

FAO VOLUNTARY GUIDELINES ON THE MARKING OF FISHING GEAR AND RISK ASSESSMENT



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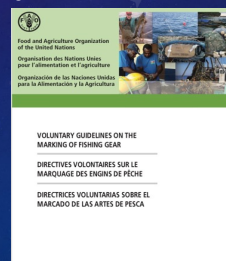
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on behalf of
FAO Fisheries and Aquaculture, Fishing Technology and Operations

1

THE FAO VOLUNTARY GUIDELINES ON THE MARKING OF FISHING GEAR

- Developed through the 2016 Expert Consultation on the Marking of Fishing Gear and the 2018 Technical Consultation on the Marking of Fishing Gear
- Endorsed by the 33rd Session by FAO Committee on Fisheries in 2018
- Considers gear marking as an important component of broader fisheries management measures
- Views gear marking as an important tool in combating ALDFG and IUU fishing
- Requires that a risk assessment be undertaken when implementing a system for gear marking



<http://www.fao.org/f/a/c3546/c3546.pdf>

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2

2

KEY PROVISIONS OF THE GUIDELINES

- Voluntary in nature, global in scope and applicable to all fishing gear types
- Identification of the ownership and the position of fishing gear, and association with the vessel
- Requirements for reporting/recovery/disposal
- A condition of fishing authorization or license
- Guidance on:
 - How the gear should be marked
 - Reporting/recovery /disposal of ALDFG
 - Recycling/reuse /re-purpose of the end-of-life fishing gear
 - Commercial traceability of fishing gear

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3

3

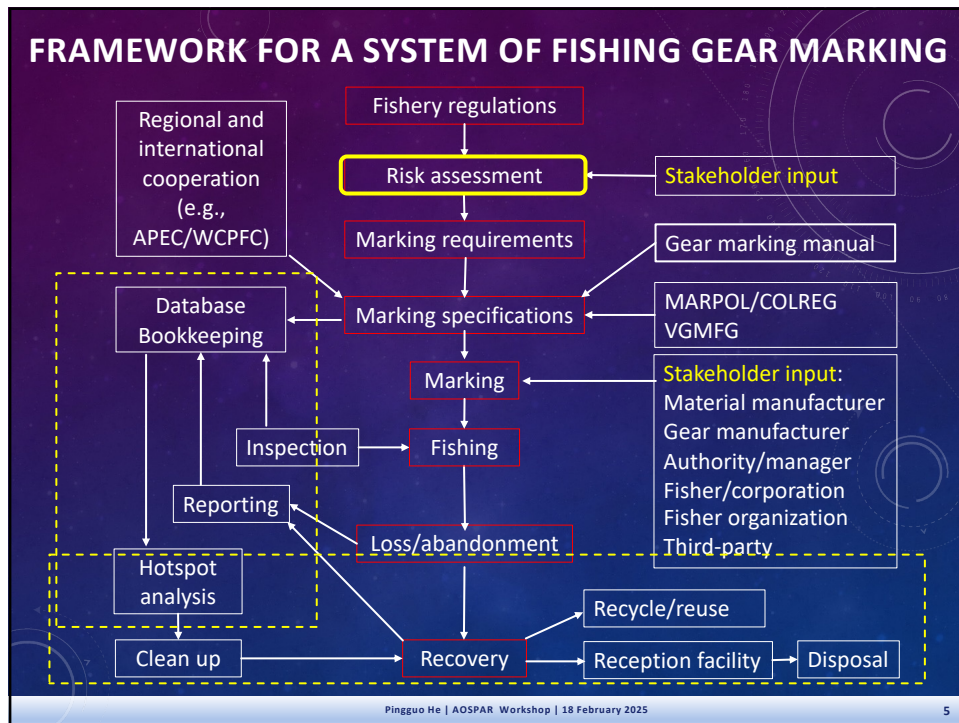
THE PURPOSE OF FISHING GEAR MARKING

- Locating and identifying the ownership of fishing gear
- Capacity control /over capacity
- Legality of the fishing gear (IUU)
- Tracing the origin of the gear when it become ALDFG, esp. when entangled on an animal
- Identification of ALDFG hotspots through reporting
- Facilitation of recovery of ALDFG

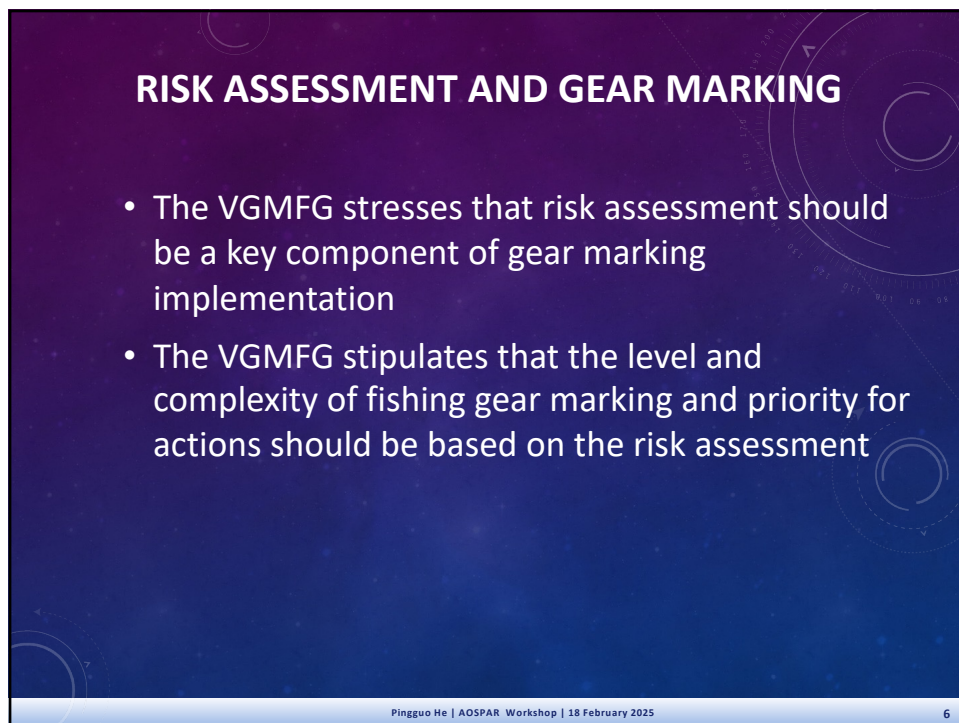
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4

4



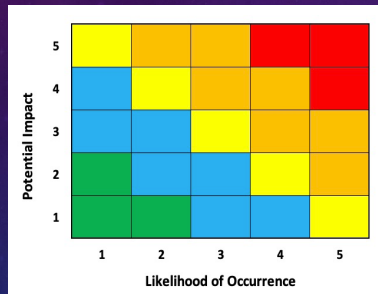
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6

RISK ASSESSMENT

Risk = Likelihood of occurrence x Potential impact



Steps for a risk assessment:

- Identification and estimation of the consequence (**potential impact**) of the lack of a gear marking system in the fishery under consideration
- Estimation of the **likelihood of occurrence** of the identified impacts, occurring as a result of the lack of a gear marking system
- Scoring of the risk
- Categorization of the risk

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7

7

FISHING GEAR MARKING RISK ASSESSMENT: POTENTIAL RISKS

- **Environmental** impact (plastic pollution)
- **Ecological** impact (ghosting fishing; impact on ETP species; habitats vulnerability and fragility)
- **Economic** impact (gear replacement costs, loss of fishing time; and cost of implementation; considers economic nature of the fishery, e.g., subsistence, artisanal, small-scale, industrial; IUU fishing;)
- **Technological** impact (Gear types; numbers of gear units; numbers of vessels; method of operation; marking technology)
- **Safety and navigational** impact (risks to the vessel operating the gear, risk to other fishing vessels and non-fishing vessels; risks to other ocean users, e.g., divers, beach goers)

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8

8

RISK ASSESSMENT FOR GEAR MARKING

- Likelihood of occurrence of different risks if the gear is not marked or not adequately marked
- Importance/impact of different types of risks

Apply to:

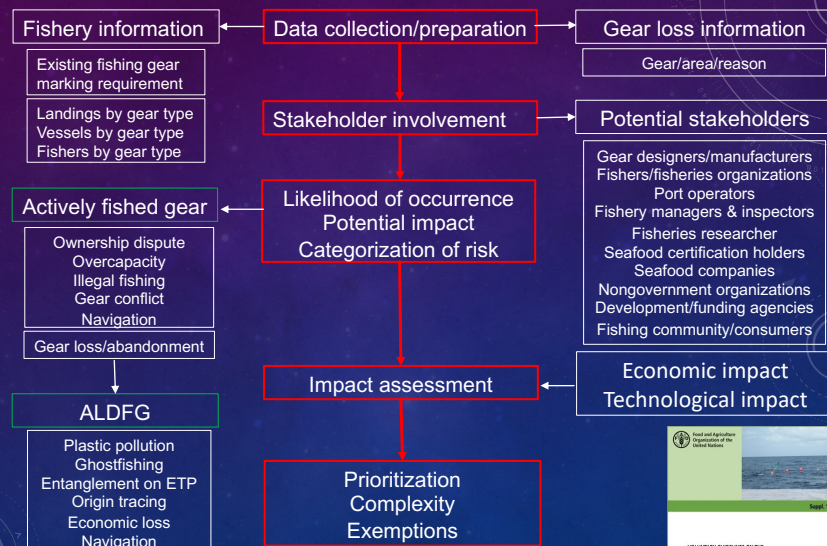
- Fishing gears in normal fishing conditions
- Fishing gears that have been abandoned, lost or otherwise discarded (ALDFG)

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9

9

FRAMEWORK OF RISK ASSESSMENT FOR THE MARKING OF FISHING GEAR



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10

10

POTENTIAL IMPACT

- Identified through stakeholder input
- Often location and fishery specific
- Implies the matters that are important to the stakeholder or the fishery
- Scores of impact are gear specific

For example:

- Gear loss
- Plastic pollution
- Ghostfishing
- Navigation
- Economic loss



https://i.ytimg.com/vi/QB_9AX4BUBs/mqdefault.jpg

11

LIKELIHOOD OF OCCURRENCE

More technical in nature, and location/region specific



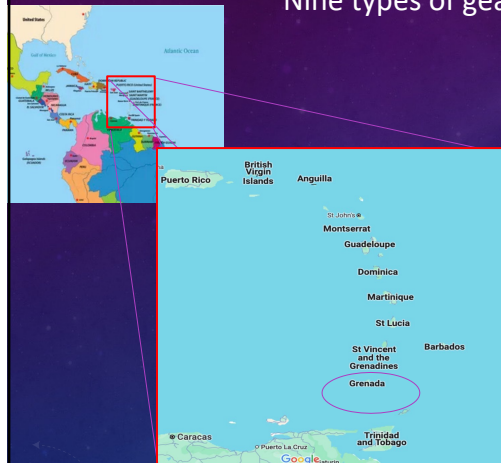
For examples for gear loss:

- Type of gear and operation
- Weather/sea/bottom conditions of areas the gear is used
- Level of effort/amount of gear used
- Likelihood of equipment failure and human error, and skill level of operators

12

EXAMPLE: GRENADA

Nine types of gears plus one type of FAD are in use:



- **Tended gear**
 - Beach seines
 - Handlines
 - Trolling lines
 - Spears
- **Untended gear**
 - Set gillnets (near or on bottom)
 - Set longlines (near or on bottom)
 - Drift longlines (pelagic longlines)
 - Droplines/Vertical lines (on aFADs, drift)
 - Pots (traps)
- **Fish aggregation devices (FADs)**
 - Anchored FADs (aFADs)

13

IDENTIFICATION OF RISKS

Two categories:

1. Fishing gears under normal fishing conditions
2. After the gear become ALDFG

14

EXAMPLES OF TYPES OF RISKS

Identified through stakeholder input

Fishing gear in normal fishing conditions

Gear loss

Ownership dispute

Overcapacity

Illegal fishing

Gear conflict

Navigation

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15

15

LIKELIHOOD OF OCCURRENCE: FISHING GEAR UNDER NORMAL FISHING CONDITION GRENADA FISHING GEARS

Table 2. An example of scoring likelihoods of occurrence

Gear type	Gear in normal fishing conditions – Likelihood of occurrence (1–5)					
	Gear loss	Ownership dispute	Overcapacity	Illegal fishing	Gear conflict	Navigation hazard
Beach seine	1	1	1	1	2	1
Set gillnets	4	5	3	1	3	4
Pots	4	5	3	1	5	3
Handlines	2	1	1	1	1	1
Set longline	3	2	5	1	3	2
Drift longlines	5	2	5	5	5	4
Vertical longline	3	2	5	1	3	4
Trolling lines	2	1	1	5	1	2
Spear	1	1	1	5	1	1
aFAD	4	1	2	1	4	5

Note: Scores for different risks for Grenada fishing gears when they are in normal fishing conditions (where 1 is lowest and 5 is highest), based on their design characteristics, fishing mechanism, and operation

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16

16

POTENTIAL IMPACT: FISHING GEAR UNDER NORMAL FISHING CONDITION GRENADA FISHING GEARS

Table 4. An example of scoring the impact of risks through stakeholder surveys on the importance or relevance of different risk types

A	B	C	D	E	F	G	H	I
Gear type	Gear in normal fishing conditions – impact score (1–5)						Mean impact score	Rescaled mean impact score
	Gear loss	Owner. Dispute	Over capacity	Illegal fishing	Gear conflict	Nav. hazard		
Beach seine	2.7	3.0	1.6	2.5	2.8	3.0	2.6	3
Set gillnets	3.6	4.0	2.1	3.3	3.8	4.0	3.4	4
Pots	2.7	3.0	1.6	2.5	2.8	3.0	2.6	3
Handlines	4.5	4.9	2.6	4.1	4.7	4.9	4.3	5
Set longline	3.6	4.0	2.1	3.3	3.8	4.0	3.4	4
Drift longlines	4.5	4.9	2.6	4.1	4.7	4.9	4.3	5
Vertical longline	1.8	2.0	1.0	1.6	1.9	2.0	1.7	2
Trolling lines	4.5	4.9	2.6	4.1	4.7	4.9	4.3	5
Spear	0.9	1.0	0.5	0.8	0.9	1.0	0.9	1
aFAD	3.6	4.0	2.1	3.3	3.8	4.0	3.4	4

Note: Impact scores when the gear is in normal fishing conditions for Grenada fishing gears, considering the gear's importance as provided in Table 1. Mean impact scores are rescaled to 1–5.

17

EXAMPLE: RISK OF GEAR LOSS FISHING GEAR UNDER NORMAL FISHING CONDITION GRENADA FISHING GEARS

Risk of Gear Loss

Table 8. An example of likelihood–impact table for the risk of gear loss

Potential Impact	Likelihood of occurrence				
	1	2	3	4	5
5	Handline	Trolling line			Drift longline
4			Set longline	aFAD	Set gillnet
3	Beach seine				Pot
2			Vertical LL		
1	Spear				

Note: Example for gear in normal fishing conditions for Grenada fishing gears.

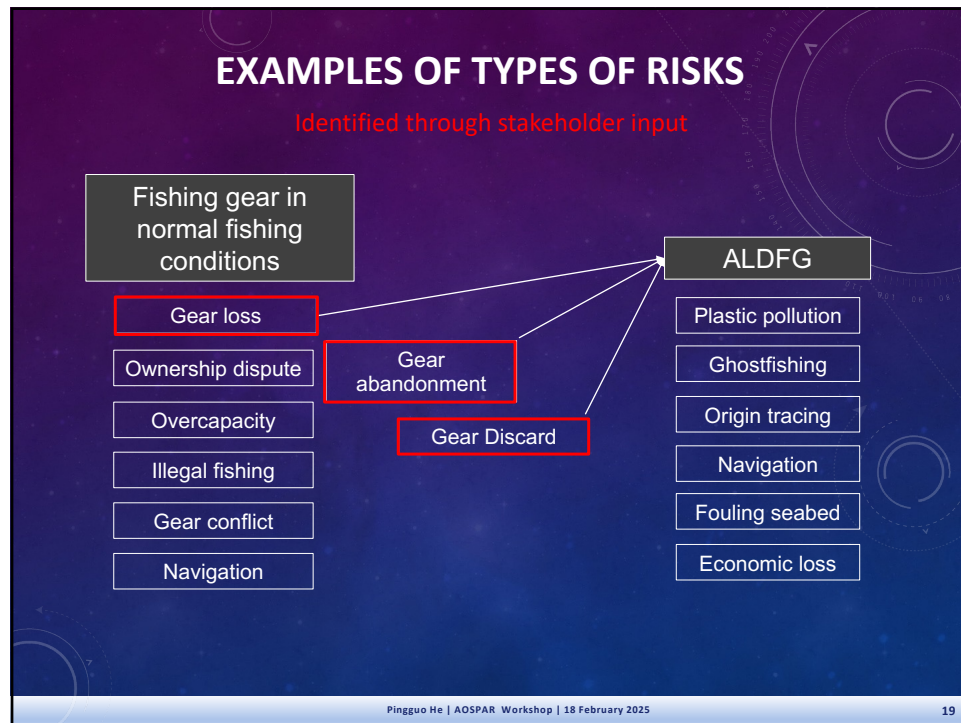
Colour shade:

Combined Risks

Table 9. Likelihood - impact table for combined risks when the gear is in normal fishing conditions.

Potential Impact	Likelihood of occurrence				
	1	2	3	4	5
5	Handline	Trolling line			Drift longline
4			Set longline	Gillnet, dFAD	Set gillnet
3	Beach seine				Pot
2			Vertical longline		
1	Spear				

18



19

LIKELIHOOD OF OCCURRENCE: ALDFG

GRENADA FISHING GEARS

Table 5. An example of scoring likelihood of occurrence of ALDFG risks

A	B	C	D	E	F	G	H	I
Gear type	ALDFG: Likelihood score (1–5)						Mean likelihood score	Rescaled mean likelihood score
	Plastic pollution	Ghost fishing	Traceability of ALDFG	Nav. hazard	Fouling seabed	Economic loss		
Beach seine	3	3	1	3	3	5	3.1	4
Set gillnet	3.2	5	3	3	5	4	3.9	5
Pot	1.2	5	2	2	4	4	3.1	4
Handline	2	1	1	1	2	2	1.6	2
Set longline	2.4	2	2	2	5	4	3.0	3
Drift longline	5	3	5	5	2	5	4.2	5
Vertical longline	1.2	2	5	5	2	3	3.1	4
Trolling line	2	1	2	1	3	2	1.9	2
Spear	0.2	1	1	1	1	1	1.0	1
aFAD	2.4	4	5	5	3	5	4.1	5

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20

POTENTIAL IMPACT: ALDFG GRENADA FISHING GEARS

Table 7. Example of impact scores for ALDFG risks

A	B	C	D	E	F	G	H	I
Gear type	ALDFG: impact score (1–5)						Mean impact score	Rescaled mean impact score
	Plastic pollution	Ghost fishing	Traceability of ALDFG	Nav. hazard	Fouling seabed	Economic loss		
Beach seine	2.1	2.9	2.2	2.5	2.3	2.7	2.4	3
Set gillnet	2.8	3.8	2.9	3.3	3.1	3.7	3.3	4
Pot	2.1	2.9	2.2	2.5	2.3	2.7	2.4	3
Handline	3.5	4.8	3.6	4.1	3.8	4.6	4.1	5
Set longline	2.8	3.8	2.9	3.3	3.1	3.7	3.3	4
Drift longline	3.5	4.8	3.6	4.1	3.8	4.6	4.1	5
Vertical longline	1.4	1.9	1.4	1.6	1.5	1.8	1.6	2
Trolling line	3.5	4.8	3.6	4.1	3.8	4.6	4.1	5
Spear	0.7	1.0	0.7	0.8	0.8	0.9	0.8	1
aFAD	2.8	3.8	2.9	3.3	3.1	3.7	3.3	4

Note: Impact scores for Grenada fishing gears considering stakeholder scores (from Table 6) and the gear's importance (from Table 1). Mean impact scores are rescaled to 1–5 (1 – lowest, 5 – highest)

21

EXAMPLE: RISK OF PLASTIC POLLUTION AFTER FISHING GEAR BECOME ALDFG

Potential Impact	5			Handline Trolling line		Drift longline
	4			Set longline aFAD	Gillnet	
	3			Beach seine		Pot
	2		Vertical longline			
	1	Spear				
		1	2	3	4	5
		Likelihood of occurrence				

22

EXAMPLE: COMBINED RISKS AFTER FISHING GEAR BECOME ALDFG

Table 12. Likelihood - impact table for combined risks when the gear became ALDFG.

Potential Impact	5	Handline, Trolling line			Drift longline
4			Set longline		Set gillnet, aFAD
3				Beach seine, Pot	
2				Vertical longline	
1	Spear				
	1	2	3	4	5
	Likelihood of occurrence				

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23

23

OVERALL RISKS: FISHING GEAR IN NORMAL FISHING CONDITION AND AFTER THEY HAVE BECOME ALDFG

Table 14. Likelihood-impact table for overall risks combining risks when the gear is in normal fishing conditions and when it becomes ALDFG

Potential Impact	5	Handline	Trolling line			Drift longline
4				Set longline	Set gillnet, aFAD	
3				Beach seine	Pot	
2					Vertical longline	
1	Spear					
	1	2	3	4	5	
	Likelihood of occurrence					

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24

24

COMPLEXITY AND PRIORITY FOR FISHING GEAR MARKING

High priority and comprehensive marking:

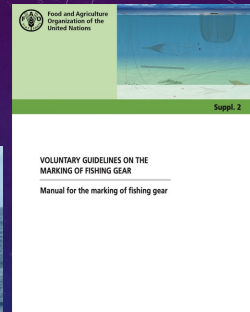
- Drift longline
- Set gillnet
- Set longline
- Pot
- Trolling line
- aFAD

Medium priority and complexity:

- Vertical longline
- Handline
- Beach seine

Minimal marking or exemption:

- Spear

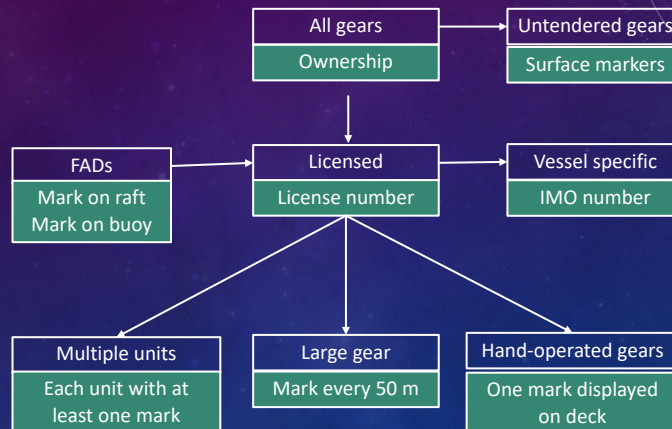


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25

25

RECOMMENDED MINIMUM REQUIREMENTS FOR THE MARKING OF FISHING GEAR



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26

26

THANK YOU



Pingguo He (phe@umassd.edu) is a professor of fisheries at the School for Marine Science and Technology of the University of Massachusetts Dartmouth in New Bedford, MA

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