



Food and Agriculture
Organization of the
United Nations

EAF-Nansen Programme's work on marine litter and microplastics

Summary of achievements 2019–2023

FAO EAF-Nansen Programme Report No. 77
EAF-N/PR/77 (En)



PROGRAMME REPORT

THE EAF-NANSEN PROGRAMME

The EAF-Nansen Programme “Supporting the Application of the Ecosystem Approach to Fisheries Management considering Climate and Pollution Impacts” supports partner countries and regional organizations in Africa and the Bay of Bengal improving their capacity for the sustainable management of their fisheries and other uses of marine and coastal resources through the implementation of the Ecosystem Approach to Fisheries (EAF), taking into consideration the impacts of the climate and pollution.

The EAF-Nansen Programme is executed by the Food and Agriculture Organization of the United Nations (FAO) in close collaboration with the Institute of Marine Research (IMR) of Bergen, Norway, and funded by the Norwegian Agency for Development Cooperation (Norad). This Programme, which started in 2017, represents the current phase of the Nansen Programme which started in 1975.

The aim of the Programme is that sustainable fisheries improve food and nutrition security for people in partner countries. It builds on three pillars, Science, Fisheries Management, and Capacity Development, and supports partner countries to produce relevant and timely evidence-based advice for fisheries management, according to the EAF principles and to further develop their human and organizational capacity to manage fisheries sustainably. In line with the EAF principles, the Programme adopts a broad scope, taking into consideration a wide range of impacts of human activities and natural processes on marine resources and ecosystems including fisheries, pollution, climate variability and change.

A new state of the art research vessel, the *Dr. Fridtjof Nansen*, is an integral part of the Programme. A comprehensive science plan, covering a broad selection of research areas, and directed at producing knowledge for informing policy and management decisions, guides the Programme’s scientific work.

The Programme works in partnership with countries, regional organizations, other UN agencies as well as other partner projects and institutions.

EAF-Nansen Programme's work on marine litter and microplastics

Summary of achievements 2019–2023

by

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**FAO EAF-Nansen Programme Report No. 77
EAF-N/PR/77 (En)**

Programme report

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Abstract

Marine litter is a global problem and has increased substantially in recent years. This report provides a summary of the results achieved by the EAF-Nansen Programme as part of its Science Plan, through additional funding received under an addendum, on the occurrence and impacts of marine litter and microplastics in the Gulf of Guinea. Three areas of work were identified, which allowed to improve the understanding of the presence of microplastics in marine ecosystems, generate knowledge on the occurrence of marine debris through the use of the research vessel *Dr. Fridtjof Nansen*, enhance the capacity of the countries involved and provide scientific foundations for appropriate action at various levels. An improved sampling protocol for marine debris was developed and successfully tested.

There has been a perception in the Gulf of Guinea region that the presence of marine litter could have an adverse effect on the beach seine fishery. A study was conducted in four countries, namely Benin, Côte d'Ivoire, Ghana and Togo, to gather sociodemographic, fisheries and environmental data to record the impact of marine litter on the fishing communities. A separate report on the study is available. The results of the study are expected to inform local, national and regional management actions to devise actions to reduce the impact of litter in fishery.

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Abbreviations

ATR-FTIR	attenuated total reflectance Fourier-transform infrared spectroscopy
EAF	ecosystem approach to fisheries
FAO	Food and Agriculture Organization of the United Nations
GESAMP	Group of Experts on the Scientific Aspects of Marine Environmental Protection
IMR	Institute of Marine Research
Norad	Norwegian Agency for Development Cooperation

1. Introduction

As part of the EAF-Nansen Programme, Norad, the donor provided additional funding through an addendum¹ to the EAF-Nansen Programme on marine litter and microplastics. The addendum was intended to strengthen two of the three Programme outcomes:

1. Fishery research organizations provide relevant and timely scientific advice for management; and,
2. Fisheries management institutions manage fisheries sustainably.

The addendum had the following original goal:

'Within the context of the EAF-Nansen Programme, the specific goal is to advance knowledge on presence of marine debris and microplastics in the marine ecosystems for improved policies and proposals'.

The programme to be supported by the addendum was split into three Areas of work:

1. Improved understanding of the presence of microplastics in marine ecosystems;
2. Improved knowledge on the occurrence of marine debris, including on lost or abandoned fishing gear, in marine ecosystems, based on the surveys with the R/V *Dr. Fridtjof Nansen*; and,
3. Knowledge generated used in management and policy processes.

Each Area of work consisted of several activities (activities A to J):

Area of work 1 - Improved understanding of the presence of microplastics in marine ecosystems

Activity A: Enhance data on the occurrence of microplastics in marine ecosystems (water column and benthic habitats) and in the marine food chain (with special emphasis on fish).

Activity B: Laboratory analysis to determine the potential sources of plastic particles and to determine abundance and type of plastic particles in fish, as well as their potential impacts on fisheries resources and food safety.

Activity C: Generating knowledge on microplastics in marine ecosystems: data processing, data analysis and mapping of results on geographical distribution and other trends that can be determined based on the samples.

Activity D: Development of geographically referenced database.

¹ Addendum - Occurrence and impacts of marine litter and microplastics based on the surveys with the R/V *Dr. Fridtjof Nansen*.

Area of work 2 – Improved knowledge on the occurrence of marine debris, including on lost or abandoned fishing gear, in marine ecosystems, based on the surveys with the R/V *Dr. Fridtjof Nansen*.

Activity E: Develop an improved sampling protocol for marine debris for use on board the R/V *Dr. Fridtjof Nansen* (based on the Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP) guidelines) and implement the new protocol during surveys.

Activity F: Analyse data collected through the surveys to produce initial occurrence maps of marine debris and other trends that can be determined based on the samples of [both] macro plastics.

Activity G: Analyse video material to identify and map presence of marine debris at sea.

It was intended that capacity development would be integrated into the activities, in the form of training during the surveys with the R/V *Dr. Fridtjof Nansen* and both on-line and in-person training workshops, covering sample processing, analysis and data interpretation.

Area of work 3 – Knowledge generated used in management and policy processes.

Activity H: Informing global and regional processes with improved knowledge on marine debris and microplastics.

Activity I: Enhance the science-management advice framework at the national and regional level.

Activity J: Implementation at the local level of mitigation measures using relevant parts of the FAO guidelines and in the context of EAF management plans (in three countries²).

In financial terms, the addendum was dealt with as a separate budgetary item. However, the addendum activities were integrated within the main EAF-Nansen Programme Science Plan for practical purposes. Most of the addendum activities fell under Theme 6 (Pollution) with a small element under Theme 8 (Food safety). Tables 1 (Outcome 1) and 2 (Outcome 2) provide a summary of how the addendum Areas of work and activities were aligned with the main programme outcomes, outputs and activities, and the Science Plan Themes. It is hoped these tables will help to minimise confusion with the Programme structure and use of terminology.

² Expanded to add Ghana to the original three countries selected in the Gulf of Guinea: Benin, Côte d'Ivoire and Togo.

**Table 1. Aligning activities under the addendum to the overall EAF-Nansen Programme outcomes, outputs and activities:
Outcome 1: Fishery research organizations provide relevant and timely scientific advice for management; work areas:
1 - microplastics, 2 - marine litter, 3 - management and policy processes**

EAF-Nansen Programme - Outcome 1			Science Plan Theme		Addendum - marine litter and microplastics												
Output	Activity				Work area			Addendum activity									
			6	8	1	2	3	A	B	C	D	E	F	G	H	I	J
1.2 Availability of survey data and information	1.2.3	Enhance data on microplastic abundance in water, sediments															
	1.2.3	Enhance data on microplastic abundance in fish															
	1.2.5	Develop sampling protocol for marine debris															
1.4 Implementing the science plan	1.4.2	Plan and carry out research, prepare scientific publications															
1.5 Tools and methods for analysis and reporting	1.5.3	Development of geographically referenced database for microplastics and marine debris															

**Table 2. Aligning activities under the addendum to the overall EAF-Nansen Programme outcomes, outputs and activities:
Outcome 2: Fisheries management institutions manage fisheries sustainably; work areas:
1 - microplastics, 2 - marine litter, 3 - management and policy processes**

EAF-Nansen Programme - Outcome 2			Science Plan Theme		Addendum - marine litter and microplastics												
Output	Activity				Work area			Addendum activity									
			6	8	1	2	3	A	B	C	D	E	F	G	H	I	J
2.1 Support - national policy	2.1.4	Support selected countries and regions															
2.5 Support - national management plans	2.5.2	Assist in development and implementation of national management plans															
	2.5.3	Assist in development and implementation of regional fisheries plans															

2. Achievements under the addendum by activity

A summary of key achievements under each of the programme activities is provided in Table 3 and a list of outputs in Annex I.

Area of work 1 – Improved understanding of the presence of microplastics in marine ecosystems

Activity A: *Enhance data on the occurrence of microplastics in marine ecosystems (water column and benthic habitats) and in the marine food chain (with special emphasis on fish).*

Extensive sampling for floating microplastics was carried out in surface waters around the coasts of West and East Africa and in the Bay of Bengal, from the R/V *Dr. Fridtjof Nansen*. These are regions for which there are few, if any, data on the abundance of microplastics. Samples were collected using a towed Manta trawl and sorted and processed on-board, before being transferred for chemical analysis in specialist laboratories at IMR Bergen (Figure 1). Training in sampling techniques and sample processing was undertaken during the surveys, and by means of an on-line training workshop. A method was developed to allow the sampling and separation of microplastics in sediment cores. A new method for sampling microplastics in seawater was trialled successfully using an underwater pump. Additional samples were taken from fish and other marine organisms, from both West Africa and the Bay of Bengal.

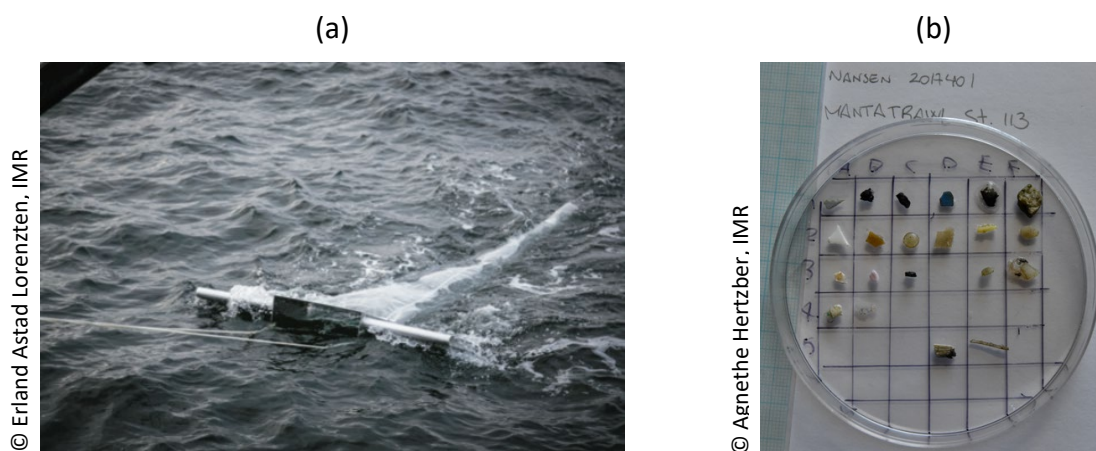


Figure 1. (a) Manta trawl deployed from the R/V *Dr. Fridtjof Nansen*, used to collect floating microplastic particles from surface waters; (b) microplastic particles preparation for visual characterization

Activity B: *Laboratory analysis to determine the potential sources of plastic particles and to determine abundance and type of plastic particles in fish, as well as their potential impacts on fisheries resources and food safety.*

Analysis of microplastics was carried out at IMR Bergen for identification of polymer composition. Particles greater than 1 mm were analysed by ATR-FTIR (attenuated total reflectance Fourier-transform infrared spectroscopy), combined with use of database/library software to identify individual polymers (Figure 2).

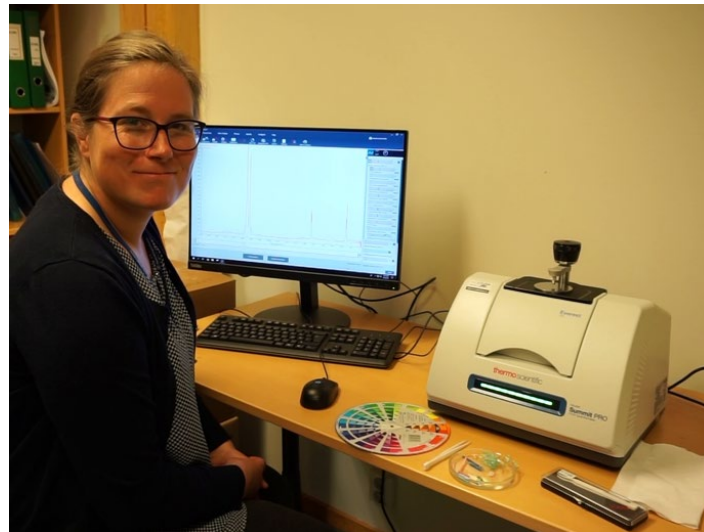


Figure 2. Analysis of polymer type using infrared spectroscopy (FTIR)

For smaller particles, methods were developed to allow their separation from biological matrices and analysis by GC-MS (gas chromatography mass-spectrometry) following pyrolysis (thermal decomposition).

An in-person training course was held at IMR for participants based in partner countries in West Africa. The course was aimed at providing researchers with a good grasp of the basics of sampling, handling and analysing microplastics in the laboratory, using both ATR-FTIR and GC-MS (Figure 3).



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Figure 3. Participants in a training workshop on microplastics analysis, IMR, December 2023

Activity C: *Generating knowledge on microplastics in marine ecosystems: data processing, data analysis and mapping of results on geographical distribution and other trends that can be determined based on the samples.*

The data obtained under activities A and B have been analysed, mapped (Figure 4) and prepared for publication (Table 3).



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Figure 4. Location of sampling stations for floating microplastics - image generated from the Pilot Nansis-Litter database

Activity D: Development of geographically referenced database

A geographically referenced database for marine litter and microplastics data was developed at IMR Bergen in two stages. Firstly, a Pilot Nansis-Litter database was created and evaluated. This was then revised and extended to form an operational version. This followed a philosophy of using open-source software (Python programming language, PostGIS and QGIS)³, to allow flexibility in design and operation without the need for potential users needing to obtain software licences (Figure 5).

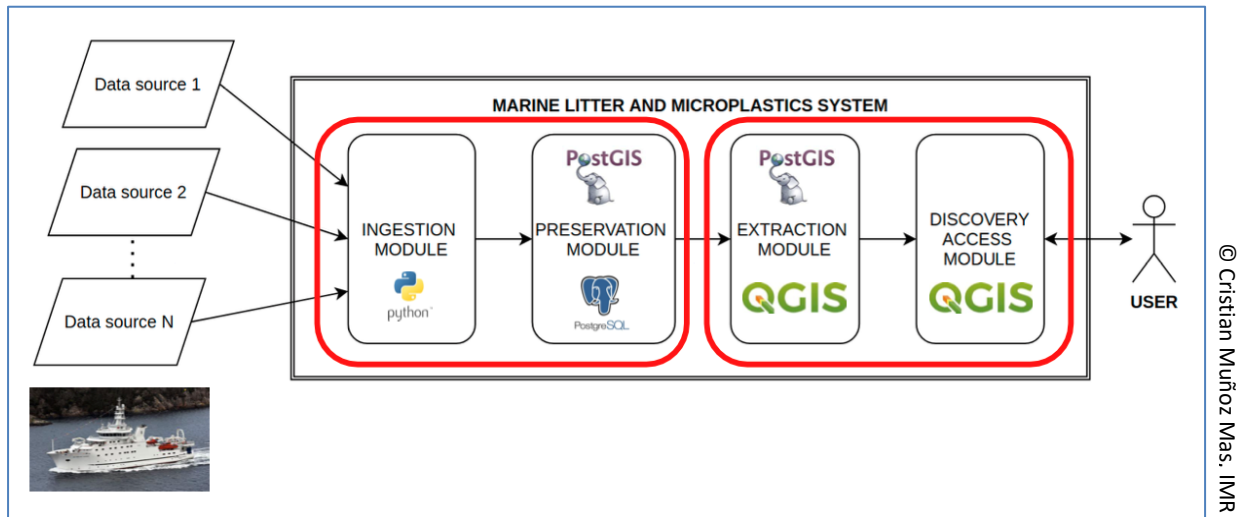


Figure 5. Structure of the Pilot Nansis-Litter database

Area of work 2 – Improved knowledge on the occurrence of marine debris, including on lost or abandoned fishing gear, in marine ecosystems, based on the surveys with the R/V Dr. Fridtjof Nansen

Activity E: Develop an improved sampling protocol for marine debris for use on board the R/V Dr. Fridtjof Nansen (based on GESAMP guidelines) and implement the new protocol during surveys.

Guidelines have been developed for use by researchers in EAF-Nansen Programme Partner Countries to assist in sampling and recording marine litter, to a consistent standard. They are intended primarily for use on trawl surveys with the R/V Dr. Fridtjof Nansen to record litter caught in the trawl net as 'bycatch'. In addition, the Guidelines can be used for surveys of beach litter and the 'bycatch' of litter in beach seines and other nearshore fishing gears. The Guidelines are compatible with those developed by regional bodies such as OSPAR and ICES. An on-line training workshop was conducted on the principles of conducting marine litter sampling and introducing the guidelines.

³ <https://www.python.org/>
<https://postgis.net/> <https://qgis.org/en/site/>

Activity F: Analyse data collected through the surveys to produce initial occurrence maps of marine debris and other trends that can be determined based on the samples of [both] macro plastics.

The distribution of seafloor litter has been recorded as the quantity of litter retrieved as bycatch in demersal trawls during fish surveys, since 2011. A compilation of data from EAF-Nansen surveys from 2011 to 2020, based on 534 bottom trawls, was published by Buhl-Mortensen *et al.* (2022). Plastic was the largest category and accounted for almost half the litter by number of items. Fisheries-related litter accounted for 22 percent by number (Figure 6). There were significant regional variations and some 'hot spots'. Sampling took place off the coasts of West and East Africa and in the Bay of Bengal (Figure 7).

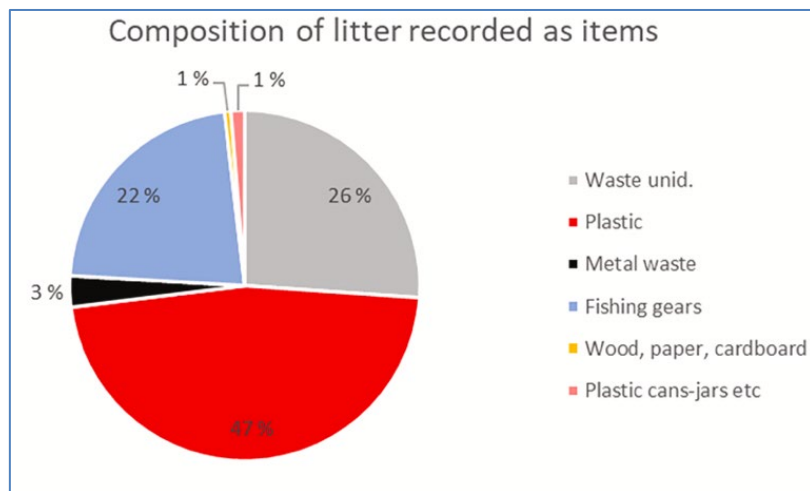


Figure 6. Average composition of litter collected as bycatch in demersal trawls, by number of items, off the coast of West and East Africa and the Bay of Bengal (2011–2020)

A new marine litter protocol was introduced in 2022, providing greater detail of the different categories of litter. It was revised in 2023 to include photographs of litter retrieved in the trawls operated from the R/V *Dr. Fridtjof Nansen* and additional instructions, following an evaluation. It will be published as an information document and translated into additional languages, initially French.

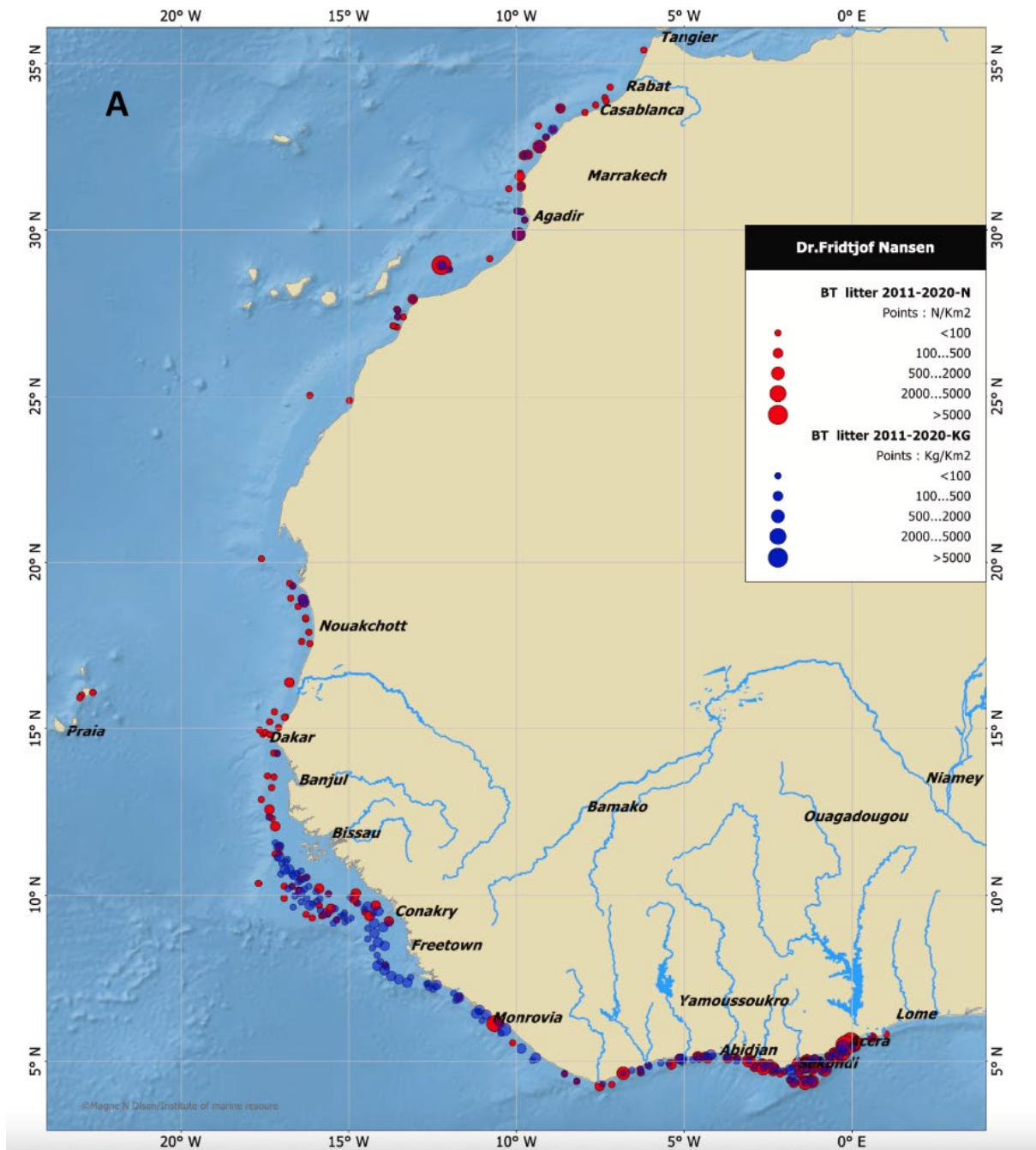


Figure 7. Distribution of seafloor litter as recovered in demersal trawls taken on surveys on the R/V *Dr. Fridtjof Nansen* of the coast of West Africa: red circles indicate number of litter items km² seafloor; blue circles mass of litter in kg km² seafloor; taken from Buhl-Mortensen *et al.* 2022, reproduced under creative commons CC BY licence (<http://creativecommons.org/licenses/by/4.0/>)

Activity G: *Analyse video material to identify and map presence of marine debris at sea*

Video transects taken as a component of habitat surveys were examined to record the presence of litter. An on-line training course was organized on conducting video surveys and interpreting the footage.

Area of work 3 – Knowledge generated used in management and policy processes

The focus under this Area of work (**activities H to J**) was the beach seine fishery of the Gulf of Guinea. This is a key source of nutrition and economic activity in the region, involving several tens of thousands of people.

Activity H: *Informing global and regional processes with improved knowledge on marine debris and microplastics*

A study was conducted on the impact of marine litter on the fishing communities of four partner countries: Benin, Côte d'Ivoire, Ghana and Togo. This involved: field surveys of representative communities; recording the amount and categories of litter retrieved in the seine nets (Figure 8) and found on the shoreline; and, conducting interviews with individuals from the each of the main groupings involved, for example, net owners and fish sellers. The interviews provided a qualitative assessment of the social and economic impact of marine litter on the various members of the fishing communities (Figure 9). It also yielded information about the demographics of those involved, current waste management practices and the preferred means of communication. This information will be of use when considering potential remedial measures to reduce the impact of litter on the fishery.

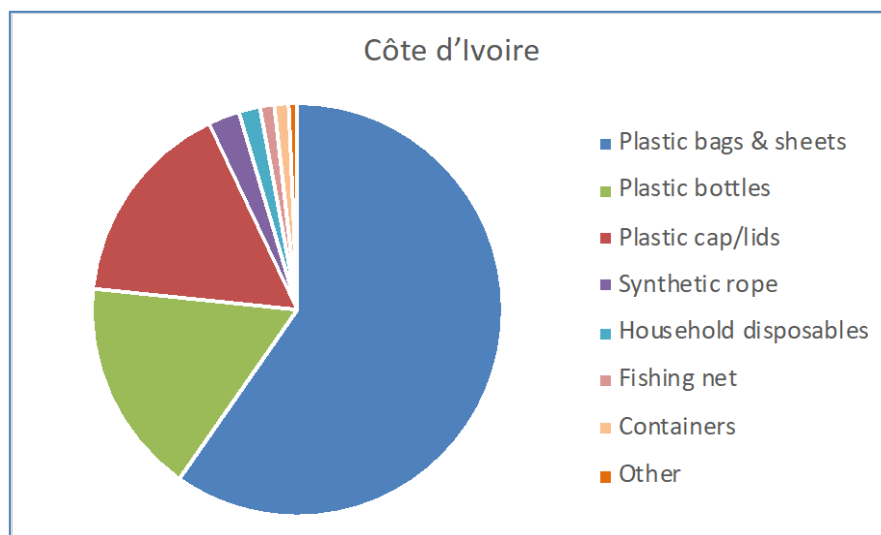


Figure 8. Example of the relative quantities of different categories of litter retrieved from the beach seine nets - average values for Côte d'Ivoire

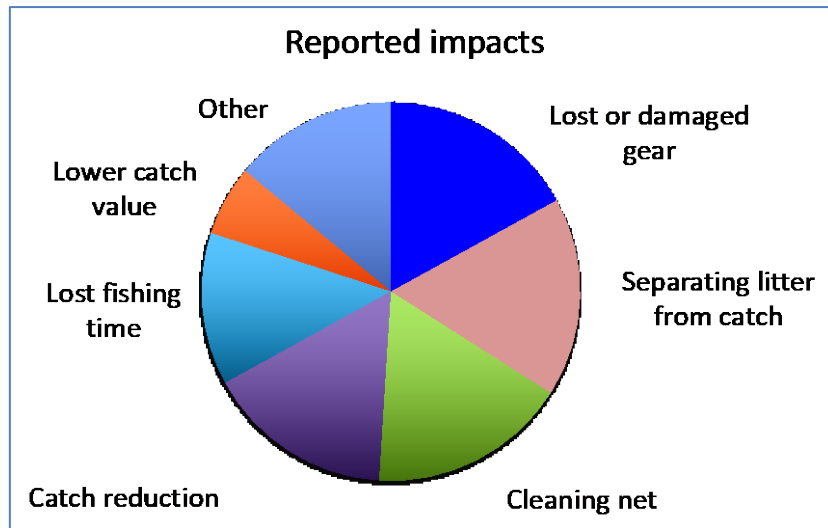


Figure 9 Perceived relative impacts of marine litter, shown as the average from all fishing communities, from interviews with selected individuals from the fishing communities

Activity I: *Enhance the science-management advice framework at the national and regional level*

An important component of the addendum was informing the Programme of relevant initiatives by local and regional bodies, as well as other intergovernmental organizations, such as UNEP, UNIDO and IMO, and identifying potential opportunities for cooperation. This included providing briefings on progress in improving the international governance of waste and marine litter.

Activity J: *Implementation at the local level of mitigation measures using relevant parts of the FAO guidelines and in the context of EAF management plans (in 3 countries⁴)*

The findings of the marine litter impact study are being incorporated into the revised beach seine fisheries management plans in Benin, Côte d'Ivoire and Togo.

⁴ Expanded to add Ghana to the original three countries selected in the Gulf of Guinea: Benin, Côte d'Ivoire and Togo.

Table 3. Summary of activities and outputs under each addendum activity, as of December 2023

Activity		Status as of December 2023
1.2.3	Enhance data on microplastic abundance in water, sediments	<ul style="list-style-type: none"> – Data generated on microplastic abundance in seawater - West and East Africa, Indian Ocean and Bay of Bengal – Protocol developed for sampling microplastics in sediments
1.2.3	Enhance data on microplastic abundance in fish	<ul style="list-style-type: none"> – Data generated on microplastic concentrations in biota from Morocco – Data generated on microplastic concentrations in fish from Bay of Bengal
1.2.5	Develop sampling protocol for marine debris	<ul style="list-style-type: none"> – Protocol developed, tested on surveys by <i>Dr. Fridtjof Nansen</i>, revised and prepared for publication – Data generated on seafloor marine litter abundance off West and East Africa, Indian Ocean and Bay of Bengal from trawl sampling – Data generated on seafloor marine litter abundance off West and East Africa, Indian Ocean and Bay of Bengal from analysis of video, as a component of habitat surveys
1.4.2	Plan and carry out research, prepare scientific publications	<p>Training:</p> <ul style="list-style-type: none"> – Workshop on microplastic sampling and analysis (on-line) – Workshop on marine litter sampling (on-line) – Hands-on 3-day workshop on microplastic sampling and analysis (IMR Bergen) – Concept note - proposal to establish microplastics laboratory in West Africa (potentially Food Research Institute, Accra) to act as a regional facility for researchers from partner countries in West Africa. <p>Publications:</p> <ul style="list-style-type: none"> – Buhl-Mortensen <i>et al.</i> 2022. Mar. Poll. Bull., Litter on the seafloor along the African coast and in the Bay of Bengal based on trawl bycatches from 2011 to 2020 – Kögel <i>et al.</i> Plastic content in the ppm range in mixed trawl draws of marine animals from the coast off Northwest Africa - manuscript awaiting permission from Morocco – Kögel <i>et al.</i> Microplastic concentrations in fish from the Bay of Bengal (in preparation) – Grøsvik <i>et al.</i> Microplastic abundance in seawater measured off West and East Africa - manuscript being finalised – Grøsvik <i>et al.</i> Microplastic abundance in seawater in Bay of Bengal - manuscript being finalised – Grøsvik <i>et al.</i> Comparison of sampling methods for microplastics in seawater using Manta trawl and continuous plankton sampler - manuscript being finalised
1.5.3	Development of geographically referenced database for microplastics and marine debris	<ul style="list-style-type: none"> – Geographically referenced database for microplastics and marine debris developed and maintained at IMR
2.1.4	Support selected countries and regions	<ul style="list-style-type: none"> – Internal report - Regional reports (original French and revised in English) of the study on the impact of marine litter on the beach seine fishery in Benin, Côte d'Ivoire, Ghana and Togo – Nansen Programme Report on The impact of marine litter on the beach seine fishery of four countries in the Gulf of Guinea: Benin, Côte d'Ivoire, Ghana and Togo

Activity		Status as of December 2023
2.5.2	Assist in development and implementation of national management plans	<ul style="list-style-type: none"> – Rationale for follow-up study re-evaluated and not pursued – Engagement with related national initiatives on waste management – National management plans being finalised, to include marine litter – Further actions to be considered in next phase
2.5.3	Assist in development and implementation of regional fisheries plans	<ul style="list-style-type: none"> – Engagement with related regional initiatives on waste management

3. Timeline of activities under the addendum

The ten addendum activities were intended originally to be completed within three years (2019–2021). However, planned work was delayed or otherwise affected by the COVID-19 pandemic in 2020 and 2021. This was due to several factors including: the cessation of surveys by the R/V *Dr. Fridtjof Nansen*; a delay in initiating fieldwork in West Africa due to transport restrictions; the prevention of planned face-to-face training workshops; and, restricted access to laboratory facilities resulting a reduced throughput of samples and delays in producing new data. As a consequence, the duration of the addendum was extended to December 2023. Table 4 presents a summary of when activities A to J were undertaken, during the period 2019–2023.

Table 4. Summary of activities A to J under the addendum (marine litter and microplastics) with timeframe for undertaking them (extended by two years from original three-year duration 2019–2021, as a consequence of the disruption caused by the COVID-19 pandemic)

Area of work / activity	2019	2020	2021	2022	2023
Area of work 1: Improved understanding of the presence of microplastics in marine ecosystems					
Activity A: Enhance data on the occurrence of microplastics in marine ecosystems (water column and benthic habitats): and in the marine food chain (with special emphasis on fish).	X	(X) ^{CP}	(X) ^{CP}	X	X
Activity B: Laboratory analysis to determine the potential sources of plastic particles and to determine abundance and type of plastic particles in fish, as well as their potential impacts on fisheries resources and food safety.	X	(X) ^{CP}	(X) ^{CP}	X	X
Activity C: Generating knowledge on microplastics in marine ecosystems: data processing, data analysis and mapping of results on geographical distribution and other trends that can be determined based on the samples.	X	(X) ^{CP}	(X) ^{CP}	X	X
Activity D: Development of geographically referenced database.	X	X	X	X	X
Area of work 2: Improve knowledge on the occurrence of marine debris, including on lost or abandoned fishing gear, in marine ecosystems, based on the surveys with the R/V <i>Dr. Fridtjof Nansen</i>					
Activity E: Develop an improved sampling protocol for marine debris for use on board the R/V <i>Dr. Fridtjof Nansen</i> (based on GESAMP guidelines) and implement the new protocol during surveys.	X	(X) ^{CP}	(X) ^{CP}	X	X
Activity F: Analyse data collected through the surveys to produce initial occurrence maps of marine debris and other trends that can be determined based on the samples of [both] macro plastics.			(X) ^{CP}	X	X
Activity G: Analyse video material to identify and map presence of marine debris at sea.				X	X

Area of work / activity	2019	2020	2021	2022	2023
Area of work 3: Feeding the knowledge generated into management and policy processes					
Activity H: Informing global and regional processes with improved knowledge.	X	(X) ^{CP}	(X) ^{CP}	X	X
Activity I: Enhance the science-management advice framework at the national and regional level.			(X) ^{CP}	X	X
Activity J: Implementation at the local level of mitigation measures using relevant parts of the FAO guidelines and in the context of EAF management plans (in 3 countries). ⁵					X

(X)^{CP} Activity delayed/restricted by restrictions imposed due to the COVID-19 pandemic.

⁵ Activities H, I and J - expanded to include four countries in the Gulf of Guinea: Benin, Côte d'Ivoire, Ghana and Togo.

4. References

Buhl-Mortensen, L., R. Houssa, W.R.W.M.A.P. Weerakoon, P. Kainge, M.N. Olsen, S. Faye, M.M. Wagne, S. Myo Thwe G. Cudjoe Voado & B.E. Grøsvik. 2022. Litter on the seafloor along the African coast and in the Bay of Bengal based on trawl bycatches from 2011 to 2020, *Marine Pollution Bulletin* 184, 114094.

EAF-Nansen Programme. 2024. Guidelines for the sampling, identification and recording of marine litter – Marine litter protocol and identification guide Version 1.0.

Annex I. List of outputs prepared under the addendum in the period 2019 to 2023

Reports

2019

- Development plan for sampling protocol for marine litter on the R/V *Dr. Fridtjof Nansen*, June 2019
- Regional and international processes – summary note, June 2019
- Summary of outcomes of regional and international workshops attended relevant to the EAF-Nansen Programme, June 2019
- Action plan for marine debris and micro plastic activities under the EAF-Nansen Programme, June 2019
- Categories of marine litter proposed for the EAF-Nansen Programme
- Exploring a potential partnership between the EAF-Nansen Programme, COBSEA and IOC-WESTPAC – initial discussion, November 2019
- Training opportunities for the monitoring of marine litter and microplastics, December 2019
- Report on meetings attended (in person) as part of the contract, December 2019

2020

- International and regional processes of relevance to the EAF-Nansen Programme – 2nd update, April 2020
- Revised Work Plan for the EAF-Nansen Programme on marine litter and microplastics, 2019–2021, June 2020
- Second progress report Microplastics and marine litter, July 2020
- Publications planned on marine litter and microplastics
- Interim implementation plan, October 2020
- Protocol for sampling microplastics in sediments, November 2020

2021

- Study on the impact of marine litter on the beach seine fishery in the Gulf of Guinea (Côte d'Ivoire, Benin, Togo and Ghana) under the EAF-Nansen Programme – Background Document, April 2021
- Summary of progress – Microplastics and marine litter, July 2021
- Etude d'impact des déchets marins sur la pêche de la senne de plage au Benin, Togo, Ghana et Côte d'Ivoire, Revue bibliographique [Benin], (Wongla, K.K.S.), July 2021
- Progress report field survey [Ghana] - Study of the impact of marine litter on the beach seine fishery in the Gulf of Guinea (Abrokwah, S.), October 2021
- Etude d'impact des déchets marins sur la pêche de la senne de plage au Togo (Sedzro, K.M.), October 2021

2022

- Etude d'impact des déchets marins sur la pêche de la senne de plage au Bénin, Togo, Ghana et Côte d'Ivoire – Rapport de l'enquête de terrain (Souhou, Z.), February 2022
- Rapport final d'enquête sur l'impact des déchets marins sur la pêche de la senne de plage du littoral Ivoirien (Sankare, Y.) April 2022
- Etude d'impact des déchets marins sur la pêche de la senne de plage au Bénin (Wongla, K.K.S.), May 2022
- Marine litter Monitoring Log-sheet and photo-identification guide – Draft June 2022
- Litter on the seafloor along the African coast and in the Bay of Bengal based on trawl bycatches from 2011 to 2020 (Buhl-Mortensen *et al.*, Mar. Poll. Bull., 184, 114094)
- Summary of progress - microplastics and marine litter, July 2022

2023

- Final report (September 2022–August 2023), August 2023
- *Sargassum* - status of *Sargassum* accumulations in a West Africa context, August 2023
- The impact of marine litter on the beach seine fishery of four countries in the Gulf of Guinea: Benin, Côte d'Ivoire, Ghana and Togo - A preliminary investigation of the social and economic impacts of marine litter on fishing communities. FAO EAF-Nansen Programme Report No. 76
- L'impact des déchets marins sur la pêche à la senne de plage de quatre pays dans le Golfe de Guinée : Bénin, Côte d'Ivoire, Ghana et Togo – Une étude préliminaire des impacts sociaux et économiques des déchets marins sur les communautés de pêcheurs. FAO Rapport du Programme EAF-Nansen n° 76
- Marine litter - assessing the distribution and impact of marine litter in Africa and the Bay of Bengal (information brochure), December 2023
- Report on training course in sampling, processing and analysis of microplastics, December 2023
- Guidelines for the sampling, identification and recording of marine litter - Marine litter protocol and identification guide Version 1.0, December 2023.
- Proposal to establish a laboratory in West Africa, to act as a regional hub (revised), December 2023

Training courses

- Sampling microplastics at sea (on-line), June 2021
- Recording marine litter (on-line), March 2022
- Use of video surveys to record seafloor litter
- Sampling, processing and analysing microplastics – in person training workshop, December 2023

Marine litter is a global problem and has increased substantially in recent years. This report provides a summary of the results achieved by the EAF-Nansen Programme as part of its Science Plan, through additional funding received under an addendum, on the occurrence and impacts of marine litter and microplastics in the Gulf of Guinea. Three areas of work were identified, which allowed to improve the understanding of the presence of microplastics in marine ecosystems, generate knowledge on the occurrence of marine debris through the use of the research vessel *Dr. Fridtjof Nansen*, enhance the capacity of the countries involved and provide scientific foundations for appropriate action at various levels. An improved sampling protocol for marine debris was developed and successfully tested.

There has been a perception in the Gulf of Guinea region that the presence of marine litter could have an adverse effect on the beach seine fishery. A study was conducted in four countries, namely Benin, Côte d'Ivoire, Ghana and Togo, to gather sociodemographic, fisheries and environmental data to record the impact of marine litter on the fishing communities. A separate report on the study is available. The results of the study are expected to inform local, national and regional management actions to devise actions to reduce the impact of litter in fishery.

For more information:

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