

## **Title: Comparison of Tuna Harvest methods in Iran**

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### **Abstract**

Different harvest methods applied to catch tuna species in Iran. These methods are respectively ranked as below:

- Gill-net
- Long-line
- Purse-seine
- Trolling

Gill-net has a long history in tuna fisheries and has been used since local fishermen exploited dhows.

Despite all extension measures applied to modify fishing methods, about 93% of tuna is currently harvested by gillnet fisheries.

Long-line fisheries practically has been started about three years ago and has been gradually expanded with steady gillnet decline.

Purse-seine fisheries have been also established from almost 30 years ago and each recent year 5 vessels are active in this type of fisheries. Trolling has also used as a tuna fishing method by vessels with less than 3 Mt. during some seasons of year.

In current article, catch composition and Catch per unit effort (CPUE) of each method has been compared and with analyzing each method, technical and social considerations are assessed to predict development trends of every single tuna harvest method in Iran.

Key words: harvest methods, catch tuna, Iran

## - Introduction

Tuna harvested in Iran by different methods. Based on catch amount these methods are: Gill-net, long-line, purse-seine and trolling.

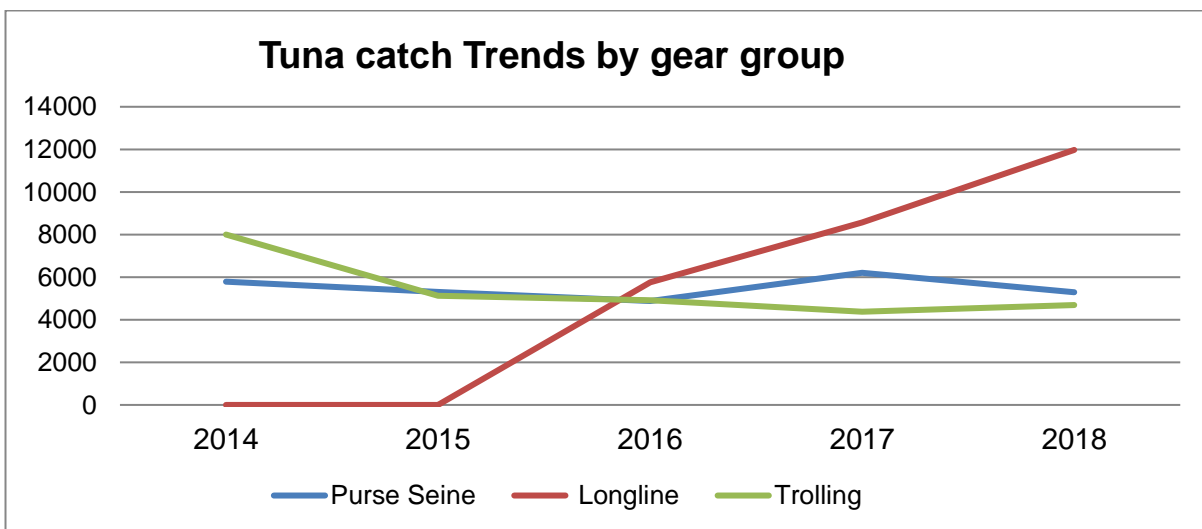
Gill-net has a long history as the time that Dhows are being used by local fishermen. Long-line method is almost seasonal and began from almost 3 years ago.

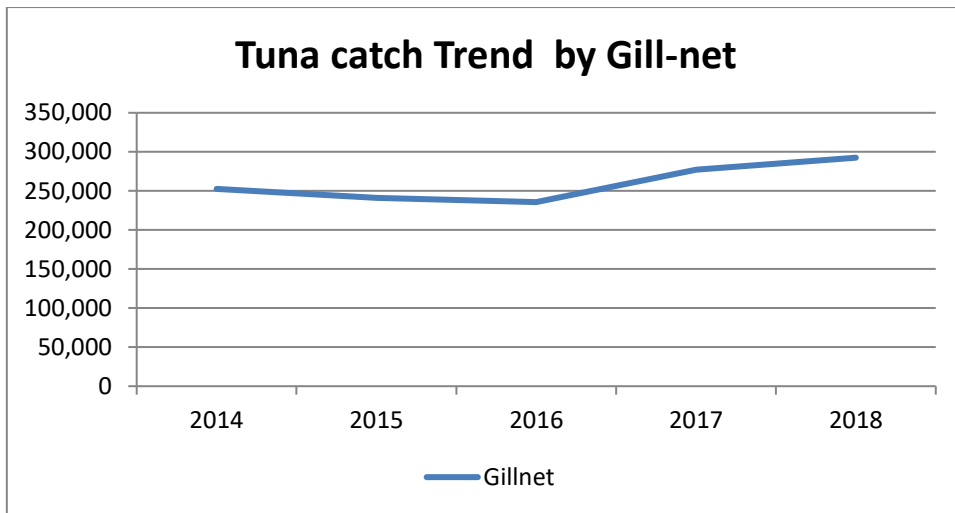
Tuna harvest by purse-seine method has been started almost 30 years ago and 3-8 vessels are annually using this method to catch tuna. Trolling also is used from many years ago for tuna harvest by fishing boat with  $3 > GT$  during some seasons

In current article some factors including catch composition, CPUE for each tuna fishing method reviewed and compared to other methods. Development trend of each method also predicted according to technical evaluations and social considerations

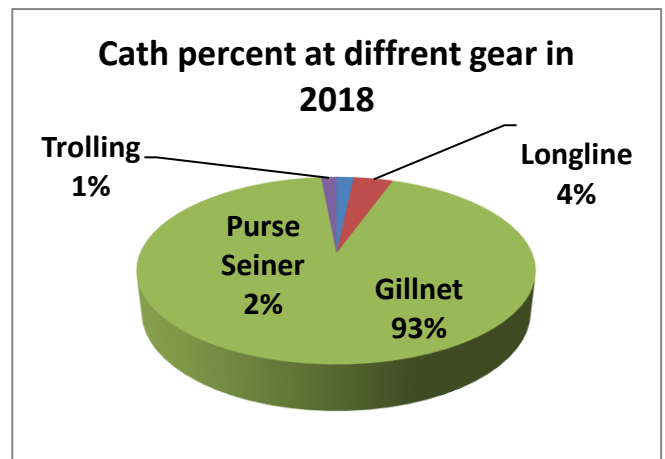
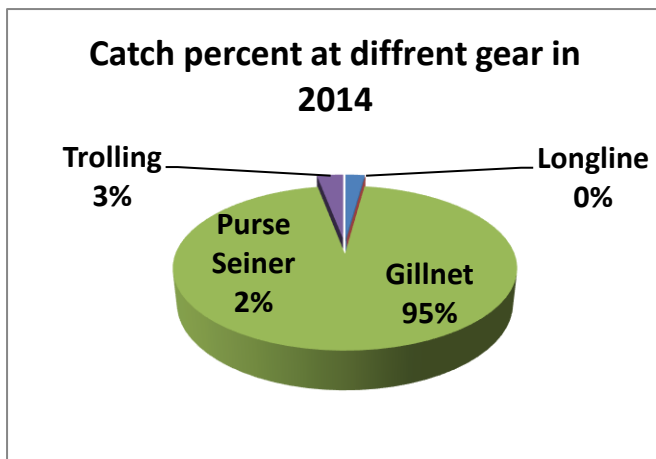
## - Catch trends by different methods

Study of tuna catch by different methods during last five years, reveals that tuna harvest by long-line method has been dramatically increased; however Tuna harvest by purse-seine and trolling faced slight fluctuations. Following graphs depict the tuna catch trend by various gears during last five years in Iran.





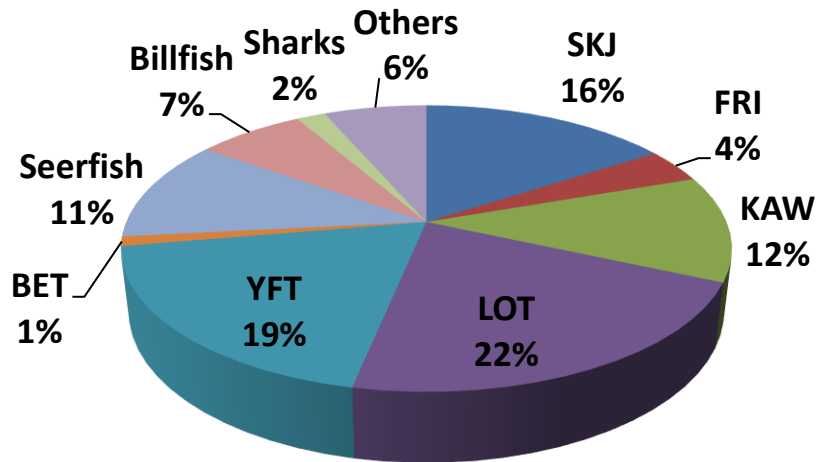
Long-line by gill-net vessels has been practically started from 2016, in some seasons (fall and winter). Comparison of catch amount also shows that tuna harvest by long-line method has been increased form zero percent to 4% during 5 last years. Gill-net on the other hand reduced from 95% to 93%, during same period.



**- Comparison of Catch composition by different methods**

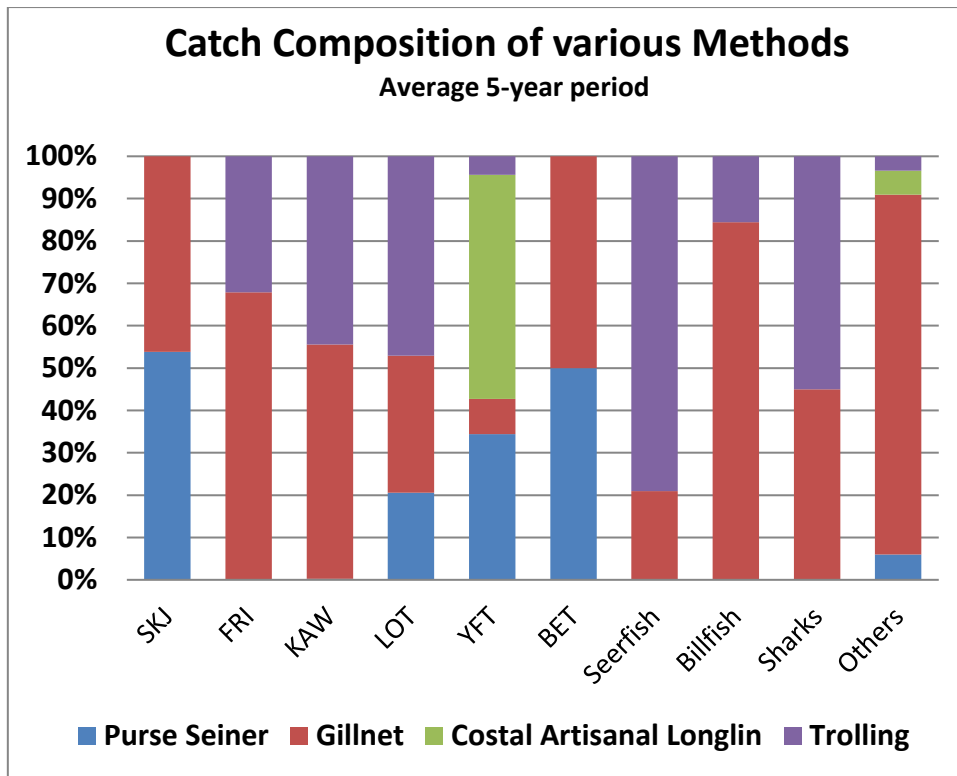
Study of average tuna catch during last five years showed that, average annual Long tail tuna Catch reached almost 6352 Mt. that forms 22% of total catch. Yellow fine, Skip Jack and Kawa Kawa Are 19%, 16% and 12%, respectively.

**Distribution(%) of Tuna and Tuna like species caught by various methods**



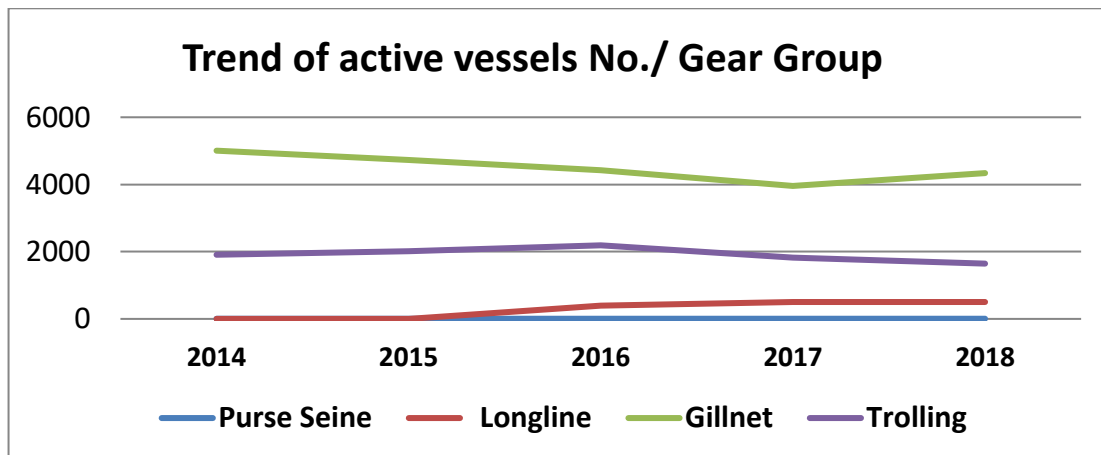
Catch composition of purse-seine vessels consists of SKJ, LOT, YFT and very rare amount of BET. The average amounts of these species are 19%, 14%, 65% and 2% respectively. Yellow-fine is the main specie in long-line catch composition while almost all tuna and Tuna like species are among catch composition of gill-net and trolling vessels.

Species	Average catch annually by each gear group				Total catch
	Purse Seiner	Gillnet	Costal Artisanal Long line	Trolling	
SKJ	1,064	43,110	0	0	44,174
FRI	0	10,662	0	105	10,767
KAW	3	32,961	0	552	33,517
LOT	779	57,817	0	1,757	60,352
YFT	3,560	40,494	8,729	448	53,230
BET	62	2,955	0	0	3,018
Seerfish	0	29,782	0	2,343	32,124
Billfish	0	18,948	0	73	19,021
Sharks	0	5,003	0	128	5,131
Others	27	18,086	41	15	18,169
Total	5,496	259,818	8,769	5,420	279,503

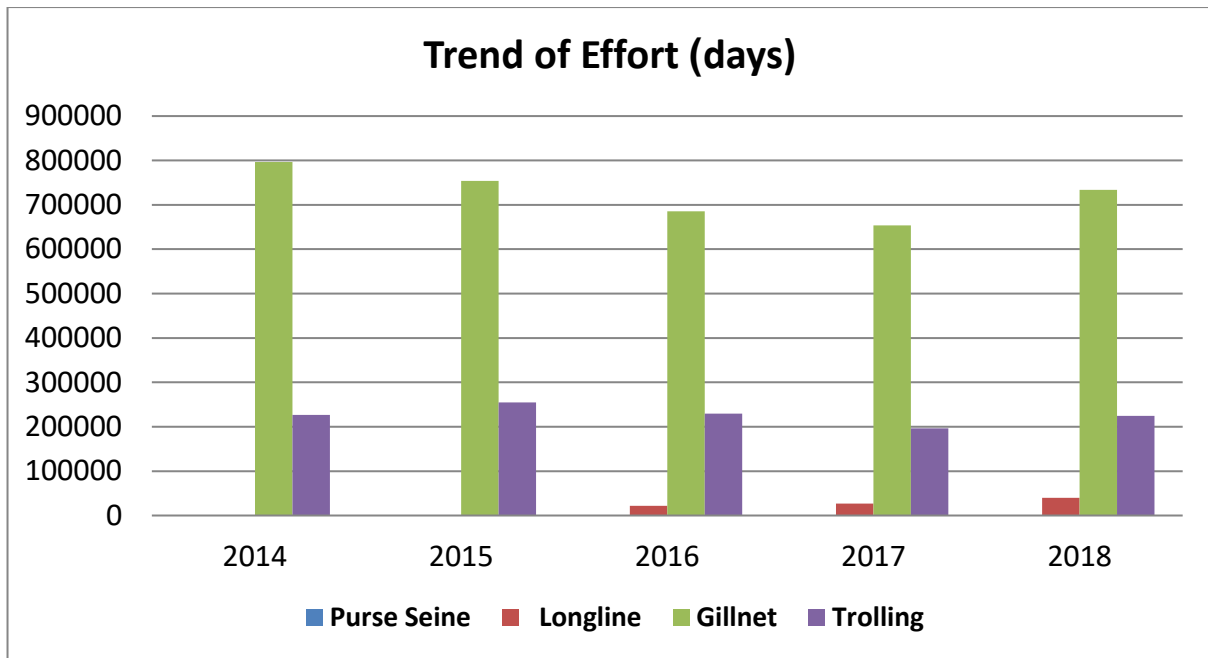


## - Fishing effort and CPUE

Studies show that the number of active gill-net vessels during last five years has been reduced and shifted to long-line method. Number of purse-seine and trolling vessels has remained constant while long-line vessels increased.

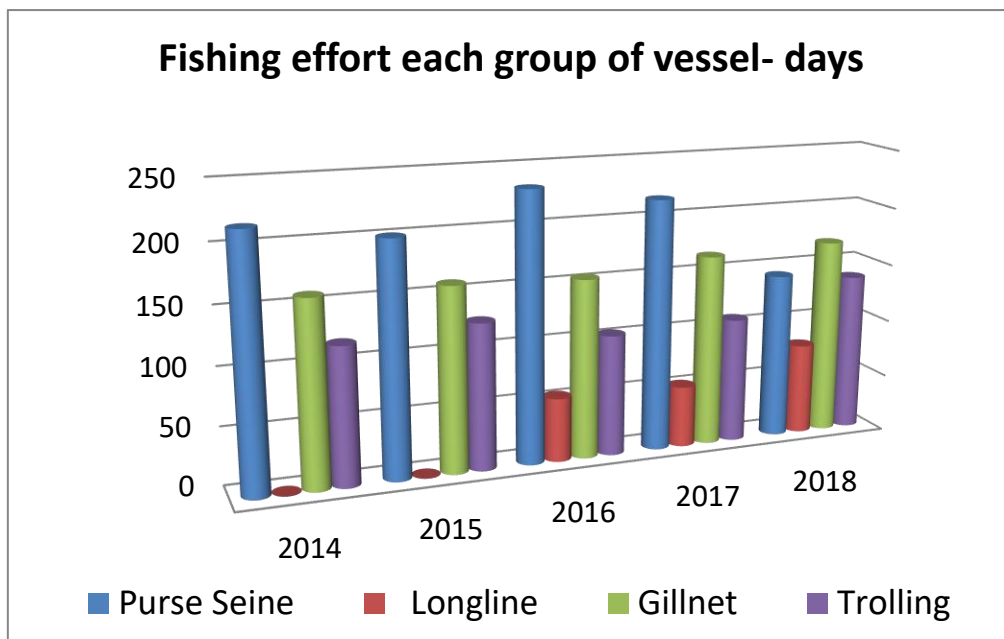


Following these changes, total fishing effort of each group, considering number of active vessels, has been changed; in a way that total effort of gill-net vessels has been reduced, however effort for trolling and purse-seine vessels remained almost constant and effort for long-line vessels increased.



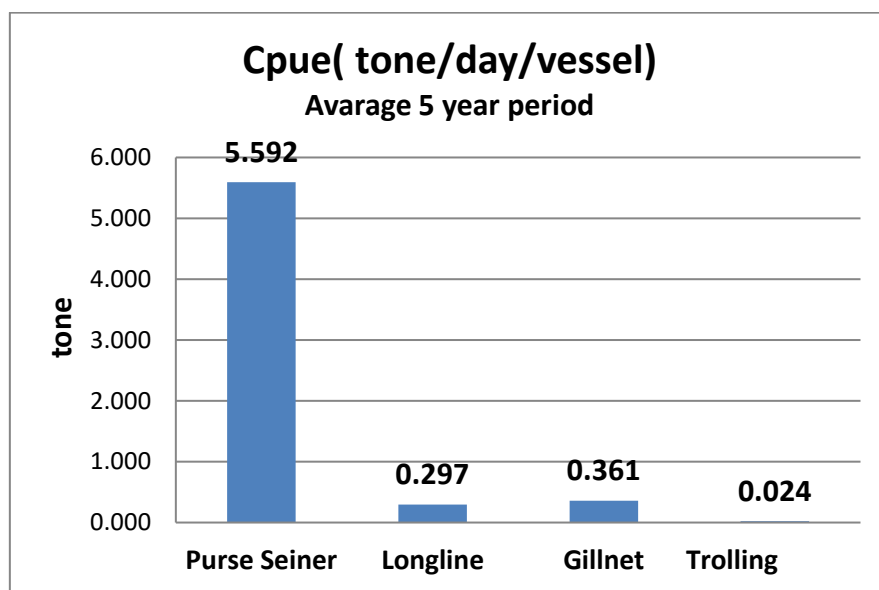
Study of effort for annual catch among each gear group shows that purse-seine vessels were active 201-233 days during 2014-2017. In 2018 annual active days reduced to 143 days. This reduction was due to impeding fishing licenses in Oman Sea and conflicts with local fishermen.

Gill-net and trolling vessels were active 155-163 days and 105-135 days respectively during 2014-2018. Long-line vessels active days have been raised from 55 days to 79 days in 2018; however these vessels use gill-net method during rest of year.



When CPUE is calculated by dividing total catch into active fishing days, we observe that CPUE has been almost constant during last five years and only in 2018 purse-seine vessels caught more efficiently. CPUE trends among various gear groups and average 5-year CPUE of different gears are shown in following table and graph.

gear group	cpue( tone/day/vessel)					Ave.cpue
	2014	2015	2016	2017	2018	
Purse Seiner	5	5	4	6	7	5/592
Logline	0/000	0/000	0/265	0/322	0/303	0/297
Gillnet	0/317	0/320	0/344	0/424	0/399	0/361
Trolling boat	0/035	0/020	0/021	0/022	0/021	0/024



## - Conclusion

- Extension measures such as long-line project by UNIDO assistance, training and extension classes for local fishermen, helped to shift slightly from gill-net to long-line method. Observations by fishermen and gill-net vessel owners from CPUE of long-line vessels encouraged them to change fishing method.
- One of the most significant requirements for fishing method modification is proper market prices of catch that could be obtained by world markets access. Currently there are some limitations and restrictions on this issue.
- Average annual catch per unit effort for purse-seine, gill-net, trolling and long-line vessels during 2014-2018 has been 202, 162, 118 and 62, respectively. It seems that the effort for purse-seiners is remarkably low.
- With Gill-net ban also will noticeably increase effort for vessels that seasonally harvest tuna by long-line method.