

Joint FAO/ILO/IMO Ad Hoc Working Group on
Illegal, Unreported and Unregulated Fishing
and Related Matters
5th session

JWG 5/INF.9

**SAFETY AND WORKING CONDITIONS IN THE FISHERIES SECTOR AND
PROTECTION OF THE MARINE ENVIRONMENT**

**INTERAGENCY COOPERATION TO PROMOTE AND IMPLEMENT
INTERNATIONALLY-AGREED MEASURES TO COMBAT
IUU FISHING AND RELATED MATTERS**

**Collection of fisher safety data and accident
and mortality information**

Submitted by the FAO and IMO Secretariats

SUMMARY

Executive summary: The FAO Committee of Fisheries (COFI 35) at its 35th session in 2022 “requested FAO to take a lead on the establishment of a repository for fisher safety data and accident and mortality information”. The IMO Maritime Safety Committee at its 107th session in June 2023 noted that a relevant scoping document with recommendations for future steps would be presented at the next meeting of the FAO/ILO/IMO Ad Hoc Joint Working Group on IUU fishing and related matters. In this context, FAO commissioned an international consultant to prepare a scoping document to be made available as an information document at the fifth Joint Work Group on Illegal, Unregulated and Unreported fishing (IUU fishing).¹

Introduction

1. Of all seafarers, fishers and fishworkers are probably those who suffer the worst working conditions (Nunez-Sanchez et al. 2020).² Fishing is considered one of the most dangerous occupations in the world with a large occurrence of adverse outcomes (e.g. incidents, accidents, and casualties) intimately linked to safety. However, fishing has been defined as a domestic and/or regional issue depending on the specific fisheries (rather than a global issue) and the response to the need to develop capacity, to gather data and to investigate accidents has varied from country to country (IMO, 2023).³

2. Attempts to have a global picture of accidents in the fishing sector were never handled at international level with success. On the one side the particularities of the

¹ The views expressed in this information document are those of the author and do not necessarily reflect the views or policies of FAO and IMO.

² Núñez-Sánchez M.J, Pérez-Rojas L, Sciberras L Ramos Silva J, (2020) Grounds for a safety level approach in the development of long-lasting regulations based on costs to reduce fatalities for sustaining industrial fishing vessel fleets. Mar Policy 113. <https://doi.org/10.1016/j.marpol.2019.103806>

³ IMO “Development of guidance to assist competent authorities in the implementation of the Cape Town Agreement of 2012” III 9/WP 7. 2023 (Section 7 drafted by the author of this report)

sector make difficult an intervention at international level. On the other side the sector is socially complex.

3. In particular, small scale fisheries comprising subsistence fishing, are difficult to regulate, particularly in developing countries. When that has been made it has mainly been done with the aim to control and regulate the catches. This may have created aversion to be further controlled and therefore to report data. However, there are examples good data repositories at national and regional levels.

4. This information document has been drafted with the aim to get an overall picture of fishing vessel accidents regulations and data collection systems with the intention to overcome the current limitations in accident data reporting without leaving small scale fisheries behind.

5. This document does not analyse the causes of fishing vessels accidents and how to reduce them. It explores areas of cooperation among the most relevant UN international organizations dealing with the matter, to be able to determine the number of fatalities, improve safety at sea; and reduce labour accidents.

6. The document contains four parts to:

- Review existing instruments and requirements and their applications on reporting of casualties and incidents of fishing vessels of FAO/IMO/ILO;
- Explore the areas of cooperation among FAO/IMO/ILO and other agencies in establishing a database;
- Review database components such as data security, longevity, levels of formality, consistency in data, transparency, harnessing data, costs, oversight in managing databases, managing priorities in a database; and
- Put forward recommendations as appropriate in connection with establishing such a database for discussion at the FAO/ILO/IMO joint working group.

7. The aim of this document is to explore the possibility to establish a global repository dealing with fisher safety, accidents and mortality data that can be used at national and international level to improve safety and occupational health looking both at small scale and large scale fisheries.

8. The report contributes to achieve target 8.8. refers of the Sustainable Development Goals (SDGs) which relates to “the protection of labour rights and the promotion of safe and secure working environments for all workers” such as fishers and fishworkers.

Review existing international FAO/IMO/ILO instruments and requirements on accident and fatality reporting systems

9. This section describes the main conventions and other work by the United Nations (UN) Agencies dealing with fisheries, maritime safety and maritime labour in particular the Food and Agriculture Organization of the United Nations (FAO), the International Maritime Organization (IMO) and International Labour Organization (ILO), in chronological order and with a focus on accident and reporting system.

10. The United Nations Convention on the Law of the Sea (UNCLOS) entered into force in November 1994. Under UNCLOS, article 94 on Duties of the flag State, paragraph 7, provides that “Each State shall cause *an inquiry to be held by or before a suitably qualified person or persons into every marine casualty or incident of navigation on the high seas involving a ship flying its flag and causing loss of life or serious injury to nationals of another State or serious damage to ships or installations of another State or to the marine environment. The flag State and the other State shall co-operate in the conduct of any inquiry held by that other State into any such marine casualty or incident of navigation.*”. The article does not go further than this and only deals with the high seas. The article implies that other accidents and incidents are/will be investigated at national level and leaves this issue up to secondary legislation.

11. The tripartite Meeting on Safety and Health in the Fishing Industry, held in Geneva in 1994 (ILO, 1999), notes that the International Maritime Organization (IMO) Secretariat compiles casualty data concerning fishing vessels (FVs) and fishers at sea⁵. In the report prepared for that meeting, it is also indicated that “*The E.U based Study and Action Committee for Safety in Sea Fisheries*”, was working at that time towards the establishment of a central database to collect relevant information from each country.

12. The International Labour Organization (ILO) hosts several databases on occupational mortality (ILO, 2023)⁶. However, these data do not specifically address fatalities in the fisheries sector and when this data is used (M. Nunez et al, 2021)⁷ the fatalities are low, which indicates underreporting.

13. “*The Work in Fishing Convention, 2007 (No. 188): Getting on board*” (ILO, 2013)⁸ argues that the implementation of the Convention No. 188 would lead to the reduction of occupational accidents and associated costs. It contains an interesting section explaining how the worldwide fatality rate was calculated in the 1990s and provides an extra source of data for countries where the fatality rate in fishing is several times the index of all sector combined.

14. Labour accidents, reporting and investigation are addressed in articles 31 to 33 of the ILO 188 Work in Fishing Convention of 2007, which entered into force in November 2017 (ILO, 2007)⁹. This Convention applies to all fishing vessels engaged in commercial fishing, except those fishers engaged in subsistence fishers, with additional provisions applicable to fishing vessels (FVs) from 24 m in length, such as the need to adopt regulations, measures and guidance to prevent accidents by its Parties. In accordance

⁴ ILO Safety and health in the fishing industry. “Report for discussion at the Tripartite Meeting on Safety and Health in the Fishing Industry” Geneva, 1999. ISBN92-2-111829-0, 1999.

⁵ IMO, FSI 7/6/2, 29 Jan 1999.

⁶ ILO World Statistics. https://www.ilo.org/moscow/areas-of-work/occupational-safety-and-health/WCMS_249278/lang--en/index.htm [Last consulted August 2023].

⁷ Núñez-Sánchez, M, Dalen, D., Pérez-Rojas, L. “A quantitative data analysis in relation to size, scope and behavioural patterns for the implementation of a port state control regime of the global industrial fishing vessel fleet” WMU Journal of Maritime Affairs Volume: 20 <https://doi.org/10.1007/s13437-021-00251-1>.

⁸ ILO “The Work in Fishing Convention, 2007 (No. 188): Getting on board, Issues paper for discussion at the Global Dialogue Forum for the promotion of the Work in Fishing Convention, 2007 (No. 188), 2013. ISBN 978-92-2-127080-5 (print) ISBN 978-92-2-127081-2.

⁹ ILO Labour Standards C188 - Work in Fishing Convention, 2007 (No. 188) https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:12100:0::NO::P12100_ILO_CODE:C188.

with article 33 a risk evaluation is to be conducted as appropriate with the participation of fishers. However, article 33 does not say that data are needed.

15. With regards to compliance and enforcement the ILO 188 Work in Fishing Convention requires the establishment of a system for ensuring compliance with means of monitoring. In relation to monitoring, accountability, data are not required by the Convention. However ILO considers that data gathering is important and has developed a "*Code of Practice for the Recording and notification of occupational accidents¹⁰ and diseases*".¹¹ The Code indicates that when working on accidents a special focus is needed on the collection, recording and notification of data concerning occupational accidents and diseases, which is instrumental in preventing them. The attribution of the responsibility for the accident should not be the main concern and it is recommended to have a national policy to implement this. Furthermore, the "*Quick Guides on sources and uses of statistics on occupational safety and health*"¹² (ILO, 2020) contains some recommendations related to compilation and classification of accidents. In the guidelines it is clearly indicated that there is a problem with data comparability across countries.

16. The efforts towards accident investigation in the International Maritime Organization (IMO) are consolidated for merchant ships. Under SOLAS regulation I/21 and MARPOL articles 8 and 12, each flag Administration undertakes to conduct an investigation into any casualty occurring to ships entitled to fly its flag subject to those conventions and to supply the Organization with pertinent information concerning the findings of such investigations. A similar requirement can also be found in the provision of the Cape Town Agreement of 2012 (CTA 2012), regarding the investigation of casualties to fishing vessels. SOLAS does not apply to FVs, except for some provisions in SOLAS chapter V (Safety of Navigation), when so decided, and SOLAS XIV (Polar Code). It should be noted that MARPOL is applicable to FVs. The 1966 Load Lines Convention, not applicable to FVs, contains a similar article.

17. IMO encourages full cooperation between States in the conduct of investigations, the recognition of mutual interest and the exchange of information regarding investigations. In order to have a common and consistent approach for States to adopt in the conduct of marine safety investigations, in 2008, IMO adopted the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code), which was made mandatory under SOLAS. Over decades, IMO also adopted a series of non-mandatory instruments on casualty-related matters, including the latest adopted resolution A.1075(28) on Guidelines to assist investigators in the implementation of the Casualty Investigation Code.

18. Within IMO regulatory framework, the overall data collection and analysis of casualties, including those involving fishing vessels is carried out electronically through the GISIS Maritime Casualties and Incidents (MCI) module database containing a unique

¹⁰ "**occupational accident**": An occupational accident is an unexpected and unplanned occurrence, including acts of violence, arising out of or in connection with work, which results in one or more workers incurring a personal injury, disease or death.

¹¹ ILO "Recording and notification of occupational accidents and diseases. An ILO code of practice" Geneva, International Labour Office, 1996 ISBN 92-2-109451-0.

¹² ILO "Quick guide on sources and uses of statistics on occupational safety and health", 2020 ISBN: 978-92-2-033702-8 (web pdf).

collection of MCI data, as defined by circulars MSC-MEPC.3/Circ.4/Rev.1 as well as circular MSC/Circ.539/Add.2 on reports on casualty statistics concerning fishing vessels and fishermen at sea. The MCI module, which is accessible to the public, contains all marine safety investigation reports submitted to the Organization and all casualty analyses that have been approved by the III Sub Committee.

19. During the 1960s and the 1970s there was collaboration between the FAO/ILO/IMO for the development of Codes and Guidelines. The “*Code of Safety of Fishers and fishing vessels*” contains Part A (adopted in 1968) and Part B (adopted in 1974), built on the regulatory system adopted at that time. Later the FAO/ILO/IMO developed the “*Voluntary guidelines for the Design, Construction of small fishing vessels*”. These instruments did not address the need to develop statistics although Part B of the Safety Code referred to accident investigation.

20. Article 7 of the 1977 Torremolinos Convention for the safety of fishing vessels mimicked Chapter I regulation 21 of the SOLAS Convention, so that after its entry into force Parties followed the same approach applied for international shipping. The Convention never entered into force and neither did the later 1993 Protocol¹³ (IMO, 1993) which contains the same article. This article which is also remained in the CTA 2012, requires that information on the findings is submitted to the Organization, which means that fatalities should be reported once the CTA 2012 comes into force.

21. At the end of the 1980s it was clear that the available statistics on FVs accidents were not sufficient. While fatalities were very high in developed countries, data were unknown or poor in developing countries. The IMO Assembly resolution A.646 (16)¹⁴ (IMO, 1989) was adopted after a symposium held in Canada on the Safety and working conditions aboard fishing vessels. Among other issues the IMO was requested to consider, as a matter of high priority, statistics on casualties so that appropriate amendments to conventions and codes to improve the safety of fishers at sea could be introduced.

22. At the Maritime Safety Committee in 1990, IMO requested countries to submit reports in an approved circular MSC/Circ.539 with the aim to have data, using the simplified form in MSC/Circ. 539/Add. 2 (IMO, 1990)¹⁵. It is likely that there was some momentum due to the future adoption of an instrument modifying the 1977 Torremolinos Convention, which was not showing signs of entering into force. This data was probably linked to the one that ILO was aiming for at that time.

23. Circular MSC/Circ.539, due to its voluntary nature was not successful. An attempt was made again with the approval of MSC/Circ. 753¹⁶ (IMO, 1996), to invite member states to submit data irrespective of the vessel size to be able to enable the FSI Sub-

¹³ IMO “Final Act of the International Conference on Safety of Fishing Vessels, 1993, with attachments, including the Torremolinos Protocol of 1993 relating to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977 and consolidated text of the regulations annexed to the Torremolinos International Convention for the Safety of Fishing Vessels, 1977, as modified by the Torremolinos Protocol of 1993 relating thereto” ISBN 9280113178.

¹⁴ IMO. “Safety of Fishermen at Sea” Resolution A.646(16) adopted on 19 October 1989
[https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/AssemblyDocuments/A.646\(16\).pdf](https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/AssemblyDocuments/A.646(16).pdf)

¹⁵ IMO “Reports on Casualty Statistics” MSC/Circ.539/Add. 2 1990
<https://wwwcdn.imo.org/localresources/en/OurWork/MSAS/Documents/MS-Circ.539-ADD.2.pdf>

¹⁶ IMO, “Reports on Fishing Vessels and Fishermen Statistics” 1996
<https://wwwcdn.imo.org/localresources/en/OurWork/MSAS/Documents/MS-Circ.753.pdf>

Committee to prepare the relevant database. Although these two circulars are still valid, member states did not submit significant data on fatalities during that period.

24. Due to the modifications to the 1977 Convention, the 1993 Torremolinos Protocol did not fully cover fishing vessels below 45 m in length, therefore there was a need to provide a template for regional standards as provided for in article 3(5). Time had elapsed from the 1970s so it was agreed at the end of the 1990s to update the FAO/ILO/IMO codes and guidelines mentioned in the previous paragraphs^{17, 18}. These documents were approved in 2005 together with a set of safety recommendations for decked fishing vessels of less than 12 metres in length and undecked fishing vessels. In 2007 the FAO/ILO/IMO “Implementation Guidelines on Part B of the Code, the Voluntary Guidelines and the Safety Recommendations”¹⁹ were also ready to assist in the implement the three FAO/ILO/IMO instruments on the design, construction and equipment of fishing vessels of all types and sizes.²⁰

25. It is important to note that section 2.6 of the FAO/ILO/IMO implementation guidelines refer to the registration of fishing vessels and section 2.7 to casualty investigation. However, the development of statistical data as a means to assist in the investigation of maritime accidents is not addressed.

26. In the meantime, the need for the entry into force of the 1993 Torremolinos Protocol was recalled by the IMO Assembly, which is held every two years. Several IMO resolutions have encouraged its ratification e.g. A.925(22)²¹ (IMO, 2001) without any success. During this process the number of fatalities was still referred to as 80 per 100,000 fishers as estimated by ILO in the 1990s.

27. In parallel, with a focus on casualties in merchant shipping, the IMO developed a standardized taxonomy and procedures for a common approach to the investigation of maritime accidents at international level. The “Code for the investigation of marine accidents of 2008”²² (IMO, 2008), which was first adopted as an assembly resolution and therefore on a voluntary basis around 1999, and was made mandatory under SOLAS XI-1/6. This was accompanied by some momentum with the development of GISIS²³ modules (IMO, 2023) as a repository of data. One of them contains accident investigation data in the forms specified under the accident investigation code and its related guidelines, using the world fleet database as a backbone. As of September 2023 the

¹⁷ FAO/ILO/IMO, “Code of Safety for Fishermen & Fishing Vessels: Part A - Safety & Health Practices, International Maritime Organization” ISBN 9789280142082

¹⁸ FAO/ILO/IMO, “Code of Safety for Fishermen and Fishing Vessels, 2005: Part B- Safety & Health requirements for the construction and equipment of fishing vessels” ISBN 9280142097, 9789280142099

¹⁹ FAO/ILO/IMO “Implementation Guidelines on Part B of the Code, the Voluntary Guidelines and the Safety Recommendations” ISBN 978-92-5-108213-3

²⁰ Those instruments are Part B of the Code of Safety for Fishers and Fishing Vessels, the Voluntary Guidelines for the Design, Construction and Equipment of Small Fishing Vessels, and the Safety Recommendations for Decked Fishing Vessels of Less than 12 metres in Length and Undecked Fishing Vessels

²¹ IMO “Entry into force and implementation of the 1993 Torremolinos Protocol and the 1995 STCW-F Convention” A.925(22) , 2001.

[https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/AssemblyDocuments/A.925\(22\).pdf](https://wwwcdn.imo.org/localresources/en/KnowledgeCentre/IndexofIMOResolutions/AssemblyDocuments/A.925(22).pdf)

²² IMO “Adoption of the code of the international standards and recommended practices for a safety investigation into a marine casualty or marine incident (Casualty Investigation Code)” MSC.255(84)., 2008. [https://wwwcdn.imo.org/localresources/en/OurWork/MSAS/Documents/Res.MSC.255\(84\)CasualtyInvestigationCode.pdf](https://wwwcdn.imo.org/localresources/en/OurWork/MSAS/Documents/Res.MSC.255(84)CasualtyInvestigationCode.pdf)

²³ IMO GISIS database <https://gis.imo.org/Public/Default.aspx> [Last consulted 3 September 2023]

database contains 1,472 FVs accidents and only 168 accidents with one or more fatalities. In fact, the database is in somehow empty for fishing vessels-related casualties, awaiting a reporting scheme to be in force under an IMO mandatory instrument.

28. Together with the revision of the FAO/ILO/IMO guidelines, following a seminar held in Beijing in 2004, a good momentum was created, catalysed by the FAO, to amend the current 1993 Torremolinos Protocol. This led to the adoption of the “*Cape Town Agreement of 2012*” (CTA 2012) (IMO, 2013).²⁴ Contrary to merchant ships, the international databases are not accurate enough to determine the size of the FV fleets and it is difficult to ascertain the number of FVs from 24 m length that each country has because there are no well-grounded international data. When a decision had to be made to determine the number of fishing vessels for the entry into force the number of fishing vessels was by an approximation and this may be affecting to meet the conditions for the entry into force of the CTA 2012. This weakness in the international registries is a clear signal that accident databases would also be poor, especially until the expanding application of the two IMO number schemes for the identification of ships, and companies and registered owners to the fishing sector improve significantly the exhaustiveness of data.

29. Later IMO amended the IMO ship identification number scheme with two Assembly resolutions to extend the marker to non-steel vessels FVs and those from 12 m in length and/or beyond 100 gross tonnes, with the aim to have a unique identifier that would help the development of a Global Registry at FAO and help to deter Illegal, Unregulated and Unreported Fishing (IUU fishing).

30. Soon after the adoption of the CTA 2012, IMO, with the assistance from FAO, held a series of regional seminars around the world to encourage its ratification. During these seminars a questionnaire was sent to the countries in order to find out the number of fatalities. Data for more than 60 countries is available at IMO, however it was confirmed that data gathering was difficult for many administrations, and it was difficult to classify the fatalities among FV sizes.

31. In parallel IMO prepared a module with specific legislation on “non-convention ships” called GlobalReg. The requirements for fishing vessels with regards to accident investigation are similar to those established under the CTA 2012.

32. In 2016 Spain et al forwarded a document to the IMO III Subcommittee on accidents in FVs. Document III 4/14²⁵ stemmed from a FAO/IMO Joint Working group held in 2015 and the working group held during that subcommittee session. Subsequently III 4/WP 7 recalled the need to have consistent data. It was expected that the implementation of the IMO number would be helpful to improve data collection.

33. The CTA 2012 has just met the number of countries (22) required for its entry into force very soon. However, the number of ships (3,600) is not yet reached, with 964

²⁴ IMO “International regulations for the safety of fishing vessels consolidated text of the regulations annexed to the Torremolinos Protocol of 1993, as modified by the Cape Town Agreement of 2012 (Agreement)”, MSC 92/26/Add. 2 Annex 25, 2013

²⁵ IMO “Any Other Business. Comments on the outcome of the third session of the Joint FAO/IMO Ad Hoc Working Group on Illegal, Unreported and Unregulated (IUU) Fishing and Related Matters” III 4/14/4, 2017

FVs missing. As soon as the convention enters into force the Code for the investigation of accidents could be introduced in the convention via amendment and the casualty data collection system using the GISIS module on marine casualty to collect statistical information, as well as conclusions of the investigation could be strengthened. Similarly, the collection and use of information contained in situation reports (SITREPs) broadcasted by Rescue Co-ordination Centres (RCCs) could be expanded significantly.

34. Finally, the International Convention on Standards of Training, Certification and watch keeping for fishers (STCW-F) adopted in 1995 entered into force in 2012. The Convention is being implemented at national level by some parties, but the lack of ratifications was a problem and the instrument had never been amended. In the period 2016 to 2022 the convention was reviewed (IMO, 2023)²⁶ to make it similar to the STCW, which has more than 160 parties compared to the 26 parties of the STCW-F. This is a tremendous difference considering that fishers and mariners are both seafarers. The amended convention and a new code will be adopted in the first semester of 2024. The convention contains provisions applicable to fishing vessel personnel on board fishing vessels from 24 m L and above²⁷. Its article 3 indicates that “*The Convention shall apply to personnel serving on board seagoing fishing vessels entitled to fly the flag of a Party*” without restriction to the size of the vessel.

35. The safety of fishing vessels and fishers has been a matter of concern for FAO since its inception in 1945 when the Organization provided assistance in the establishment of fishery training institutions in a number of countries. With its long-standing technical cooperation programmes, FAO has always been close to the fishing sector. Under the “*Code of Conduct for Responsible Fisheries*”(FAO,1995),²⁸ article 8.1.3 requires that statistical data is developed for the fishing operations. This article could encompass some accident reporting.

36. Back in 2007 FAO reported to the UN as requested by Resolution 61/222 on oceans and the law of the sea a fisheries perspective on the question of safety of fishing vessels and fishers²⁹. The document indicated that there was not an accurate number of fishing vessels and therefore fishers. It also informed that available statistics on employment are scarce. In addition, the roles and responsibilities are not clear in the area of the safety of fishing vessels. This implies that the development of inventories of incidents is insufficient except for a few countries. As an example only accurate national databases at the level of national administrations have been developed from the end of the 1990s e.g. in the EU countries with very different depth.

37. The interest of FAO in safety during the 2000’s led the organization to develop initiatives such as “*Safety-for-fishermen*” to move this issue forward. As an example of this work the FAO publication “*Safety at sea for small-scale fisheries in developing*

26 IMO “Comprehensive review of the 1995 STCW-F convention. Consolidation of proposals related to draft amendments to the 1995 STCW-F Convention and development of the new draft STCW-F Code and other related instruments” HTW 9/WP.7, 2023

27 There is a possibility to move the threshold to fishing vessel personnel when working in FV from 45 m L of some provisions by national administrations

28 FAO.” *Code of Conduct for Responsible Fisheries*”, Rome, FAO. 1995. 41 p. ISBN 92-5-103834-5

29 FAO, “Report of the Food and Agriculture Organization as requested by United Nations General Assembly Resolution 61/222 on Oceans and Law of the Sea”
https://www.un.org/Depts/los/consultative_process/mar_sec_submissions/fao.pdf

countries” (FAO 2013)³⁰ indicates that there is very often a well-established tradition of reporting missing vessels and fishers, but this is not formalised. The document recommended to develop a system for accidents at sea reporting and also to create a database for collecting, analysing, and disseminating data on safety at sea.

38. In 2009 FAO developed a project for accident reporting systems in the program Safety at Sea for Small-Scale Fisheries in Developing Countries³¹, (FAO, 2008) to develop an easy-to-use common registration form and analysis database for developing countries on Accident reporting. In the report issues such as non-conclusive information on causes, no international harmonisation, incomplete reporting or the need of simplicity are the main problems. The report contains the experiences in Gambia, Peru and Senegal. In 2010 the “Regional Fisheries Livelihood Programme for South and Southeast Asia (RFLP)” aimed at implementing such system in Cambodia, Indonesia and Timor Leste (FAO, 2011)³². The outcome of this work leads to conclude that there are different reporting structures within the countries but there is need for flexibility.

39. The Agreement on “*Port State Measures Agreement*” (PSMA) is the first binding international agreement to target illegal, unreported and unregulated fishing (IUU fishing) by preventing vessels engaged in IUU fishing from using ports and landing their catches. In 2016 the PSMA came into force (FAO, 2023).³³

40. In 2019 FAO updated its estimated number on fishing fatalities to 32,000 per year. The Organization continued its capacity building programmes and materials on safety at sea, jointly with government counterparts, national maritime safety authorities and various Regional Fishery Bodies (RFBs).

41. FAO developed safety materials such as the “*FAO manual on safety at sea for small-scale fishers*”³⁴ that promotes the development of a safety culture in small scale fishing. The FAO manual on Safety at sea for small-scale fishers has been published in 16 languages: Arabic, Bengali, Chinese, English, French, Gujarati, Indonesian (Bahasa), Malayalam, Oriya (Odia), Portuguese, Russian, Sinhala, Spanish, Tamil, Telugu, and Turkish. More than 70 percent of the global population speak these languages and have free access to a comic style manual with simple and clear guidance on fishing safety.

42. Recognizing that information on accidents is an essential step to decrease the number of accidents and fatalities amongst fishers, FAO prepared guidelines on fisheries accident reporting and management based on international standards, models and lessons learned from various countries where similar accident management processes are in use (FAO, 2020).³⁵ It is also stated that formal reporting systems i.e. to national administration may be complemented with voluntary reporting systems. Other initiatives

³⁰ FAO “Safety for fishers: the way forward” GCP/GLO/200/MUL September 2010
<https://www.fao.org/publications/card/fr/c/7e043a11-e7f1-57a0-b191-50fcfb075405>

³¹ FAO “Accident reporting Systems for Small Fishing Vessels. Special Study within the Safety@Sea project” SSPA Sweden AB Report No 20074702, 2008

³² FAO “Final Report from the implementation of accident reporting systems in Cambodia, Indonesia, and Timor-Leste” (GCP/RAS/237/SPA) 2011

³³ [https://www.fao.org/iuu-fishing/international-framework/psma/en/\[Last Checked 01 September 2023\]](https://www.fao.org/iuu-fishing/international-framework/psma/en/[Last Checked 01 September 2023])

³⁴ FAO, Safety at sea for small-scale fisheries in developing countries”, 2019. ISBN 978-92-5-131753-2

³⁵ Holliday, E. & van Anrooy, R. 2021. The fisheries accident management process: guidelines for competent authorities. FAO Fisheries and Aquaculture Circular No. 1226. Rome, FAO.
<https://doi.org/10.4060/cb4726en>

such as the “*FAO Guidance on Social Responsibility in Fisheries and Aquaculture Value Chains*”, are still under development.

43. Part 3 of the “*Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication*”³⁶ on Ensuring an enabling environment and supporting implementation section 11, encourages data collection at the level of small fisheries in all dimensions (FAO, 2015). The inventories could encompass data on accidents and synergies between commercial and small fisheries may be explored.

44. FAO provides the only source of global fisheries and aquaculture statistics. FAO fisheries and aquaculture statistics are based primarily on data collected annually from national sources through questionnaires specific to each dataset and country data. Every year countries are requested to provide data for the latest year, as well as validate and revise data for the most recent years. The “*State of World Fisheries and Aquaculture 2022 report*” (FAO, 2022)³⁷ estimates that there are approximately 4.1 million FVs. It seems that better inventories on the FV fleet are needed. The quality of the FAO statistics is highly dependent upon the accuracy and reliability of the data collected and provided by countries.

45. Finally it is noted that the 35th Session of the Committee of Fisheries (COFI 35) in 2022 “*welcomed FAO’s capacity building work on decent working conditions and safety at sea, with an emphasis on reducing accidents and fatalities amongst small-scale fishers, fishing vessel safety standards and promotion of insurance and social protection in fisheries, and requested FAO to increase its support to developing countries on fishing safety matters and to take a lead on the establishment of a repository for fisher safety data and accident and mortality information*” .

46. In conclusion, the current conventions do not deal with establishment of safety and occupational databases. UN agencies initially developed legislation following a reactive approach, meaning that accidents or incidents could lead to the development of technical or operational legislation, despite the development of formal safety assessment on merchant ships to develop IMO legislation based on probabilities.

47. The need to gather data as a means to get a good picture of accidents and fatalities and to provide the legislators with a good basis for regulating the sector is clear, but in the field of accidents/incidents on fishing vessels these data gathering has been mainly made in developed countries and in private databases.

48. The attempts to gather accidents, either occupational or safety related have not been successful at global level, despite the efforts made by the ILO and the IMO.

49. This section has shown that there is a lack of an internationally binding set of measures that would require Flag Administrations to report all fisher casualties and investigate their root causes. While it is noted that there is one international instrument (the ILO Work in Fishing Convention C188) that requires reporting of accidents to the

³⁶ FAO “*Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication*”, Rome 2015, ISBN 978-92-5-108704-6

³⁷ FAO. “*The State of World Fisheries and Aquaculture 2022. Towards Blue Transformation*”.2022, Rome, FAO. <https://doi.org/10.4060/cc0461en>

relevant (Flag) Administration, very few fishing Nations have ratified this Convention. It is also noted that CTA 2012 requires reporting to IMO with pertinent information concerning the findings of a casualty investigations for circulation to all Parties. It is recommended to promote the ratifications of IMO/FAO/ILO conventions for the fishing vessel sector for single countries in combination meaning PSMA, ILO 188 and CTA 2012.

Reporting systems for maritime administrations

50. This section provides information on a few existing regional or national databases. This does not preclude that there are other databases in other maritime administrations, but the ones mentioned below are identified as the most relevant.³⁸

51. The National Institute for Occupational Safety and Health (NIOSH) data is a powerful source to retrieve accidents. Since 1992, the Bureau of Labor Statistics' CFOI³⁹ program of the United States (U.S) has been collecting information on the magnitude and characteristics of workplace fatal injuries in the United States. Approximately 30 data elements are collected, coded, and tabulated, including information about the worker, the fatal incident, and the machinery or equipment involved.

52. Agriculture, Forestry and Fisheries data are normally aggregated but NIOSH developed the Commercial Fishing Incident Database (CFID) to track work-related fatalities in the industry. The United States Coast Guards (USCG) have also published documentation related to fisheries mining on the NIOSH database. The database allows to separate occupational accidents from ship safety related accidents.

53. Since the entry into force of E.U. regional legislation in 2011 the EU started to prepare a database of fishing vessel accidents, which is now known as European Marine Casualty Information Platform (EMCIP). Each EU member state needs to include certain parameters for all accidents and specific information in case of very serious casualties. The mandatory reporting of this information does not include FVs below 15 m in length, however the revised directive will require to do so. The database inherited data from individual accident investigation agencies within the Member States (MS) and this is why the data is heterogeneous, meaning that there are differences among administrations on how much the database has been populated. A simple check also allows to confirm that the data contains some inconsistencies e.g related to dimensions such as length or tonnage.

54. The European Maritime Safety Agencies hosts the database which maintains a data feed into GISIS in order to fulfil reporting requirements under IMO instruments on behalf of EU MS. The data is property of each MS and only limited data is available due to confidentiality. There are academic studies which have used this data (Miguel Nunez et al, 2020) to be able to carry out quantitative safety analysis combined with Scientific, Technical and Economic Committee for Fisheries of the EU (STECF) data (EU, 2023)⁴⁰, demonstrating that this is not yet possible. The Agency publishes reports for fishing

³⁸ Taking into account that this research has been made using English, French and Spanish.

³⁹ CFOI is a Federal-State cooperative program that has been implemented in all 50 States and the District of Columbia since 1992

⁴⁰ European Commission, <https://stecf.jrc.ec.europa.eu/index.html> [Last consulted 3 September 2023]

vessels on an annual basis. The latest report focusing on FV was made in 2017 (EMSA, 2017)⁴¹ which also helped to assess the workability and the effectiveness of such a methodology and considers occupational fatalities with safety related fatalities, but allows to differentiate them both.

55. Several sources of accident data are available for researchers from national bodies such as the Chinese Maritime Safety Administration, Canadian Coast-Guard, the UK's Marine Accident Investigation Branch, Accident Investigation Board Norway or a combination, on fishing vessels. Data on near misses has a significant potential in the prevention of casualties and some databases exist, mainly maintained by the industry, e.g. Intermanager, which is difficult to use on fishing vessels.

56. The accident reporting systems developed by FAO provide background to build a sustainable reporting system based on the upon the experiences in the different pilots (FAO,2008).

57. Some companies have casualty databases. Out of this S&P Global "Casualty and Events Database"⁴² is the most well-known. This company⁴³ manages the IMO number schemes, and by default it contains the whole merchant fleet and those fishing vessels with this indicator. The accident database is fed by many stakeholders such as coastguards, SAR, government agencies, news agencies, media, classification societies, shipbrokers, harbour masters, port authorities and Maritime Administration bodies. It contains fishing vessel accidents since 2012.

58. Data can be obtained on demand basis but it is relatively expensive. In addition, unless there is a subscription the data is static. Furthermore, the amount of information that the database has for each incident is limited and does not allow for powerful data mining. However, in terms of quantification of accidents the amount accidents recorded is much larger than in any database (Nunez-Sanchez et al,2020).

59. There are other initiatives to gather and provide data such as the FISHER Platform. The latter guarantees the confidentiality of all reporters⁴⁴(Fish Safety Foundation, 2023). This type of reporting system may"fill the gaps" left by current accident investigations, mandatory and not mandatory event reporting, and other information gathering systems due to the lack of resources to gather data and capacity to investigate in some countries, and particularly in developing countries.

60. The lack of reporting happens for more than one reasons. This needs to be analysed and specific actions need to be proposed. Administrations either did not have enough support or the task at hand was too complex since the involvement of national administrations varied due to lack of capacity, resources, knowledge or since there were other priorities in the agendas of the organizations.

⁴¹ EMSA, "Safety analysis of data reported in EMCIP analysis on marine casualties and incidents involving fishing vessels ", 2018

⁴²https://cdn.ihsmarkit.com/www/pdf/0823/SPGMI2006_2844250_Casualty-and-Events-Database_Brochure_Aug2023.pdf

⁴³ Previously known as IHSMarkit

⁴⁴ Fish Safety Foundation <https://www.fishsafety.org/fisher> [Last consulted 1 September 2023]

61. Good results are achieved in some developed countries with well-grounded administrative structures. Following their standard procedures does not guarantee success in data gathering worldwide as it has been demonstrated over time.

62. Upon examination of the databases it can be seen that they are mainly populated with accidents from developed countries. There is a gap in Africa, Latin America and Asia leading to think that accidents only happen in developed countries, however this is an unbiased picture based on lack of transparency, lack of resources or collaboration.

63. A single effort to develop a database is not enough. It is likely that combined approaches, taking into account relevant existing data reporting, collection and analysing schemes need to be considered in the context of various options, including a platform connecting various database, e.g., Equasis. It needs to be sustained in time to be able to have sufficient dissemination in the sector.

Explore the areas of cooperation among FAO/IMO/ILO and other agencies in establishing such a database

64. This section explores potential cooperation among the UN agencies without precluding the participation of other agencies and bodies.

65. In 1962, FAO, ILO and IMO started to cooperate around an ILO study on working conditions of fishers. The three organizations entered into an agreement and defined areas of mutual interest and responsibility namely: FAO focuses on fisheries in general; ILO on labour in the fishing industries; and IMO on safety of life, vessels and equipment at sea.

66. In October 2000, the Joint FAO/IMO ad hoc Working Group on IUU Fishing and Related Matters was established. There have been four FAO/IMO JWGs in 2000, 2007, 2015 and 2019 and in the last one the participation of ILO was institutionalized. The Joint WG provides a mechanism for discussing synergies among the three agencies on IUU fishing and related matters.

67. In 2022, the 35th Session of the Committee of Fisheries (COFI 35) “requested FAO to take a lead on the establishment of a repository for fisher safety data and accident and mortality information”. FAO commissioned an international consultant to prepare an information document to be made available at the next Joint Work Group on Illegal, Unregulated and Unreported fishing (IUU fishing) (JWG). In the spirit of cooperation of the three agencies demonstrated by the work of JWG, the IMO Maritime Safety Committee “*encouraged continued cooperation of the Secretariats of ILO, FAO and IMO regarding safety and decent work in fisheries and the fight against IUU fishing within their respective competences*”.

68. According to this document, the high level goal of a repository/database should be to improve safety at sea and reduce accidents. Having this in mind the way to reach this aim depends on data collection factors such as the number of incidents recorded, their quality and representativeness. This determines the need to have more or less incidents recorded. The more data that is incorporated for each casualty, the better the lessons learnt and a possible extrapolation to develop legislation with proper contextualization. A database that contains a large number of accidents with limited data

for each case allows to determine the number of fatalities and call the attention of the legislators, but may be of little use to develop legislation based on the accidents themselves. This is the case of data such as S&P Global (before IHSFairplay). More detailed formation emanating from investigation processes implemented by flag or other substantially interested States may be considered sensitive and subjected to restricted submission and dissemination under the hospices of authorized public entities, e.g., IMO. However, since it may be needed to collect as many accidents data as possible from developing countries, it is suggested to start gathering simple data and later incorporate further data fields, aiming for possible semi quantitative safety analysis in the future. Statistics for detailed safety analysis should be developed at a later stage. This would also help a bottom up approach which is very much needed to gather data, however this approach needs simplicity.

69. It is of the utmost importance that a minimum degree of information is provided for each case e.g, 15 to 20 fields that could be later expanded to an approximate number of 40. As an example the EU legislation contains an annex with the minimum amount of data to be provided which stems from IMO reporting procedures, that could be simplified to encourage reporting, however it should not restrict the provision of more data such as including the accident investigation reports. Annex I of this report provides an example. GISIS reporting system is another example of a very detailed database with very limited FV input, however its layered approach could be taken into consideration.

70. In the process of data collection, it needs to be considered that using questionnaires with one question and a small set of pre-coded groups to be selected by the respondents on the basis of the information provided may be less expensive. However it will normally result in less precise measurement of distribution than the use of several questions with response alternatives designed to allow classification to the relevant groups at the processing stage (ILO, 1996)⁴⁵. This means that the development of a simple reporting system would need a good design using statistical techniques.

A single database or connecting databases

71. The work on a database may be outside of the scope of the current conventions, either into force or not, but there are possibilities to improve databases. In order for a database to be able to be exploited and mined there is a need to be connected to data on number of fishing vessels. Efforts have been made to develop proper records of fishing vessels via initiatives, such as the IMO number and FAO's Global Record, but these are not mandated by IMO or FAO conventions for fishing vessels. On the one side it is expected that national legislation makes the IMO numbers mandatory to allow for FV identification. On the other side the FAO Global Registry (now with more than 16,000 entries) is progressing well. These initiatives could be connected with accident data, even though they do not cover small-scale fishing. With due consideration to these databases, a repository also needs to be connected to a database such as S&P Global Sea-web to get fleet data⁴⁶

72. The data on the number of fishers could be provided by administrations but this would be difficult to gather. This data is of the utmost importance. A possibility could be to connect it with seaworthiness or safety certificates. The possibility to allow to connect databases, at least those from administrations, easily would be desirable. However, it

⁴⁵ ILO "Recording and notification of occupational accidents and diseases. An ILO code of practice" Geneva, International Labour Office, 1996 ISBN 92-2-109451-0

⁴⁶ <https://www.spglobal.com/marketintelligence/en/mi/products/sea-web-maritime-reference.html>. [Last consulted 1 September 2023]

should be conveyed that the purpose would not be to (over) control the sector. Assistance would be needed for current database hosts/administrations.

Knowing the limitations

73. Indicators on occupational accidents and injuries are volatile, and unexpected but significant accidents or national calamities bring about strong annual fluctuations (M. Nunez-Sanchez, 2017). Hence, short-term trend analyses of occupational safety and health measures are rather difficult (ILO, 2020). Instead, trend analyses should better focus on studying the underlying longer-term trend behind such sharp changes. Therefore, the areas of cooperation for a repository need to be long lasting with the need of continuous contributions. Otherwise analysing trends will not be possible.

74. Since small scale fisheries⁴⁷ account for 90% of the world fishers, it needs to be put into question how much of it can be captured in the database. It seems likely that self-subsistence fishing could not be pursued, but small-scale fishing is needed. In order to access administrations at local level FAO has better worldwide deployment than the rest of the organizations. Commercial fisheries and small scale should be included but thresholds to exclude self-subsistence are needed. The aquaculture sector is also important, but it needs to be assessed up to which point it will be possible to include it and whether it needs to be differentiated.

75. At the level of the IMO the reporting system to GISIS is not mandatory for fishing vessels until the entry into force of CTA. The III Sub- Committee deals with accident investigation seldom discusses FVs accidents beyond the cases of collisions with cargo carrying ships. IMO should encourage reporting of these accidents but the only binding safety convention dealing with “fishing vessel personnel” is the STCW-F. When the CTA 2012 comes into force accident investigation tasks could be strengthened, but it cannot be known how much casualty reporting in GISIS will increase, since the current repository has limited support and a separate effort is needed.

76. A repository of accidents without the possibility to calculate the exposition to accidents and to convey the message of the extreme danger of this work sector would not be sufficient. With data on seafarers on each ship data fatalities rates per 105 fishers or fatalities/ship*year are possible and some “proxis” may be made e.g. to calculate the exposition per hours of work. This is why data on fishers is needed. In the future data such as time exposition based on AIS or other equipment can be obtained from monitoring systems and therefore enriching the database. The connection with VMS systems will provide additional benefits in the future. The two mentioned ILO documents on statistics and the voluntary code provide a good source to set the base of what is needed.

77. At enterprise/company level the practice of recording is difficult to set unless the company follows a management system. Article 33 of ILO 188 advocates for risk analysis. These assessments can be carried out when there is limited information but

⁴⁷ “Small Scale Fishing” Traditional fishing performed by family units rather than commercial units, using a relatively small amount of capital and energy, and carrying out short fishing trips close to coasts and mainly for local consumption (FAO, 2018a).

the corrective actions are better designed when there is a wealth of information⁴⁸. Company reports are important but the current safety culture may not allow this.

Bridging the digital divide and providing value.

78. How can we bridge the gap between accident reporting in developed vs developing countries? The concept of the digital divide can be explained from two perspectives: the existing gap between those countries that have ample access to electronic research information and those that do not, and the difference in Internet literacy and aptitude between the citizens of developed versus developing countries. The latter scenario may actually be considered to be a direct result of the former. In the fishing sector the gap is huge due to a combination of both. Up to the end of 2010's the degree of literacy among fishers was low in some developing countries, this is why there are always exceptions with regards to the use of English for fishers qualifications, e.g. GMDSS.

79. Furthermore, during the course of mandatory IMO Member State Audit Scheme (IMSAS) audits in developing countries the lack of accident investigation resources is recurrent, implying that a database is far from practicable for some maritime administrations. These administrations should be getting an advantage when a reporting system is set. Some administrations may provide the largest amount of data but they will need help and also see the advantages in reporting. This is even more important if voluntary reporting systems are incorporated in parallel. The concept of flag State MoU was developed to share accident investigation capabilities among administrations and a first MoU was signed in the Pacific region.

80. In order for those in the developing world to catch up the more advanced nations of the industrialized world, educational resources must be improved. According to Duncan Campbell, no developing country has made substantial progress in the information economy or achieved entry into global value chains in information and knowledge-based services without an educated, skilled workforce. This is important in the fisheries sector where fishers are taking more risks. *"The irony is that while many emerging countries lack the strong economic bases needed to fund online information resources for their citizens and the administration, those same resources, once implemented, can go a long way toward improving the education of the people, and a better educated population is more likely to result in an improved economy and less fatalities"*⁴⁹(S. Brooks et al, 2005). The digital divide in accident reporting needs to be bridged.

81. Hence when a reporting system is implemented it would need to be designed to make a difference for those who have and those who do not have easy access to it. Added value is needed for all, not only for the Administration, and this added value needs to be identified e.g. making more transparent fishers well-being in the platforms.

Safety Culture

⁴⁸ Article 33 Risk evaluation in relation to fishing shall be conducted, as appropriate, with the participation of fishers or their representatives.

⁴⁹ Sam Brooks, Paul Donovan, and Clint Rumble "Developing Nations, the Digital Divide and Research Databases" *Serials Review* 2005; 31:270–278

82. In the context of data reporting the national administrations and the UN Agencies should promote a 'safety culture' facilitating the spontaneous reporting of occurrences and thereby advancing the principle of a 'just culture'. 'Just culture' is an essential element of a broader 'safety culture', which forms the basis of a robust safety management systems or to improve the level of fishers not discouraging from reporting occurrences by the fear of self-incrimination. The sector needs to get a positive result out of this either direct or indirect. Reporting should be part of the safety culture when developing the questionnaires. When reporting safety culture and support to fishers folk needs to be transmitted too.

Voluntary reporting systems

83. By agreement with the competent authority, small organisations may put in place simplified mechanism for the collection, evaluation, processing, analysis and storage of details of occurrences. They may share those tasks with organisations of the same nature, while complying with the rules on confidentiality and protection. In case, when voluntary reporting systems are used they have to be:

- a) standardised to facilitate information exchange including a taxonomy; and
- b) compatible with software such as those in mobile phones

84. The handling of the reports should be done with a view to preventing the use of information for purposes other than safety, and should appropriately safeguard the confidentiality of the identity of the reporter and of the persons mentioned in occurrence reports, with a view to promoting a "just culture" and bridging the gap in the "digital divide".

Review database components. Data security, longevity, levels of formality, consistency in data, transparency, harnessing data, costs, oversight in managing databases, managing priorities

85. This section focuses on the different components of a database. It builds on some of the elements of Part II. The database also needs to acknowledge its own limitations due to the “infrequency” of accident occurrence compared with other data. Collecting a sufficient sample might require multiple years of accident data to be collated. During that period, the conditions, technologies and behaviours of vessels which led to accidents change, but what could be useful in the past for developed countries may be useful in the present for developing countries.

Purpose of the database

86. Accident reporting is used to determine the causes of accidents to be able to prevent them in the future. Reports may help fishers to avoid accidents in the future and reduce costs, for designers of ships or equipment to improve, for insurance companies to calculate premiums (which should depend on accurate databases) or for regulators to develop legislation.

87. For some stakeholders, the more information provided the better. In the current state of technology accident databases may provide a wealth of data for better ship design. Furthermore, a regulation is better justified when it leads to the prevention of accidents. Although some regulations may be developed intuitively a proper safety analysis with risk assessments is a better tool, however needs data and the data may help to develop models.

88. In the field of fishing vessels, due to the lack of data, risk analysis based on accident statistics becomes extremely difficult. This means for example that the development of well sustained legislation is extremely limited and leads to the solution to develop future legislation based on SOLAS or copying national legislations because of lack of solid data ground.

89. This lack of solid ground is sustained in the lack of knowledge in the fleet/fishers population which helps to develop frequencies and/or probabilities.

90. Hence in the case of fishing vessel accidents we might copy the IMO system, including all the taxonomy and probably the accident investigation code, leading to a picture of the risks involved similar to merchant ships but this would only work on large FVs.

91. On the other hand simple databases may not help to avoid accidents in the future simply because they would be quantifying cases with limited fields, but there is a fundamental limitation in the sector. It is therefore proposed that the database allows for the following:

- Input a minimum amount of data.
- Expand on the data needed by national administrations and those involved in data analysis and development of legislation
- Supervision of the data collected to avoid double counting or double reporting.
- Being able to adapt into the future to have a holistic approach.

Data consistency

92. Data needs to be consistent to avoid faulty inputs, which may skew the results, but in order to be able to do this a scheme is necessary. A tight and long scheme leads to a burden to enter data in a certain format which has the advantage, when properly developed, to allow to for data analysis and drafting the necessary reports quicker.

93. As indicated in the previous part of this document the reporting system should have different functionalities depending to the level of access so that reporting becomes: easy, and increasing in complexity if accident investigators provide data. An example is provided in Annex to document “The fisheries accident management process. Guidelines for competent authorities”⁵⁰

94. All the reporting systems, including the voluntary reporting systems should follow an agreed taxonomy and due to the level of literacy of fishers whenever voluntary reporting systems are used due care needs to be taken. A glossary to introduce values/tables would need to be developed. It could also be interesting to introduce a simple risk assessment tool for each of the accidents to be able to qualify the accident (probability and consequences) by the reporter.

Confidentiality/Anonymization

95. Data should be anonymized at the highest possible level. This would encourage reporting.

96. The input would need to be processed and the confidentiality and anonymous character of the use of information would needs to be granted. In order to encourage reporting of occurrences, it should be appropriate to protect not only reporters, but also persons mentioned in the occurrence reports Although the database may contain personal details relating to the reporter and to the persons mentioned in occurrence, reports and any details, including the name of the actors involved in the occurrence, would have to be removed when a report is issued. The input needs to be processed following a clear strategy and the confidentiality and anonymous character of the use of information is given.

97. Care needs to be taken when by law a person has the obligation to report that same occurrence, and intentionally fails to report it; meaning that person could lose his or her protection. Similarly, without prejudice to national criminal law and the proper administration of justice, it is important to clearly demarcate the extent of the protection of the reporter and other persons mentioned in occurrence reports from prejudice or prosecution⁵¹ (EU, 2014).

Underreporting

⁵⁰ FAO “The fisheries accident management process. Guidelines for competent authorities” NFIFO/SLC/C1226 (En), Rome, 2021 ISBN 978-92-5-134412-5

⁵¹ EU, Regulation (EU) 376/2014 of the European Parliament and of the Council of 3 April 2014 on the reporting, analysis and follow-up of occurrences in civil aviation, 2014

98. A database of accidents would need to consider that there always be underreporting. This underreporting would need to be estimated to be able to develop statistics that can be a better reflection of the reality.

99. This is done comparing the accident database to be developed with an existing one e.g private data, and compare the input of both sources to determine the unknown quantity of accidents using some filtration and approximations, such as Chao's lower limit estimation or Chapmans

Incentives

100. In order to increase reporting mechanisms incentives would need to be introduced. Currently the sector has no incentives for reporting and on top of this there is little or no interest in reporting since it leads to delays, paper work, loss of rating and little value for fishers.

101. Reporting needs to provide added value for the communities so that the sector is put in focus for positive issues or to call attention on areas of poverty and low wellbeing. This would bring synergies with labor, safety and the fisheries economy and ecology.

102. In mandatory reporting systems at the level of national administration fishers could get the impression than overseeing the incident would seem better than reporting, so incentives are needed.

103. In addition, when experimenting with systems for collecting data, uploading it to the "cloud" in order to validate it, using statistical models to obtain estimates of fishers safety and well-being almost instantaneously, would be beneficial.

Data security

104. During the registration/filing process the information should also be de-identified to ensure a confidential status particularly to voluntary systems.

105. The database host when discharging their obligations in relation to the information contained in the database should:

- ensure the confidentiality avoiding breaches of security of the information; and limit the use of the information to what is strictly necessary in order to discharge their safety-related obligations without attributing blame or liability.

106. A Security standard should be followed⁵².

Longevity

107. Upon the review of accident statistics of fishing vessels in developed countries it can be identified that it is difficult to have a trend in accidents. A saw-tooth like is the typical shape, where there are years with a large number of fatalities probably because

⁵² Such as ISO/IEC 27001 and/or NIST SP 800-53

of the sinking of a large ship, which may be considered an isolated case and therefore no action being taken.

108. The lack of suitable data in a long time series is difficult to assess because it cannot be inferred whether the incident may occur again and statistical analysis is difficult to apply (M. Nunez-Sanchez, 2017)⁵³. In addition, there is a need to put in context the accidents and fatalities considering the period, the size of the fleet and the number of fishers⁵⁴.

109. As indicated in the previous part in order to set a trend a large number of years is needed and then being able to carry out a simple analysis, therefore there is a need to keep the data base active with suitable input, including the number of fishers and number of ships. The longevity of the project needs to be ensured so that the database may have multiple other uses and continuity. Training would be needed at local level to incentivise reporting by fishing communities.

Levels of formality

110. One of the problems that a repository has is whether it needs to use a backbone the national reporting systems and how these can be made compatible. For the fishing sector it is recommended to follow a step approach asking for simple data on occupational and safety accidents (EMSA, 2017) to be able to move forward.

111. Of course, there are challenges to collecting data in developing countries, including limited resources, logistical challenges, and cultural barriers. However, these challenges can be overcome with the right tools and strategies. For example, mobile phones and other technology can be used to collect data remotely, and partnerships with local organizations can help to build trust and overcome cultural barriers to develop a suitable bottom up approach. Data collection would need to adapt to possible different ways to do it such as using fishers associations or communities.

112. In order to ensure a proper level of formality it is recommended that voluntary systems also are tested by Governments to be able to populate data and address the main concerns.

Transparency

113. With regards to transparency dis-identified information shall be made available to all relevant parties including fishers, for example to allow them to discharge their obligations in relation to safety. A good balance is needed to avoid a restrictive approach where only the Administrations and the administrators of the database would benefit from the provision of data.

⁵³ M. Nunez-Sanchez "Establecimiento y evaluación de un nivel de seguridad de la flota pesquera nacional de menos de 24 m de eslora", UPM, 2017
https://oa.upm.es/48688/1/MIGUEL_JUAN_NUNEZ_SANCHEZ.pdf

⁵⁴ A. Jaleel, D.Grewal, "A Perspective on Safety and Governance Issues of Fishing Vessels" Chapter 4. WMU 2017 http://commons.wmu.se/lib_chapters/4

Harnessing data/Costs

114. There needs to be economic support for the databases, both public and private, but the later requires a tangible demonstrating that they will be successful.

115. When funding has been provided the data should not belong to the host but to the donor. This data (in xml files) should be provided to the FAO/ILO/IMO and the data provider for free protecting confidentiality.

Oversight in the management of the databases

116. The oversight in the management of the database should be a joint effort among the three agencies and those agencies and administrations involved, but a steering committee may be needed.

Managing priorities

117. Priorities need to be made consistent with available data. Subsistence, small-scale and commercial can be considered three different groups but it is easier to determine the fishers population as they are engaged in large scale fishing and small scale excluding self-subsistence in a first step to expand in the future. A list of priorities and how to manage them would need to be drafted.

Proportionality

118. Each stakeholder should report in a proportionate manner. It is not the same for a self-subsistence fisher to report than for an administration. Different levels should be established.

119. In addition, the database needs to aim to be populated worldwide and not only by developed countries. Accidents in Africa, Asia and Latin America are very important and need to be recorded.

Quality

120. The quality of the database needs to be good enough to fulfil its target. In the midterm they need to comply with a standard⁵⁵

Looking into the future

121. Gathering data on the internet using artificial intelligence could be possible. There have been projects to incorporate data from press releases to complement accident databases at national level (Miguel Nunez, 2017). At time the terminology used online was too heterogeneous to carry out a sophisticated analysis and this had to be done with academic tools to search the key words. However, this area of knowledge is quickly evolving, including the analysis of accident reports and provide conclusions, while databases are populated.

⁵⁵ Such as ISO 8000 series provides frameworks for improving data quality for specific kinds of data.

122. As an example there are studies focused on Natural Language Processing (NLP) and Machine Learning methods to analyse accident narratives and extract useful information. A Machine Learning approach to classify unstructured accident reports into basic accident types (e.g., “health/safety”, “leak/spill”, “operation”). NLP algorithms to derive a more informative and helpful set of keywords from raw accident reports can be developed (Tamascelli, N et al 2022)⁵⁶. As indicated by Tamascelli the performance of the models largely depends on the quality of input data and the nature of the model itself. That is, if accident data are incomplete or uncertain, the choice of a model with advanced abstraction and generalization capabilities over a memorization-oriented model may not be advisable due to the risk of overgeneralization and overfitting. Thirdly, the performance of the model also depends on data availability. That is, the performance of the models degrades if extremely rare events are considered. This way forward requires the development of a good taxonomy that will help to develop a model and can be used worldwide.

123. If accident analysis leads to the prevention then safety analysis, modelling (using techniques such as neural networks) would be needed. In this case the representativeness of the training data to future predictions becomes less strong (Guikema, 2020)⁵⁷. This issue has more to do with sophisticated datamining. It also needs to be considered that the risk samples may be weak when combining the accidents with AIS data (Pietrzykowski et al., 2020)⁵⁸ because of the low frequency.

124. As the global fishing industry continues to face scrutiny for its environmental impact, the use of artificial intelligence (AI) to monitor fishing vessels is gaining traction as a viable solution. The researches carried out are promising as indicated in the report “*Artificial Intelligence and the fisheries sector*” (European Parliament, 2022)⁵⁹. AI-powered systems can provide real-time data to identify illegal fishing activity, monitor fishing vessel movements, and detect potential overfishing. The use of AIS data to monitor FVs in order to tackle IUU is possible and has a lot of potential to prevent accidents, but this needs to be considered in view of the amount to data to analyse.

125. However, when dealing with small scale fisheries some FVs may not have AIS data. In developing countries fishing vessel may not have VHF with DSC. Gathering data on small scale is not possible worldwide (unless tracking mobile phones). With suitable models it could help to provide data on casualties, but this still far away. The MASS concepts are not useful for a repository of accidents.

126. A repository needs to be open to these developments.

Suggested way forward

⁵⁶ Nicola Tamascelli et al, 2002 “Learning from major accidents: A machine learning approach Computers & Chemical Engineering”

⁵⁷ [Guikema S.](#) “Artificial Intelligence for Natural Hazards Risk Analysis: Potential, Challenges, and Research Needs *Risk Analysis Volume 40, Issue 6* , 2020 <https://doi.org/10.1111/risa.13476>

⁵⁸ Pietrzykowski Z., Wielgosz M., Breitsprecher M. “Navigators behaviour analysis using data mining” *Journal of Marine Science and Engineering*, 8 (2020), p. 1 [10.3390/jmse8010050](https://doi.org/10.3390/jmse8010050)

⁵⁹ European Parliament 2022, “Artificial Intelligence and the fisheries sector” Policy Department for Structural and Cohesion Policies Directorate-General for Internal Policies PE 699.643 – May 2022

127. The previous sections were used to set the frame, find areas of cooperation and areas to consider on the development of a repository. This section proposes a way forward to be discussed at the JWG.

128. The document recommends that FAO, IMO together with ILO agree on a phased approach as follows:

Phase 1 (years 2024-2026):

- o JWG to agree on the overall aim of the repository, responsibilities, and a roadmap
 - o FAO to host a Joint Expert Workshop to:
 - Agree on the data system's objective, scope and tasks that will be threefold:
 - Determine the relevant scope of fatalities;
 - Improve safety at sea and support casualty data analysis to identify main and contributing factors and prevent reoccurrence; and
 - Reduce labour accidents.
 - Ensure that all relevant fishing-related activities are considered, as appropriate, including small-scale fisheries.
 - Develop an architecture by identifying:
 - Options for data management systems, including existing data collection systems and data system;
 - assessing the potential of an hybrid mode of reporting including mandatory and recommendatory governmental/non-governmental reporting schemes;
 - taxonomy;
 - Source IT, preparing a plan to cover:
 - data security,
 - transparency and dissemination of information, including a potential option for anonymization,
 - data sharing,
 - incentives,
 - monitoring, and
 - access.
 - Find potential participants and partners other than UN Agencies to collaborate, including financial partners.
 - FAO/IMO/ILO bring recommendations to the consideration/approval of their appropriate bodies.
- Phase 2 (year 2026-2027)
 - Gather initial data. In order to do this:
 - o Develop a prototype and a pilot that needs to be flexible enough to adapt to the different schemes.

- o Encourage national administrations to provide data (including through webinars and workshops), which may include additional metadata (even accident investigation reports).
 - o Connect to fleet databases containing ship details.
 - o Encourage data provision at local level including by fishers and local administrations through online and/or face-to-face safety training and raising awareness on the importance of a repository.
 - o Ensure data security, anonymization and the provision of reports both of progress of the database and also with possible analysis.
 - o Issue regular reports to FAO/ILO/IMO via web pages.
 - o Provide assistance to countries for data and information analysis.
- Phase 3 (years 2027-2030)
 - o Scale up the pilot data system, add additional fields to be able to carry out additional analysis and quality assessments.
 - o Monitor behaviours and create further incentives for developing countries' participation.
 - o Ensuring longevity of the data system.
 - o Issue regular reports to FAO/ILO/IMO via web pages.
 - o Provide analysis.

Action request of the Joint Working Group

127. The Joint Working Group is invited to note the information provided in the document.

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