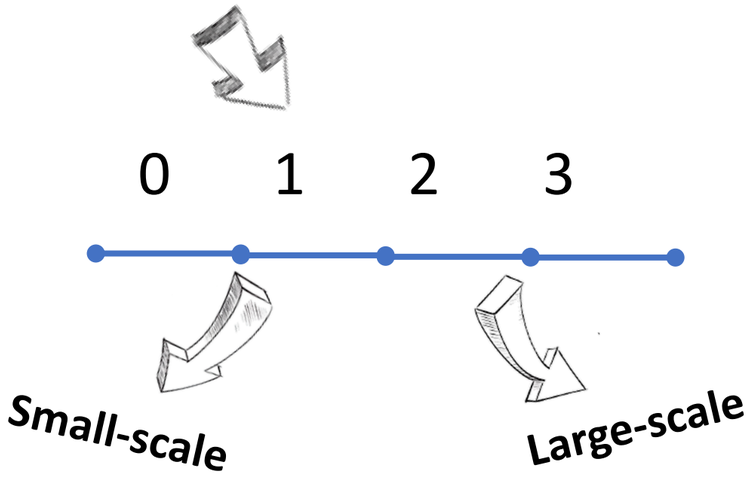


Agreed on further testing the matrix in more CPCs

How the matrix works

	0	1	2	3
Size of fishing vessel	☐ No vessel or vessels <6m	☐ 6-12m	☐ 12-24m	☐ >24m
Gross Tonnage	☐ 0 GT	☐ <10 GT	☐ ≤ 50 GT	☐ > 50 GT
Motorization	☐ no engine	☐ outboard engine/ inboard engine ≤100hp	☐ inboard engine <400hp	☐ inboard >400hp
Mechanization	☐ No mechanization	☐ Small power winch/hauler powered off engine	☐ Independently powered gear deployment/hauling	☐ Fully mechanized gear deployment & hauling
Fishing gear	☐ Labour intensive gear	☐ Passive gear	☐ Active gear, including with aggregating devices	☐ Highly active gear
Refrigeration/Storage on board	☐ no storage	☐ ice box (i.e. on deck)	☐ ice hold (i.e. below deck)	☐ refrigerated hold

- **13 indicators**
- **4 levels**



- **Aggregate score indicates location of the unit on the continuum of SSF to LSF**

How the matrix works

Labour/Crew	☐ Individual and/or family members	☐ ≤2 paid crew	☐ 3 or 4 paid crew	☐ >4 paid crew
Ownership	☐ Owner/operator	☐ Leased arrangement	☐ Owner	☐ Corporate business
Daily trip/multiday	☐ <6 hours	☐ day trip (< 24 hours)	☐ < 4 days	☐ > 4 days
Fishing grounds/zone/ distance from shore	☐ <100 metres from shoreline/baselines/ high-water mark	☐ <5 nautical miles from shoreline	☐ <10 nautical miles	☐ >10 nautical miles from shoreline/ baselines
Disposal of catch	☐ Household consumption/barter (exchange for payment in goods or services)	☐ Local direct sale (exchange for monetary payment)	☐ Sale to traders	☐ Onboard processing and/or delivery to processors
Utilization of catch, Value adding/ preservation	☐ For direct human consumption	☐ Chilled/ locally processed/ cured	☐ Frozen	☐Frozen/chilled for factory processing (for human consumption or fishmeal)

A given fishing unit may have characteristics **typically associated with both smaller-scale and larger-scale fisheries**, so many will receive **lower scores in some categories and higher scores in others**.

By **incorporating multiple dimensions**, the matrix approach overcome rigid definition based on a few variables and cut-off points, seeking to **avoid misleading or inappropriate characterizations of fisheries** as small- or large-scale.

GFCM, WGSSF 2024
Setting the scene

This study expands the testing of the matrix at **national levels** and then applies it to a **regional aggregation**

- **Preliminary analysis:** First attempt to **expand the analysis run in Lebanon to all CPCs**, by considering **available data (but only 7 CPCs had a significant number of available data)**

The lack of common availability in terms of data c**ould not lead to comparable results / aggregate data at the regional level**

Extracted from:
- **DCRF**
- **Socio-economic surveys**
- **Fleet Register**

- **Regional aggregation:** Identify the ***Least Common Denominator*** in terms of **variables that are commonly available** within CPCs and run a **regional analysis**

- **Comparison among CPCs:** Once the matrix and the characterization rules were standardized for all CPCs, the characterization was analyzed at national levels.
Comparison between countries is now possible!

Analysis at the regional level

2076 vessels

Aggregated matrix score ranging from 0 to 20

Six CPCs considered

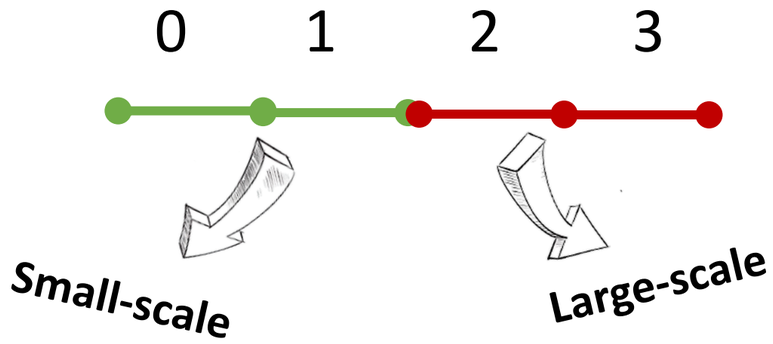
Algeria	Montenegro
Egypt	Tunisia
Lebanon	Türkiye

Least common denominator
in terms of available variables (seven)

	0	1	2	3
Size of fishing vessel	☐ No vessel or <6m	☐ 6-12m	☐ 12-24m	☐ >24m
Fishing gear	☐ Labour intensive gear	☐ Passive gear	☐ Active gear, including with aggregating devices	☐ Highly active gear
Labour/Crew	☐ Individual and/or family members	☐ ≤2 paid crew	☐ 3 or 4 paid crew	☐ >4 paid crew
Ownership	☐ Owner/operator	☐ Leased arrangement	☐ Owner	☐ Corporate business
Daily trip/multiday	☐ <6 hours	☐ day trip (< 24 hours)	☐ < 4 days	☐ > 4 days
Gross Tonnage	☐ 0 GT	☐ <10 GT	☐ ≤ 50 GT	☐ > 50 GT
Motorization	☐ no engine	☐ outboard engine/ inboard engine ≤100hp	☐ inboard engine <400hp	☐ inboard >400hp

Analysis at the regional level – Results
Characterization rule: majority of indicator scores

The categorization is done by considering ***the majority of variables with small-scale or large-scale scores***.



$$IF((Size\ of\ fishing\ vessel \leq 1,\ \ Fishing\ gear \leq 1,\ \ Labor/crew \leq 1,\ \ Ownership\ =\ 0,\ Daily\ trip/multiday\ \leq\ 1,\ \ Gross\ tonnage\ \leq 1,\ \ Engine\ power\ \leq 1) \geq 4,\ "\boldsymbol{Majority\ small-scale}","\boldsymbol{Majority\ large-scale}")$$

- **Small-Scale: total scores from 1 to 9 include only vessels with the majority of *small-scale* indicators** (four to seven variables with *small-scale scores* out of seven variables). They are characterized as **Small-scale** and subdivided into **Very Small Scale** (scores 1 to 5) and **Small Scale** (6 to 9);

- **Large-Scale: total scores from 13 to 21 include only vessels with the majority of *large-scale* indicators** (three to zero variables with *small-scale scores* out of seven variables) They are characterized as **Large-scale** and subdivided into **Large Scale** (scores 13 to 16) and **Very Large Scale** (17 to 21).

- **EDGE: total scores from 10 to 12. The only category that include some vessels with the majority of small-scale indicators and some vessels with the majority of large-scale indicators.** They are respectively characterized as ***Edge small-scale*** (those having four to seven variables with *small-scale scores* out of seven variables) and ***Edge large-scale*** (those having three to zero variables with *small-scale indicators* out of seven variables).

Analysis at the regional level – Results
Averages per fisheries categories

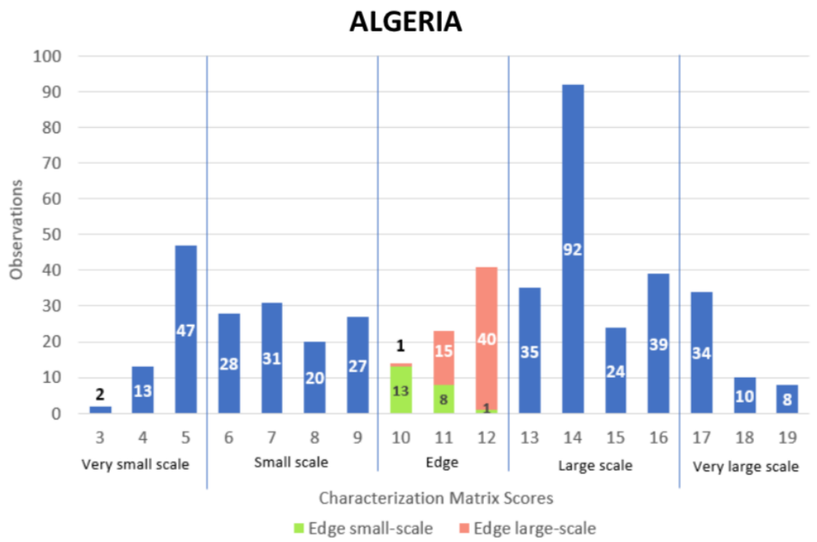
Average Values / Scores *Regional Aggregation (Algeria, Egypt, Lebanon, Montenegro, Tunisia, Türkiye)*		LOA (m) (register)	Size of fishing vessel	Fishing gear	Engaged crew per vessel - daily average	Labor/Crew	Ownership	*Average duration of a fishing trip (hours)*	*Daily trip/multiday*	*Gross Tonnage*	*Gross Tonnage*	*Engine Power*	*Motorization*	AVG TOTAL SCORE
Category	*Score range*	*Value (m)*	*Matrix Score*	*Matrix score*	*Value (n)*	*Matrix Score*	*Matrix Score*	*Value (h)*	*Matrix Score*	*Matrix Score*	*Matrix Score*	*Value (h)*	*Matrix Score*	
Very small scale	1 to 5	5.94	**0.39**	**0.72**	1.42	**0.42**	**0.02**	6.12	**0.53**	1.76	**1.00**	26.48	**0.98**	**4.06**
Small scale	6 to 9	8.42	**0.94**	**1.17**	3.13	**1.63**	**0.20**	15.35	**1.02**	5.67	**1.10**	70.44	**1.24**	**6.90**
Edge Small-scale	10 to 12 **(at least 4 out of 7** SSF conditions)	10.63	**1.22**	**1.83**	5.06	**2.36**	**0.67**	16.18	**1.08**	9.95	**1.42**	161.32	**1.78**	**10.36**
Edge Large-scale	10 to 12 **(less than 4 out of 7** SSF conditions)	13.29	**1.75**	**1.87**	8.15	**2.71**	**0.45**	19.24	**1.11**	18.14	**1.82**	224.70	**1.98**	**11.69**
Large scale	13 to 16	19.38	**2.15**	**2.39**	10.98	**2.83**	**0.96**	23.94	**1.20**	56.35	**2.32**	460.46	**2.57**	14.42
Very large scale	17 to 20	25.00	**2.57**	**2.84**	11.38	**2.98**	**1.82**	119.81	**2.14**	102.54	**2.96**	652.39	**2.96**	18.26

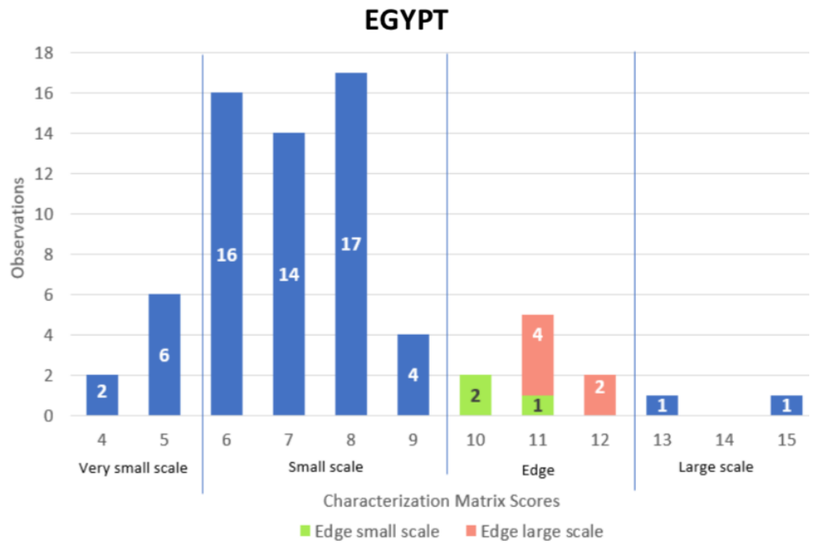
Even with a **limited number of predictors**, the results show that a **multidimensional matrix is a good tool to characterize fisheries**, without limiting the characterization to length/gear or restricted and fixed definition. It is **expected that using more variables** (missing predictors) would **result in more precise pictures of the fleet**

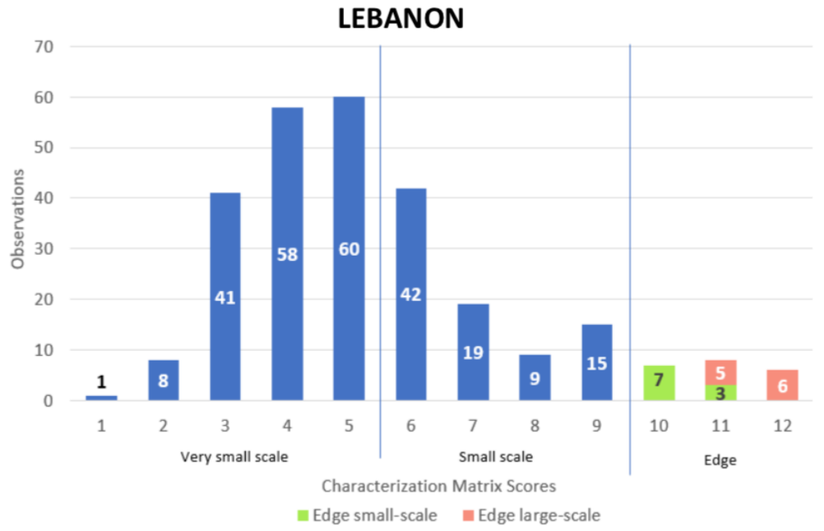
But it would require additional time and resources to carry this out.

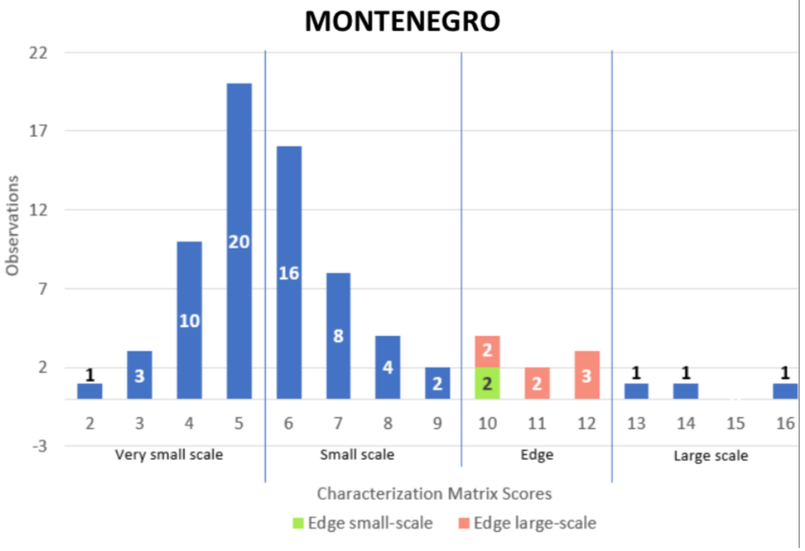
The matrix highlights those fisheries being on the ***edge of small-scale*** *and* ***large-scale*** (e.g. a small vessel with a high-powered engine and large-scale level of fishing effort), assigning them **their own category**

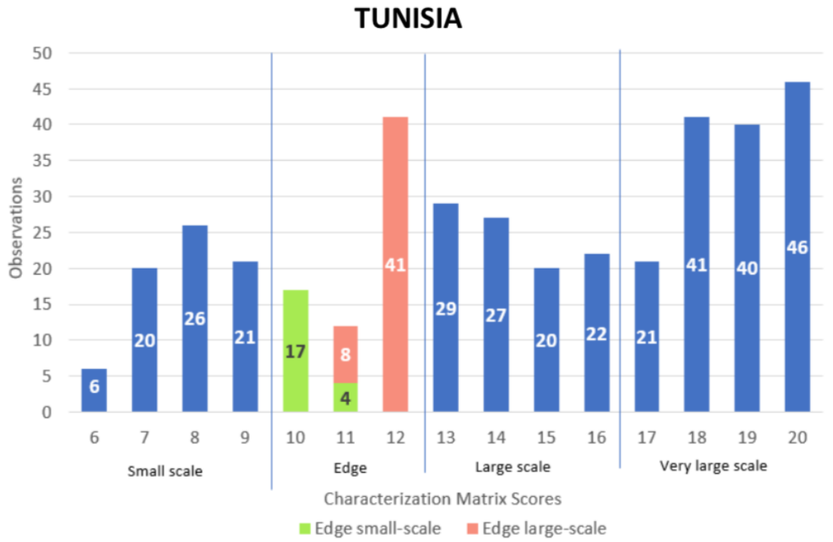
Analysis at the national level – Results
Distribution of scores / fisheries categories

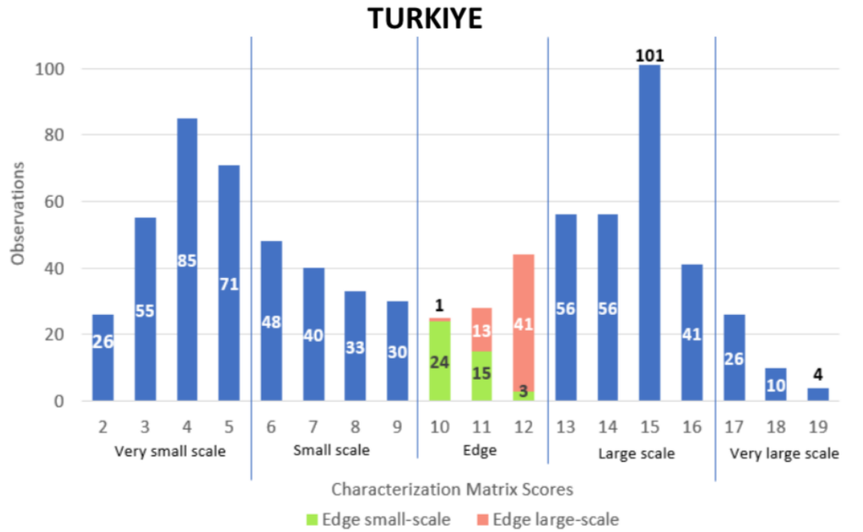




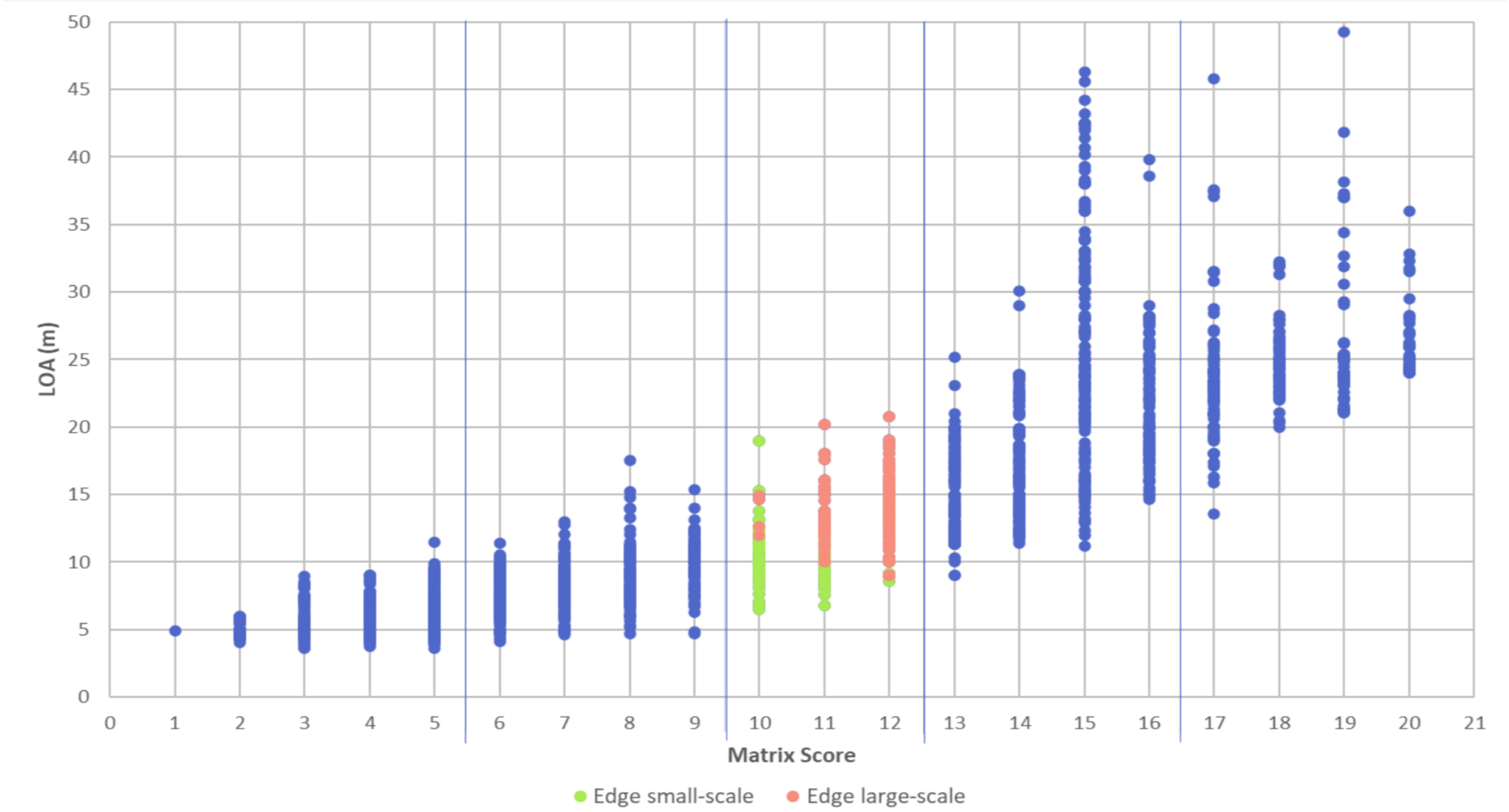








Analysis at the regional level – Results
Distribution of LOAs in the regional aggregation



Analysis at the regional level – Results
Statistical analysis, binomial logistic regression

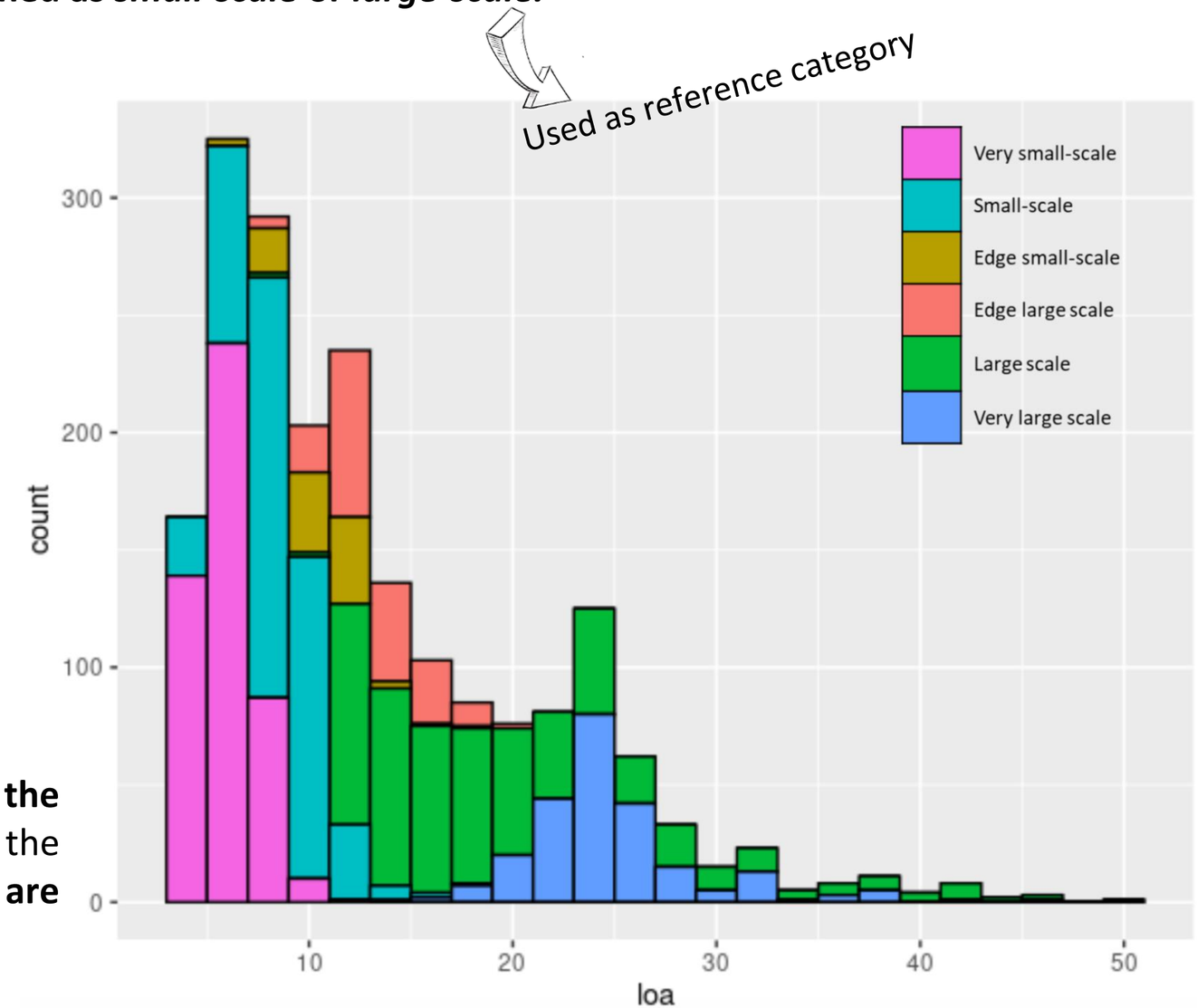
The **multivariate binomial logistic regression validates the capacity of the seven descriptors** to categorize the fishing fleet. The function **forecast the probability of a vessel to be classified as *small-scale* or *large-scale.***

Variable	Estimate	Std. Error	z value	Pr (>|z|)
(Intercept)	71.3368	12.1842	5.855	4.77e-09 (***)
loascore	-9.6175	1.7457	-5.509	3.60e-08 (***)
gearscore	-5.6720	1.0682	-5.310	1.10e-07 (***)
crewscore	-7.3981	1.3097	-5.649	1.62e-08 (***)
ownerscore	-4.7816	0.8315	-5.751	8.90e-09 (***)
tripscore	-5.6315	1.2858	-4.380	1.19e-05 (***)
gtscore	-7.6573	1.6087	-4.760	1.94e-06 (***)
enginescore	-3.8526	0.7378	-5.222	1.77e-07 (***)

note: fish_cat is the dichotomous Dependent Variable, assuming value 1 if *small-scale* and 0 if *large-scale*. Signif. Codes: 0 (***), 0.001 (**), 0.01 (*), 0.05 (.), 0.1 ().

All indicators are highly significant (p < 0.001, *)**

There is **not a single characteristic contributing to determining the scale of fisheries**. Rather, **all indicators**, aggregated in the combination of multiple indices attributable to different scales, **are equally important when determining the scale of fisheries**.



Analysis at the regional level – Results
Fleet segments (DCRF) per matrix score range / fisheries categories

Fleet segment group / Matrix score Range	Count per score range								
	P-01	P-02	P-05	P-06	P-07	P-09	P-10	P-13	L-02
Very small scale	6	2	163	80		130	107	10	5
Small scale	6	13	35	233	1	5	122	1	16
Edge Small Scale				31	2		3		
Edge Large Scale				15	27		2		
Large Scale				7	24				
Very Large Scale					1				

Fleet segment group / Matrix score Range	Count per score range								
	P-11	P-14	L-03	D-03	S-02	S-03	S-04	S-07	S-08
Very small scale					1				
Small scale	9		8		20	2			
Edge Small Scale	15				17	3			
Edge Large Scale	18	3	2	2	40	51			
Large Scale	4	12		9	43	149	65		
Very Large Scale						1	20	4	13

Small-scale fleet segment group, as defined in SoMFI, is **highlighted in yellow**

Fleet segment group / Matrix score Range	Count per score range							
	T-01	T-02	T-03	T-04	T-07	T-08	T-11	T-12
Very small scale								
Small scale	1	19					1	
Edge Small Scale		26					2	
Edge Large Scale		2	6		1		15	
Large Scale		1	10	2	16	5	166	34
Very Large Scale					7	7	95	92

Analysis at the regional level – Results
Fleet segments (DCRF) per matrix score range / fisheries categories

Fleet segment group / Matrix score Range	Count per score range									Count per score range								
	P-01	P-02	P-05	P-06	P-07	P-09	P-10	P-13	L-02	P-11	P-14	L-03	D-03	S-02	S-03	S-04	S-07	S-08
Very small scale	6	2	163	80		130	107	10	5					1				
Small scale	6	13	35	233	1	5	122	1	16	9		8		20	2			
Edge Small Scale				31	2		3			15				17	3			
Edge Large Scale				15	27		2			18	3	2	2	40	51			
Large Scale				7	24					4	12		9	43	149	65		
Very Large Scale					1										1	20	4	13

Small-scale fleet segment group, as defined in SoMFI, is **highlighted in yellow**

92% of vessels **categorized as small-scale by the matrix coincide with the SoMFI** small-scale fleet segment group

Fleet segment group / Matrix score Range	Count per score range							
	T-01	T-02	T-03	T-04	T-07	T-08	T-11	T-12
Very small scale								
Small scale	1	19					1	
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	P-01	P-02	P-05	P-06	P-07	P-09	P-10	P-13	L-02
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Small scale	6	13	35	233	1	5	122	1	16
Edge Small Scale				31	2		3		
Edge Large Scale				15	27		2		
Large Scale				7	24				
Very Large Scale					1				

Fleet segment group / Matrix score Range	Count per score range								
	P-11	P-14	L-03	D-03	S-02	S-03	S-04	S-07	S-08
Very small scale					1				
Small scale	9		8		20	2			
Edge Small Scale	15				17	3			
Edge Large Scale	18	3	2	2	40	51			
Large Scale	4	12		9	43	149	65		
Very Large Scale						1	20	4	13

Small-scale fleet segment group, as defined in SoMFI, is **highlighted in yellow**

92% of vessels **categorized as small-scale by the matrix coincide with the SoMFI** small-scale fleet segment group

but there are some exceptions

Fleet segment group / Matrix score Range	Count per score range							
	T-01	T-02	T-03	T-04	T-07	T-08	T-11	T-12
Very small scale								
Small scale	1	19					1	
Edge Small Scale		26					2	
Edge Large Scale		2	6		1		15	
Large Scale		1	10	2	16	5	166	34
Very Large Scale					7	7	95	92

Using the matrix for management measures

Fleet segment groups (SOMFI) per matrix score range / fisheries categories

Fleet segment group / Matrix score Range	Count per score range									Count per score range									
	P-01	P-02	P-05	P-06	P-07	P-09	P-10	P-13	L-02	P-11	P-14	L-03	D-03	S-02	S-03	S-04	S-07	S-08
Very small scale	6	2	163	80		130	107	10	5					1				
Small scale	6	13	35	233	1	5	122	1	16	9		8		20	2			
Edge Small Scale				31	2		3			15				17	3			
Edge Large Scale				15	27		2			18	3	2	2	40	51			
Large Scale				7	24					4	12		9	43	149	65		
Very Large Scale					1										1	20	4	13

Fleet segment group / Matrix score Range	Count per score range							
	T-01	T-02	T-03	T-04	T-07	T-08	T-11	T-12
Very small scale								
Small scale	1	19					1	
Edge Small Scale		26					2	
Edge Large Scale		2	6		1		15	
Large Scale		1	10	2	16	5	166	34
Very Large Scale					7	7	95	92

89%

Purse Seiners are characterized as **large-scale…**

Using the matrix for management measures
Case study one: Sardinella fisheries in Lebanon

LEBANON	Count per score range:					
Fleet Segment / Score Range	P-05	P-06	P-13	P-11	S-02	S-03
Very small scale	88	69	10		1	
Small scale		70	1	3	10	1
Edge Small Scale		3		2	3	2
Edge Large Scale				4		7
Large Scale						
Very Large Scale						

…but in Lebanon, 70% of **purse seiners** fall under **small-scale categories**

Small-scale characteristics

- **Fishing trip lasting less than 10 hours** (100% of vessels)
- **Owner working on board** (80%)
- **GT < 10** (75%)
- **Engine power < 100 hp** (70%)
- **LOA < 12 mt** (60%)

Large-scale characteristics

- **Active gear**
- **> 4 crew on board** (71% of vessels)

Using the matrix for management measures
Case study one: Sardinella fisheries in Lebanon

LEBANON	Count per score range:					
Fleet Segment / Score Range	P-05	P-06	P-13	P-11	S-02	S-03
Very small scale	88	69	10		1	
Small scale		70	1	3	10	1
Edge Small Scale		3		2	3	2
Edge Large Scale				4		7
Large Scale						
Very Large Scale						

…but in Lebanon, 70% of **purse seiners** fall under **small-scale categories**

Management of this fishery may benefit from a **more participatory approaches in management** – often linked to SSF – rather than a more traditional top-down management approach, as often is the case with industrial fisheries.

Small-scale characteristics

- **Fishing trip lasting less than 10 hours** (100% of vessels)
- **Owner working on board** (80%)
- **GT < 10** (75%)
- **Engine power < 100 hp** (70%)
- **LOA < 12 mt** (60%)

Using the matrix for management measures
Case study two: Beam trawlers in Türkiye

TURKIYE	Count per score range:													
Fleet Segment / Score Range	P-09	P-10	P-11	D-03	S-03	S-04	T-01	T-02	T-03	T-04	T-07	T-08	T-11	T-12
Very small scale	130	107												
Small scale	5	122	4				1	19						
Edge Small Scale		3	13					26						
Edge Large Scale		2	14	2	19			2	6		1		9	
Large Scale			4	9	20	55		1	10	2	16	5	99	33
Very Large Scale						12					7	7	5	9

In Türkiye, 94% of **beam trawlers** fall under **small-scale categories**

Large-scale characteristics

- **Active gear**
- **Engine power > 100 hp** (80% of vessels)

Small-scale characteristics

- **LOA < 12 mt** (100% of vessels)
- **Fishing trip lasting less than 12 hours** (100%)
- **Less than 4 crew on board** (96%)
- **GT < 10** (80%)
- **Owner working on board** (80%)

Matrix results for SSF2 countries
Tunisia – Matrix with 7 indicators

Average values and scores per fisheries category (7 indicators)

Average Values / Scores *TUNISIA*		LOA (m) (register)	Size of fishing vessel	Fishing gear	Engaged crew per vessel - daily average	Labor/Crew	Ownership	*Average duration of a fishing trip (hours)*	*Daily trip/multiday*	*Gross Tonnage*	*Gross Tonnage*	*Engine Power*	*Motorization*	AVG TOTAL SCORE
Category	***Score range***	***Value (m)***	***Matrix Score***	***Matrix score***	***Value (n)***	***Matrix Score***	***Matrix Score***	***Value (h)***	***Matrix Score***	***Value (GT)***	***Matrix Score***	***Value (hp)***	***Matrix Score***	
Very small scale	1 to 5													
Small scale	6 to 9	9.93	**1.01**	**0.97**	4.03	**2.14**	**0.05**	43.78	**1.48**	7.89	**1.15**	51.98	**1.04**	**7.85**
Edge Small-scale	10 to 12 (**at least 4 out of 7** SSF conditions)	11.03	**1.1**	**1.1**	5.24	**2.67**	**0.86**	40	**1.43**	9.98	**1.48**	105.56	**1.57**	**10.19**
Edge Large-scale	10 to 12 (**less than 4 out of 7** SSF conditions)	14.44	**1.7**	**1.53**	8.18	**2.92**	**0.08**	37.84	**1.45**	22.08	**1.98**	202.79	**1.98**	**11.84**
Large scale	13 to 16	17.78	**2.06**	**2.02**	10.21	**2.99**	**0.65**	74.62	**2**	44.15	**2.26**	372.8	**2.34**	14.36
Very large scale	17 to 20	25.12	**2.62**	**2.82**	12.78	**3**	**1.70**	163.4	**2.71**	104.54	**2.96**	611.18	**2.93**	18.75

Matrix results for SSF2 countries
Tunisia – Matrix with 7 indicators

Fleet segment groups per matrix score range

Fleet segment group / Matrix score Range	Count per score range										Total Count
	P-06	P-07	P-14	S-02	S-03	S-04	S-07	S-08	T-11	T-12	
Very small scale											0
Small scale	71	1		1							73
Edge Small Scale	17	2		2							21
Edge Large Scale	2	27	3	2	15						49
Large Scale	5	24	12		32	9			16		98
Very Large Scale		1			1	8	4	13	55	66	148

Fleet segments defined as small-scale in SoMFI are highlighted in yellow

Matrix results for SSF2 countries
Türkiye – Matrix with 7 indicators

Average values and scores per fisheries category (7 indicators)

Average Values / Scores *TURKIYE*		LOA (m) (register)	Size of fishing vessel	Fishing gear	Engaged crew per vessel - daily average	Labor/Crew	Ownership	*Average duration of a fishing trip (hours)*	*Daily trip/multiday*	*Gross Tonnage*	*Gross Tonnage*	*Engine Power*	*Motorization*	AVG TOTAL SCORE
Category	***Score range***	***Value (m)***	***Matrix Score***	***Matrix score***	***Value (n)***	***Matrix Score***	***Matrix Score***	***Value (h)***	***Matrix Score***	***Value (GT)***	***Matrix Score***	***Value (hp)***	***Matrix Score***	
Very small scale	1 to 5	6.16	**0.45**	**0.64**	1.33	**0.33**	**0.03**	5.5	**0.39**	**2.14**	**1**	**22.88**	**1**	**3.85**
Small scale	6 to 9	8.39	**0.99**	**1.34**	2.35	**1.26**	**0.21**	11.74	**0.94**	**5.2**	**1.11**	**97.8**	**1.44**	**7.3**
Edge Small-scale	10 to 12 (**at least 4 out of 7** SSF conditions)	10.72	**1.31**	**2.29**	3.17	**1.88**	**0.38**	9.74	**1**	**9.76**	**1.97**	**238.08**	**2.07**	**10.5**
Edge Large-scale	10 to 12 (**less than 4 out of 7** SSF conditions)	14.06	**1.93**	**2.13**	5.96	**2.35**	**0.29**	13.77	**1**	**18.82**	**2**	**279.53**	**2.04**	**11.73**
Large scale	13 to 16	25.36	**2.37**	**2.68**	9.54	**2.66**	**0.3**	13.44	**1.03**	**83.69**	**2.57**	**607.04**	**2.89**	**14.5**
Very large scale	17 to 20	28.42	**2.7**	**2.7**	10.03	**2.88**	**2**	85.1	**1.18**	**124.71**	**3**	**831.97**	**3**	**17.45**

Matrix results for SSF2 countries
Türkiye – Matrix with 7 indicators

Fleet segment groups per matrix score range

Fleet segment group / Matrix score Range	Count per score range										Count per score range				Total Count
	P-09	P-10	P-11	D-03	S-03	S-04	T-01	T-02	T-03	T-04	T-07	T-08	T-11	T-12	
Very small scale	130	107													237
Small scale	5	122	4				1	19							151
Edge Small Scale		3	13					26							42
Edge Large Scale		2	14	2	19			2	0		1		9		49
Large Scale			4	9	20	55		1	10	2	16	5	99	33	254
Very Large Scale						12					7	7	5	9	40

Fleet segments defined as small-scale in SoMFI are highlighted in yellow

Matrix results for SSF2 countries
Croatia – Reduced matrix with 4 indicators

Average values and scores per fisheries category (4 indicators)

Average Values / Scores CROATIA		LOA (m) (register)	Size of fishing vessel	Fishing gear	*Gross Tonnage*	*Gross Tonnage*	*Engine Power*	*Motorization*	AVG TOTAL SCORE
Category	*Score range*	*Value (m)*	*Matrix Score*	*Matrix score*	*Value (n)*	*Matrix Score*	*Value (hp)*	*Matrix Score*	
Very small scale	1 to 2	4.58	**0**	**0.55**	0.8	**1**	8.95	**0.42**	1.97
Small scale	3 to 5	6.09	**0.48**	**1**	1.95	**1**	27.25	**1.06**	3.54
Edge Small-scale	6 to 7 (**at least 3 out of 4** SSF conditions)	10.41	**1.1**	**2.48**	7.36	**1.21**	133.21	**1.55**	6.33
Edge Large-scale	6 to 7 (**less than 3 out of 4** SSF conditions)	12.34	**1.67**	**1.33**	12.79	**2**	226.64	**2**	7
Large scale	8 to 10	16.53	**2.02**	**2.66**	38.46	**2.22**	234.96	**2.04**	8.94
Very large scale	11 to 12	28.83	**3**	**2.45**	160.82	**3**	623.73	**2.9**	11.36

Matrix results for SSF2 countries
Croatia – Reduced matrix with 4 indicators

Fleet segment groups per matrix score range

Fleet segment group / Matrix score Range	Count per score range																	Total Count
	P-01	P-05	P-06	P-07	P-09	P-10	L-01	L-02	P-11	S-02	S-03	S-04	D-02	D-03	T-10	T-11	T-12	
Very small scale	22				16													38
Small scale		432	336		37	82	8	25	1	3								924
Edge Small Scale			1			4		1	1	2			1		21	2		36
Edge Large Scale				1					1	1								3
Large Scale									2		11	2		1	1	33		50
Very Large Scale												6					5	11

Fleet segments defined as small-scale in SoMFI are highlighted in yellow

Total Vessels in DCRF: 10 579
Sample: 1 058

Matrix results for SSF2 countries
Italy – Reduced matrix with 4 indicators

Average values and scores per fisheries category (4 indicators)

Average Values / Scores *ITALY*		LOA (m) (register)	Size of fishing vessel	Fishing gear	*Gross Tonnage*	*Gross Tonnage*	*Engine Power*	*Motorization*	AVG TOTAL SCORE
Category	*Score range*	*Value (m)*	*Matrix Score*	*Matrix score*	*Value (n)*	*Matrix Score*	*Value (hp)*	*Matrix Score*	
Very small scale	1 to 2	4.99	**0**	**1**	1	**1**	0	**0**	2
Small scale	3 to 5	7.54	**0.84**	**1.12**	2.19	**1**	34.38	**0.96**	4
Edge Small-scale	6 to 7 (**at least 3 out of 4** SSF conditions)	10.99	**1.25**	**2.67**	6.62	**1.12**	91.2	**1.25**	6.28
Edge Large-scale	6 to 7 (**less than 3 out of 4** SSF conditions)	14.24	**2**	**1.36**	15.29	**1.75**	172.77	**1.86**	6.96
Large scale	8 to 10	15.83	**2**	**2.9**	28.18	**2.12**	165.36	**1.87**	8.89
Very large scale	11 to 12	27.65	**2.8**	**2.92**	143.17	**3**	517.45	**2.8**	11.46

Matrix results for SSF2 countries
Italy – Reduced matrix with 4 indicators

Fleet segment groups per matrix score range

Fleet segment group / Matrix score Range	Count per score range																			
	P-01	P-02	P-05	P-06	P-07	P-10	L-01	L-02	P-11	L-03	S-01	S-02	S-03	S-04	D-02	D-03	T-02	T-07	T-10	T-11	T-12
Very small scale	33																				
Small scale	7	39	38	102	2	1	52	275		3	10	101									
Edge Small Scale				1	2			2		2		7	2		14	3	1		26	8	
Edge Large Scale					1				1	15			11								
Large Scale										1			21	5	3	58		1	1	188	
Very Large Scale														4						11	33

Fleet segments defined as small-scale in SoMFI are highlighted in yellow

Total Vessels in DCRF: 10 934
Sample: 1 093

	Total Count
Very small scale	33
Small scale	625
Edge small scale	68
Edge large scale	28
Large scale	278
Very large scale	48

Matrix results for SSF2 countries
Spain – Reduced matrix with 4 indicators

Average values and scores per fisheries category (4 indicators)

Average Values / Scores *SPAIN*		LOA (m) (register)	**Size of fishing vessel**	**Fishing gear**	*Gross Tonnage*	***Gross Tonnage***	*Engine Power*	***Motorization***	**AVG TOTAL SCORE**
Category	***Score range***	***Value (m)***	***Matrix Score***	***Matrix score***	***Value (n)***	***Matrix Score***	***Value (hp)***	***Matrix Score***	
Very small scale	1 to 2								
Small scale	3 to 5	8.29	**0.92**	**1**	3.3	**1**	32	**1**	3.94
Edge Small-scale	6 to 7 (**at least 3 out of 4** SSF conditions)	13.03	**1.73**	**1.64**	14.23	**1.73**	61.7	**1**	6.1
Edge Large-scale	6 to 7 (**less than 3 out of 4** SSF conditions)	14.82	**2**	**1.36**	20.3	**2**	111.63	**1.63**	7
Large scale	8 to 10	19.38	**2.09**	**2.57**	49.17	**2.43**	162.09	**1.82**	8.9
Very large scale	11 to 12	24.97	**3**	**3**	94.6	**3**	279.89	**2**	11

Matrix results for SSF2 countries
Spain – Reduced matrix with 4 indicators

Fleet segment groups per matrix score range

Fleet segment group / Matrix score Range	Count per score range												Total Count
	P-05	P-06	P-07	P-08	L-02	L-03	L-04	S-03	S-04	T-10	T-11	T-12	
Very small scale													0
Small scale	16	119	5		3								143
Edge Small Scale			5			2		1		3			11
Edge Large Scale			2			5		4					11
Large Scale				1		1	2	17	1		41		63
Very Large Scale												15	15

Fleet segments defined as small-scale in SoMFI are highlighted in yellow

Total Vessels in DCRF: 2 454
Sample: 245

Matrix results for SSF2 countries
Greece – Reduced matrix with 4 indicators

Average values and scores per fisheries category (4 indicators)

Average Values / Scores GREECE		LOA (m) (register)	Size of fishing vessel	Fishing gear	*Gross Tonnage*	*Gross Tonnage*	*Engine Power*	*Motorization*	AVG TOTAL SCORE
Category	***Score range***	***Value (m)***	***Matrix Score***	***Matrix score***	***Value (n)***	***Matrix Score***	***Value (hp)***	***Matrix Score***	
Very small scale	1 to 2	4.63	**0**	**0.53**	0.58	**1**	3.93	**0.44**	1.98
Small scale	3 to 5	6.75	**0.63**	**0.99**	2.17	**1.01**	20.88	**1**	3.62
Edge Small-scale	6 to 7 (**at least 3 out of 4** SSF conditions)	12.84	**1.79**	**1.21**	16.58	**1.83**	76.55	**1.17**	6
Edge Large-scale	6 to 7 (**less than 3 out of 4** SSF conditions)	14.65	**2**	**1.13**	20.93	**2**	118.91	**1.8**	6.93
Large scale	8 to 10	19.74	**2.07**	**2.51**	41.21	**2.21**	203.21	**1.95**	8.82
Very large scale	11 to 12	29.79	**3**	**3**	167.18	**3**	393.19	**2.24**	11.24

Matrix results for SSF2 countries
Greece – Reduced matrix with 4 indicators

Fleet segment groups per matrix score range

Fleet segment group / Matrix score Range	Count per score range										Count per score range						
	P-01	P-02	P-05	P-06	P-07	P-09	P-10	L-01	L-02	P-11	L-03	S-02	S-03	S-04	D-02	T-11	T-12
Very small scale	24					19											
Small scale		5	107	149		166	326	185	272	3		1					
Edge Small Scale					5				3	7	11				3		
Edge Large Scale					4					9	11		6				
Large Scale													24	3		27	1
Very Large Scale																	34

Fleet segments defined as small-scale in SoMFI are highlighted in yellow

Total Vessels in DCRF: 27 128
Sample: 1 406

	Total Count
Very small scale	43
Small scale	1214
Edge small scale	29
Edge large scale	30
Large scale	55
Very large scale	34

Matrix results for SSF2 countries
France – Reduced matrix with 4 indicators

Average values and scores per fisheries category (4 indicators)

Average Values / Scores *FRANCE*		LOA (m) (register)	Size of fishing vessel	Fishing gear	*Gross Tonnage*	*Gross Tonnage*	*Engine Power*	*Motorization*	AVG TOTAL SCORE
Category	***Score range***	***Value (m)***	***Matrix Score***	***Matrix score***	***Value (n)***	***Matrix Score***	***Value (hp)***	***Matrix Score***	
Very small scale	1 to 2	5.8	**0**	**1**	0.58	**1**	0	**0**	2
Small scale	3 to 5	7.22	**0.75**	**1**	2.35	**1**	72.82	**1.26**	4.01
Edge Small-scale	6 to 7 (**at least 3 out of 4** SSF conditions)	11.40	**1.25**	**1.5**	10.5	**1.63**	128.88	**1.63**	6
Edge Large-scale	6 to 7 (**less than 3 out of 4** SSF conditions)	15.57	**2**	**1**	29.82	**2**	260.67	**2**	7
Large scale	8 to 10	20.1	**2**	**2.8**	64.71	**2.6**	349.8	**2.2**	9.6
Very large scale	11 to 12	25.19	**3**	**3**	122.95	**3**	316	**2**	11

Matrix results for SSF2 countries
France – Reduced matrix with 4 indicators

Fleet segment groups per matrix score range

Fleet segment group / Matrix score Range	Count per score range									Count per score range					Total Count
	P-01	P-05	P-06	P-07	P-09	P-10	L-01	L-02	P-11	L-03	S-03	D-02	T-11	T-12	
Very small scale	1														1
Small scale		10	55	1	6	24	10	4							110
Edge Small Scale			3	1				1		2		2			9
Edge Large Scale									2						2
Large Scale											1		4		5
Very Large Scale														4	4

Fleet segments defined as small-scale in SoMFI are highlighted in yellow

Total Vessels in DCRF: 1 389
Sample: 139

Using the matrix for management measures
Lessons learnt and discussion

The wide heterogeneity of small-scale fisheries around the Mediterranean and Black Sea challenges the inter-comparability between countries. **The matrix is more flexible and adaptable methodology. It provides a standardized approach and a common set of criteria that can be applied objectively to identify the differentiation between small-scale and large-scale fishing units**.

- **The matrix represents a valuable instrument to help managers identify where vessels/a fishery tends towards the small-scale of the spectrum (low aggregate score),** and therefore could benefit from the involvement in a participatory approach to management.

- A more dynamic set of characteristics – particularly *duration of fishing trip*, *engaged crew*, *presence of owner on board*, *gross tonnage* and *engine power* (all combined with length and gear type) – provide additional useful indications of the scale of a vessel or fishery

  Among missing indicators that could be added to the matrix, particular attention could be given to ***distance from shore*** and ***disposal of catch***.

- The two case studies showcase how, despite using active gears, certain vessels/fisheries may have small-scale characteristics. As such **their effective management could benefit from a more participatory approach** - in line with those promoted for SSF

Thank you for your attention

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