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Development of a scale to measure fishers' attitude towards responsible fishing

K. Rejula, [1*], V. K. Sajesh [1], Monalisha Devi Sukham[2], S. Ashaletha [1], Nikitagopal[1], A. K. Mohanty [1] and C. N. Ravishankar[1]

[1]ICAR-Central Institute of Fisheries Technology, Willingdon Island, Kochi-682 029, Kerala, India
[2]ICAR-Central Institute of Fisheries Education, Mumbai-400 061, Maharashtra, India

Abstract

The right to fish carries along with it an obligation to do fishing responsibly which is the fundamental principle of the FAO Code of Conduct for Responsible Fisheries (FAO-CCRF). There exist challenges in implementation of responsible fishing practices globally and hence appropriate communication, knowledge mobilisation and education across stakeholders are to be encouraged to achieve effective fisheries management systems. Understanding the attitude of fishers is important in achieving the goal of conservation and sustainable use of the oceans, seas and marine resources. Attitude act as the determinant of converting covert behaviour into overt action. It is rooted in motivation, which provides a meaningful background for individuals' overt behaviour. Perspective of fishers with respect to sustainable fishery systems is an important aspect to be studied in fishery governance. To measure this psychological construct, we need to use, standardised scales. There is no standardised scale available for measuring attitude of fishers towards responsible fishing. This paper discusses the development of Responsible Fishing Attitude (RFA) scale using Likert type scale development methodology. Conceptual dimensions of responsible fishing were delineated for attitude statement generation. The final Likert scale was having 13 statements with moderately high reliability and validity and can be administered to respondents on a 5-point continuum.

*Correspondence e-mail:
rejula.iari09@gmail.com

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Introduction

With an estimated production of 179 million t during 2018, fisheries sector provided employment to 59.51 million people globally (FAO, 2020a). Over the years, fisheries sector has undergone major developmental changes. Harvesting systems and fish detection methods have become more powerful and efficient. Ever-increasing demand for fish has fuelled an uncontrolled increase in fleet size. All these factors contributed towards an increasing pressure on world fishery resources (Boopendranath, 2019). Fish stock abundance and productivity is affected by increasing intensity of fishing activity, increase in overfished stock, climate change, pollution and habitat degradation (FAO 2020b). Many national and international efforts were initiated to overcome the global issue of unsustainable fishing. Pioneer effort for fishery conservation was made by FAO in 1995 by adopting a code of conduct for responsible fisheries known as FAO-CCRF (FAO, 1995). CCRF is voluntary in nature and it emphasises on precautionary approach, which needs to be followed in fisheries management in the absence of adequate scientific information. Sustainable development goal 14 (SDG 14) of the United Nations also urges for conservation and sustainable use of the oceans, seas and marine resources. The right to fish carries along with it an obligation to do fishing responsibly which is the underlying principle of FAO-CCRF. Even though progress has been achieved in fishery resource conservation efforts, there are enormous challenges in successfully implementing responsible fishing practices.

As per FAO (2020b) data, 34.32% of global fish stocks are overfished and the remaining 65.8% of fish stocks are harvested within biologically sustainable levels. There exist huge regional differences in the status of sustainable fisheries. Relatively ineffective fisheries management is considered to be one of the major reasons for declining fisheries sustainability in most part of Asia, and some parts of Central and South America as well as Africa (FAO, 2020b), which has multifarious impacts socially and economically, including plummeting export earnings at the country level. Social, economic and political dynamics are considered to be the most significant factors which threaten overall global environmental systems, particularly in small-scale artisanal fisheries (Intilli, 2012). Effective implementation of alternative mechanism of fisheries management systems requires appropriate communication, knowledge mobilisation and better education across the stakeholders that needs to be encouraged (FAO, 2020b).

Fishers are the major stakeholders to be focused in achieving the goal of conservation and sustainable use of oceans, seas and marine resources. Managing the behaviour of fishers is of prime importance in fisheries management (Ramachandran *et al.*, 2017). Influencing decision making process of fishers to comply with regulatory measures or to adopt appropriate technologies should be the key focus in fishery extension system. Such decision-making in fishing is influenced by the degree of positive or negative effect, which fishers associate with the concept of responsible fishing. Understanding fishermens' attitude towards different fishing practices is important to develop strategies for effective implementation of regulatory measures for responsible fishing. Attitude acts as the determinant factor behind converting covert behaviour into overt action. Attitude is rooted in motivation which provides a meaningful background for individuals' overt behaviour. Allport (1935) has defined attitude as a "mental and neural state of readiness, organised through experience, exerting a directive or dynamic influence upon the individual response to all objects with which it is related. With what perspective fishers are looking toward a sustainable fishery system is a researchable issue. In order to understand their perspective, we should be in a position to measure their attitude using standardised scales. Research on scale development in fishery has got limited attention and very few scales were developed to measure the attitude towards improved fish processing methods (Thiagarajan *et al.*, 1989; Anderson *et al.*, 2007). There is no standardised scale available for measuring attitude of fishers towards responsible fishing. In this context it is very relevant to study attitude of fishermen towards responsible fishing. This paper discusses about the new standardised scoring procedure developed by the authors to measure attitude of fishermen towards responsible fishing.

Materials and methods

Likert type scale development methodology was adopted in development of the responsible fishing attitude scale. Test conceptualisatio, construction, item analysis and revisions were the steps followed in scale construction process. Conceptual dimensions of responsible fishing were finalised through literature review and thematic analysis of stakeholder discussions and consultation with experts. Focus group discussions with traditional fishers, ring seine fishers and trawlers were done for the purpose. The concept of 'responsible fishing' was operationally defined and its sub-domains were delineated.

Steps followed in scale development

The first step in Likert scale construction was to define the content of the items to be included. Stakeholders in the marine capture fisheries sector belong to a heterogenous background using varied fishing craft and gear. It is very difficult to formulate attitude statements applicable to all sectors of capture fisheries. Therefore, based on the pilot study results, it was decided to develop a scale which measure the attitude of fishers who operate only trawler boats. The universe of item pool for the scale was developed based on 14 informal criteria suggested by Edwards (1969). A series of statements covering the entire range of responsible fishing, reflecting the opinion of the fishers about the importance of responsible fishing and their perception about the practice were prepared through the Focussed Group Discussions (FGDs) with different stakeholders. Statements that are factual or capable of being interpreted as factual were avoided. Statements with multiple interpretations and which were irrelevant to the topic were also excluded. Statements that were likely to be endorsed or not endorsed by almost everyone were also avoided.

The statements thus finalised were sent to an expert panel of judges with sufficient depth of knowledge in the field of fishing technology and fisheries social sciences, to determine the relevancy and for screening for inclusion in the final scale. Finally the selected statements were sent to identified resource persons comprising faculty from different universities/teaching organisations, scientists from ICAR research institutes, subject matter specialists from KVKs, field functionaries from various extension agencies having expertise in fishing techniques and fisheries extension, which was administered through a Google Form with a request to assess each statement and record their judgment on a five point continuum like Most Relevant (MR=5); Relevant (R=4); Somewhat Relevant (SWR=3); Less Relevant (LR=2); and Not Relevant (NR=1), against each attitude statement. Mean relevancy score (MRS), relevancy percentage and relevancy weightage were calculated for testing relevancy of each statement presented for expert judgment. A pilot survey was conducted in a non-sampling area and modifications were made in the attitude statements to avoid regional differences in the statement formation. The modified attitude statements were then administered to a sample of selected trawl owners and workers in order to calculate criterion group ('t' value) for each selected statement using the equation:

$$t = \frac{\bar{X}_H - \bar{X}_L}{\sqrt{\frac{\Sigma (X_H - \bar{X}_H)^2 + \Sigma (X_L - \bar{X}_L)^2}{n(n-1)}}}$$

where $\Sigma (X_H - \bar{X}_H)^2 = \Sigma X_H^2 - \frac{(\Sigma X_H)^2}{n}$

and $\Sigma (X_L - \bar{X}_L)^2 = \Sigma X_L^2 - \frac{(\Sigma X_L)^2}{n}$

Results and discussion

Attitude towards responsible fishing

Fishers' attitude towards responsible fishing was operationally defined as the degree of positive or negative effect, which they associate with scientifically informed and regulated fishing practices which contributes towards conserving fishery resources for the future generation while earning a livelihood out of it. Thematic analysis of discussions with experts in the field of fishery social sciences and fishing technology revealed that fishers' attitude towards responsible fishing is influenced by both personal and external factors. Synthesis of literature and expert discussion revealed that conservation orientation, compliance to rules and regulations, willingness to adopt resource saving technologies/responsible fishing practices, willingness to participate in co-governance, experience with regard to negative impact of fishing and willingness to participate in training and awareness campaign, influence responsible fishing behaviour. Institutional roles, capture fisheries regulatory framework in terms of access control, temporal control, spatial control, input/effort-based, output/catch based and legislation/s in force are found to be other factors influencing responsible fishing behaviour.

Conceptual dimensions of responsible fishing

Based on the pilot study results, it was decided to develop a scale which measures attitude of fishers who operate trawler boats. Conceptual dimensions of responsible fishing for attitude statement generation were delineated based on FAO Code of Conduct for Responsible Fisheries and The Kerala Marine Fisheries Regulation Act, 1980. The identified 11 conceptual dimensions were taken into consideration for developing a scientific scale to study the attitude of fishers towards responsible fishing techniques (Table 1).

Generation of attitude statements

As per the above conceptual dimensions, a total of 200 statements were developed with equal number of positive and negative statements and with proper representation of affective, behavioural, and cognitive components of attitude. Out of the 200 statements, 90 were selected based on Edwards's criteria (Edwards,1969).

Data collection on judges rating of attitude statements

The selected 90 statements were subjected to judgement from 50 experts in the relevant fields on a five-point continuum ranging from Most Relevant (MR=5) to Not Relevant (NR=1). A Google form application was used for the survey and out of 50 experts, 22 experts responded in a time period of one month. Mean relevancy score (MRS), relevancy percentage and relevancy weightage were calculated for testing relevancy of each statement presented for expert judgment. Mean relevancy score was obtained by dividing total relevancy score by number of judges. Relevancy weightage was obtained by dividing total relevancy score by maximum possible scores for each item. Relevancy percentage was worked out by summing up the scores of most relevant, relevant and somewhat relevant categories, which were converted into percentage. The statements having mean relevancy score (MRS) > 3.89, relevancy weightage (RW) > 0.78 and relevancy % (RP) >88.57, were considered for final selection of statements. Also, some of the statements

Table1. Conceptual dimensions of responsible fishing

Sl. No.	Conceptual dimensions of responsible fishing	No. of statements framed initially	No. of statements after judges' rating
1	Regulations on fishing gear	6	2
2	Regulations on fishing craft	3	2
3	Regulations for energy optimisation	8	4
4	Promotion of resource saving technologies	18	8
5	Minimum legal size of fish	9	6
6	Seasonal trawl ban	3	2
7	Control over destructive fishing practices	3	0
8	Ghost fishing effects of lost or abandoned fishing gear	4	2
9	Regulations for safety of human life at sea	10	7
10	Co-management of fishery resources	8	4
11	Conservation orientation	18	6

were pointed out by the experts as redundant and were eliminated. By this process, out of total ninety statements 47 statements were discarded and finally 43 statements remained for further analysis (Table 2).

Table 2. Attitude statements selected after Relevancy Test

No.	Statements	MRS	RW	RP
1	Mesh size regulation is desirable for conserving fishery resources	4.54	0.91	98.17
2	*Govt should not regulate the mesh size of gear used by fishers	4.33	0.87	100.00
3	Adding new vessels into fishery system is not a healthy sign	4.92	0.98	100.00
4	*Moratorium on new fishing crafts is a threat to fishers	4.33	0.87	100.00
5	Regulating the engine horse power in trawlers is desirable for responsible fishery	4.63	0.93	100.00
6	Operation of engines beyond the recommended horse power will only increase cost of operation	4.67	0.93	100.00
7	*When others increase the size of their fishing system, it is better to follow it.	3.89	0.78	94.29
8	*Fishers have no other way but to use high horse power engine to compete with others	4.11	0.82	94.59
9	Fishers must adopt recommended technologies for resource conservation	4.79	0.96	100.00
10	*Resource saving technologies will cause economic loss to fishers	4.11	0.82	97.30
11	Trawling is not an eco-friendly method of fishing	4.71	0.94	98.23
12	I am ready to modify my trawl system if a gear with low impact on bottom is available	4.54	0.91	99.08
13	*Use of Bycatch Reduction Devices will increase fuel consumption in fishing operation	4.11	0.82	94.59
14	*Bycatch Reduction Devices should be kept in vessels for the sake of inspection	4.00	0.80	94.44
15	Catching juveniles and later throwing it out is not a good practice	4.63	0.93	99.10
16	Codends of all trawl nets should be made of square mesh	4.75	0.95	100.00
17	Square mesh panels have to be used for reducing the bycatch	4.54	0.91	100.00
18	Landing of juvenile fish must be banned in all maritime states of the country	4.79	0.96	100.00
19	Trade of juvenile fish should be prohibited	4.71	0.94	98.23
20	*The recommendation on the minimum legal mesh size of gears is practically not feasible	4.44	0.89	95.00
21	*I think catch of juveniles can never be reduced	4.11	0.82	91.89
22	*Trade of juvenile fish need to be promoted	4.22	0.84	97.37
23	Seasonal trawl ban is desirable for conserving fishery resources	4.88	0.98	100.00
24	*Seasonal trawl ban duration should be reduced	4.11	0.82	89.19
25	Throwing of broken fishing gear into the sea is not a good practice	4.75	0.95	98.25
26	*Discarded fishing gears cannot do any harm to the fish in the sea	4.11	0.82	97.30
27	Safety of Fisher at sea is of great concern for me	4.83	0.97	98.28
28	Life jackets and buoys are to be kept in fishing vessel compulsorily	4.92	0.98	100.00
29	Installation of vessel monitoring system (VMS) in the fishing vessel is of great use for the safety of fisher	4.75	0.95	100.00
30	*Procedures for safety at sea need to be followed only during unfavorable weather conditions	4.44	0.89	95.00
31	Fishers must use navigation lights in fishing vessel to avoid collision at sea	4.88	0.98	100.00
32	Fishers should involve actively in fishery conservation activities	4.58	0.92	98.18
33	Trawlers should avoid doing fishing in the fishing zones allotted for artisanal fishers	4.58	0.92	99.09
34	*Traditional fisheries management systems have no relevance nowadays	4.33	0.87	94.87
35	*Fisheries management council is a good initiative, but I think it is never going to achieve its objective	4.22	0.84	100.00
36	Whatever be the effort required, implementing rules for fishery conservation is necessary	4.67	0.93	100.00
37	*Attaching square mesh codend to trawl net is practically not feasible	4.11	0.82	97.30
38	The declining fish catch is an after effect of uncontrolled fishing	4.58	0.92	98.18
39	I have an obligation to do fishing responsibly	4.63	0.93	98.20
40	*Fishery resources are not so badly depleted requiring very strict enforcement of rules	4.11	0.82	89.19
41	*Frequent inspection of catch by department officials will only create disturbances to the fishers	4.22	0.84	94.74
42	*There is nothing to worry about decline in fish catch	3.89	0.78	91.43
43	*Scientific fishery management is required only when the resource supply is severely hampered	3.89	0.78	88.57

Analysis of statements with respect to criterion group (t value) and final selection of attitude statements

A pilot survey was conducted to analyse the relevance of 43 attitude statements selected through expert judgment. Survey was conducted at Sasson Dock and Versova in Mumbai, Maharashtra. Modifications were made in the attitude statements to avoid regional differences in the statement formation based on the survey results. The modified 43 attitude statements selected based on judges rating was then administered to selected respondents operating trawlers in Ernakulam and Kozhikode districts of Kerala, through telephonic interview method which was necessitated due to the Covid 19 pandemic. The data was analysed to calculate criterion group (t value) for each selected statement (Table 3).

Table 3. Attitude statements (t value)

Item No.	Sl. No.	Statements	t value
43	1	*Scientific fishery management is required only when the resource supply is severely hampered	3.48
39	2	I have an obligation to do fishing responsibly	3.25
7	3	*When others increase the size of their fishing system, it is better to follow it.	3.13
29	4	Installation of vessel monitoring system (VMS) in the fishing vessel is of great use for the safety of fisher	3.00
35	5	*Fisheries management council is a good initiative, but I think it is never going to achieve its objective	3.00
22	6	*Trade of juvenile fish need to be promoted	2.63
38	7	The declining fish catch is an after effect of uncontrolled fishing	2.55
30	8	*Procedures for safety at sea need to be followed only during unfavourable weather conditions	2.50
27	9	Safety of fisher at sea is of great concern for me	2.33
34	10	*Traditional fisheries management systems have no relevance nowadays	2.18
2	11	*Govt should not regulate the mesh size of gear used by fishers	2.04
18	12	Landing of Juvenile fish must be banned in all maritime states of the country	1.99
21	13	*I think catch of juveniles can never be reduced	1.90
8	14	*Fishers have no other way but to use high horse power engine to compete with others	1.73
25	15	Throwing of broken fishing gear into the sea is not a good practice	1.73
1	16	Mesh size regulation is desirable for conserving fishery resources	1.67
31	17	Fishers must use navigation lights in fishing vessel to avoid collision at sea	1.48
3	18	Adding new vessels into fishery system is not a healthy sign	1.48
4	19	*Moratorium on new fishing crafts is a threat to fishers	1.48
24	20	*Seasonal trawl ban duration should be reduced	1.39
28	21	Life jackets and buoys are to be kept in fishing vessel compulsorily	1.39
26	22	*Discarded fishing gears cannot do any harm to the fish in the sea	1.26
9	23	Fishers must adopt recommended technologies for resource conservation	1.22
6	24	Operation of engines beyond the recommended horse power will only increase cost of operation	1.17
23	25	Seasonal trawl ban is desirable for conserving fishery resources	1.02
5	26	Regulating the engine horse power in trawlers is desirable for responsible fishery	1.00
13	27	*Use of Bycatch Reduction Devices will increase fuel consumption in fishing operation	1.00
33	28	Trawlers should avoid doing fishing in the fishing zones allotted for artisanal fishers	1.00

Item No.	Sl. No.	Statements	t value
40	29	*Fishery resources are not so badly depleted requiring very strict enforcement of rules	1.00
12	30	I am ready to modify my trawl system if a gear with low impact on bottom is available	0.94
36	31	Whatever be the effort required, implementing rules for fishery conservation is necessary	0.93
42	32	*There is nothing to worry about decline in fish catch	0.93
37	33	*Attaching square mesh codend to trawl net is practically not feasible	0.83
14	34	Bycatch Reduction Devices should be kept in vessels for the sake of inspection	0.65
10	35	*Resource saving technologies will cause economic loss to fishers	0.48
20	36	*The recommendation on the minimum legal mesh size of gears is practically not feasible	0.40
19	37	Trade of juvenile fish should be prohibited	0.39
17	38	Square mesh panels have to be used for reducing the bycatch	0.26
41	39	*Frequent inspection of catch by department officials will only create disturbances to the fishers	0.26
16	40	Codends of all trawl nets should be made of square mesh	0.20
15	41	Catching juveniles and later throwing it out is not a good practice	0.00
11	42	Trawling is not an eco-friendly method of fishing	-0.31
32	43	Fishers should involve actively in fishery conservation activities	

Statements with t value greater than or equal to the mean value (t=1.75) was considered for selecting final items to the scale. At the same time, a few statements were not selected to the final scale even if they got a better t value based on expert opinion and also due to poor generalisability of statements. In case of negative statements (statements requiring reverse scoring while administering the scale) seven items were selected with a t value higher than 1.75. Whereas in case of positive statements, four items with t value lower than mean value were selected in order to have a balance mix of statements in the final scale (Table 4).

Table 4. Final selected attitude statements based on t value

Sl. No.	Item No.	Statements	t value
1	43	*Scientific fishery management is required only when the resource supply is severely hampered	3.48
2	39	I have an obligation to do fishing responsibly	3.25
3	7	*When others increase the size of their fishing system, it is better to follow	3.13
4	38	Uncontrolled fishing can cause catch decline	2.55
5	22	*Trade of juvenile fish need to be promoted	2.63
6		Safety of fisher at sea is of great concern for me	2.33
7	30	*Procedures for safety at sea need to be followed during unfavourable weather conditions	2.50
8	18	Landing of Juvenile fish must be banned in all maritime states of the country	1.99
9	25	Throwing of broken fishing gear into the sea is not a good practice	1.73
10	2	*Govt. should not regulate the mesh size of gear used by fishers	2.04
11	1	Mesh size regulation is desirable for conserving fishery resources	1.67
12	21	*I think catch of juveniles can never be reduced	1.90
13	3	Adding new vessels into fishery system is not a healthy sign	1.48

*Indicate negative statements requiring reverse scoring

Testing reliability and validity of the scale

Reliability of a test represents the stability and consistency of test score upon administration to the same group of respondents during different time intervals. It is expressed as reliability coefficient and its numerical value ranges between 0 and 1. There are various methods used to compute reliability coefficient. In this study, Internal-consistency method by Cronbach was used to test the reliability of the scale developed (Cronbach, 1951). Cronbach's alpha is a function of the number of test items and the average inter-correlation among the items. The new scale developed was administered to 20 respondents (from non-sampling area) and the score was analysed using SPSS. Cronbach alpha value was calculated as 0.809 which indicates a moderately high reliability of the test score (Table 5).

Table 5. Reliability statistics of the scale

Reliability Statistics		
Cronbach's alpha	**Cronbach's Alpha based on standardised items**	**No. of items**
0.809	0.808	13

Validity is an indication of whether the scale is measuring what it intends to measure. In this study, content validity was used for testing validity of scale. This is a method of validity by assumption with a criterion of how best the content of the scale matches with the subject matter under study. The project team consisting of fishery social scientists and fishing technology scientists tested the content validity of the scale in consultation with subject specialists and by reviewing the pertinent literature. The final scale has items under the identified conceptual dimensions of responsible fishing such as; regulation on fishing gear, craft, energy optimisation, ghost fishing effects of lost or abandoned fishing gear, safety of human life at sea, co-management of fishery resources and conservation orientation, in terms of questions under themes such as, scientific fishery management, compliance to legislation, size of fish harvesting systems, juvenile fish catch, safety at sea, mesh size regulation, engine power (energy efficient fishing systems) asn ghost fishing. Therefore, it was concluded that the new scale will be a valid test for measuring attitude of fishers towards responsible fishing as it has representative content under conceptual dimensions of responsible fishing behaviour.

The concept of responsible fishing is a deeply researched and widely discussed subject in fisheries science. The subject has many dimensions and has many approaches. At the fishers' level, difference in perception is observed between stakeholders and within different sectors of fishery. Due to this, it was difficult to set boundaries for selecting conceptual dimensions of responsible fishing for test conceptualisation. The methodology followed in Likert scale development has helped in developing a reliable and valid scale to measure attitude of fishers towards responsible fishing. A total of 13 statements (having 7 positive and 6 negative statements) are present in the final attitude scale. The final RFA scale can be administered to respondents on a 5-point continuum. The respondents can be categorised into groups based on attitude and by further analysis Knowledge-Attitude-Practice (KAP) gap can be identified among fishers in the sector. Thereafter, specific interventions can be planned and implemented based on KAP gap. The attitude scale developed can be used by future researchers with suitable modifications within the sector and can also be modified and used for non-fisher stakeholders in the fisheries sector.

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References

Allport, G. A. 1935. *Handbook of social psychology*, Clark University Press, Worcester, Massachusetts, USA, 810 p.

Anderson, D. K., Ditton, R. B. and Hunt, K. M., 2007. Measuring angler attitudes toward catch-related aspects of fishing. *Human Dimensions of Wildlife*, 12 (3): 181-191.

Boopendranath, M. R. 2019. *FAO Code of conduct for responsible fisheries; Fishing operations*. In: Edwin, L., Saly, N. T., Remesan, M. P., Ashraf, P., Baiju, M. V., Lakshmi, M. N. and Madhu, V. R. (Eds.), *Responsible fishing: Recent advances in resource and energy conservation*, November 2019. ICAR-Central Institute of Fisheries Technology, Kochi, India, pp. 41-54.

Cronbach, L. J. 1951.Coefficient alpha and the internal structure of tests. *Psychometrika*. 16: 297-334.

Edwards, A. L. 1969. *Techniques of attitude scale construction*. Vakils, Feffer and Simons Pvt. Ltd., New York, USA.

FAO 1995. *Code of conduct for responsible fisheries*. Food and Agriculture Organisation of the United Nations, Rome, Italy.

FAO 2020a. *The state of world fisheries and aquaculture 2020-Sustainability in action*. Food and Agriculture Organisation of the United Nations, Rome, Italy. https://doi.org/10.4060/ca9229en.

FAO 2020b. Proceedings of the international Symposium on Fisheries sustainability: Strengthening the science-policy nexus. *FAO Fisheries and Aquaculture Proceedings No. 65*. 18-21 November 2019. Food and Agriculture Organisation of the United Nations, Rome, Italy. https://doi.org/10.4060/ca9165en.

Intilli, J. S. 2012. *Fishery management (fish, fishing and fisheries)*. Nova Science Publishaers, New York, USA.

Ramachandran, C., Vipinkumar, V. P. and Shinoj P. 2017. *Responsible fisheries-A prelude to the concept, context and praxis. Working Paper*. ICAR-Central Marine Fisheries Reaearch Institute, Kochi, India. https://doi.org/10.13140/RG.2.2.30000.87044

Thiagarajan, R., Mohan, B., and Kandoran, M. K., 1989. A scale to measure the attitude towards improved fish processing methods. *Fishery Technol*., 26: 19986.