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EAF-Nansen Programme Information paper

Please note that National Reports and SC Working Group reports shall be classified as working papers

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Abstract

The Nansen Programme began in 1975 as a joint initiative of Norway and the Food and Agriculture Organization of the United Nations (FAO). Its objective was to help newly independent states improve food security by identifying resources in their seas and oceans to support the development of their fisheries. A research vessel, Dr Fridtjof Nansen was built for the programme, serving as a laboratory for research, training and the exchange of knowledge. For over 40 years, the Nansen Programme has assisted developing countries in fisheries research and management and has been acclaimed as a unique mechanism for cooperation, knowledge generation and exchange in developing regions, particularly in Africa.

In the last decade the programme operated as the EAF-Nansen Project and supported knowledge generation for and the implementation of the Ecosystem Approach to Fisheries (EAF) management in Africa.



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SOUTHERN INDIAN OCEAN FISHERIES AGREEMENT (SIOFA)

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**National Research Institute of Fisheries Science
Yokohama, Japan**

EAF-Nansen Programme Information paper



**EAF-
Nansen Programme**



1. INTRODUCTION

- **Historical background**

The **Nansen Programme** began in 1975 as a joint initiative of Norway and the Food and Agriculture Organization of the United Nations (FAO). Its objective was to help newly independent states improve food security by identifying resources in their seas and oceans to support the development of their fisheries. A research vessel, *Dr Fridtjof Nansen* was built for the programme, serving as a laboratory for research, training and the exchange of knowledge. For over 40 years, the Nansen Programme has assisted developing countries in fisheries research and management and has been acclaimed as a unique mechanism for cooperation, knowledge generation and exchange in developing regions, particularly in Africa. The Nansen Programme has journeyed through various phases, adapting and evolving to address new ocean issues and challenges that have come to light.

In the last decade the programme operated as the **EAF-Nansen Project** and supported knowledge generation for and the implementation of the Ecosystem Approach to Fisheries (EAF) management in Africa. As such, the programme supported the piloting of the implementation of EAF for fisheries management in selected fisheries through the development of fisheries management plans. Through this orientation, the programme has furthered its emphasis on tackling transboundary ecosystem issues, fostering cooperation and collaboration, and harmonizing approaches towards a sustainable management of fisheries. Working with 31 coastal countries in four regional groupings around Africa, the programme has strengthened national and regional fisheries management bodies, providing each with the necessary skills and knowledge to implement EAF.

The **EAF-Nansen Programme** started in May 2017, carrying forward the objectives of the EAF-Nansen Project, with particular attention to issues of sustainability and threats to marine ecosystems, broadening its scope to also consider pollution and climate change besides fisheries impacts. The vision for the new Programme is to “Partner with developing countries, other international organizations and programmes to advance knowledge on impacts of multiple stressors on marine ecosystems, fisheries and biodiversity in tropical/subtropical regions, and to support the countries to be better prepared to address these through improved management and adequate policies”.

It will continue to support the implementation of EAF, while also broadening the scope of its scientific research to incorporate research and survey work that extends beyond pure fisheries concerns. The new programme builds on the paradigm of participatory knowledge-based decision-making, and therefore aims to strengthen the link between knowledge generation, including the research activities of the *Dr Fridtjof Nansen* research vessel, and policy, legislation and decision-making at regional and national levels.

A new state-of-the-art research vessel – the third *Dr Fridtjof Nansen* – was made available to the programme and started its work in May 2017 to continue the work of its two predecessors. It has been equipped with the latest technologies to further its research and data collection capacity and tackle new and emerging challenges in marine research and fisheries management. The vessel will also provide a reliable platform for national and international partners to gather data on the oceans and play a key role in providing knowledge necessary to understand the effect of pollution and climate-related changes on marine resources. The research vessel, that flies the UN flag as the house flag, is owned by the Norwegian Agency for Development Cooperation (Norad) and operated by IMR. The

vessel is, who provides scientific services to the running of the survey programme and to the implementation of the associated science plan.

2. PROGRAMME OVERVIEW

The long-term objective or impact of the Programme is that *“Sustainable fisheries improve food and nutrition security for people in partner countries”*.

To contribute to this long-term objective, the Programme works towards three mutually reinforcing Outcomes:

Outcome 1: Fishery research institutions provide relevant and timely scientific advice for management

Outcome 2: Fisheries management institutions manage fisheries according to the EAF principles

Outcome 3: Fisheries research and management institutions have appropriate human and organizational capacity to manage fisheries sustainably

These three Outcomes represent the three pillars of the EAF-Nansen Programme, provide overall direction and serve to group the outputs and activities into the following three categories: science and science-based advice, fisheries management and capacity development. The outputs related to each outcome are presented in Figure 1 below.

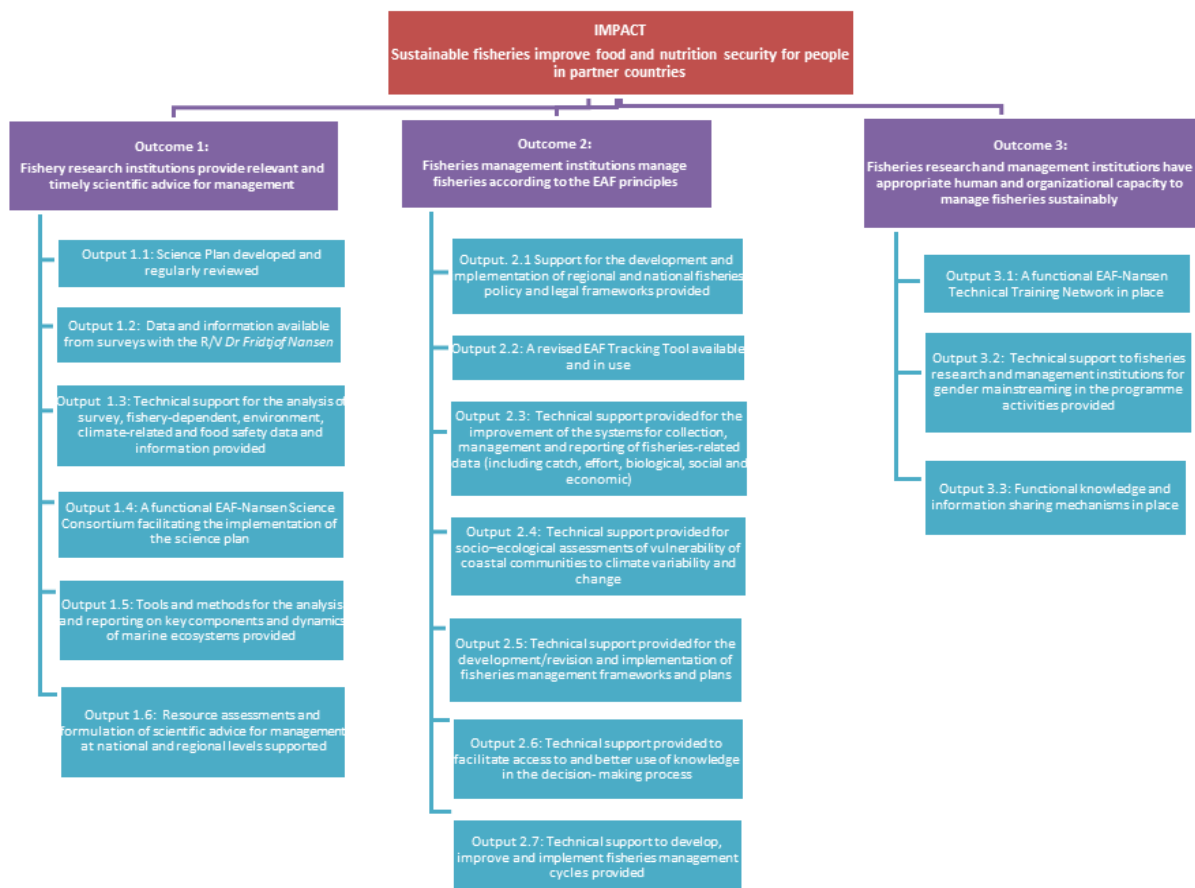


Figure 1: EAF-Nansen Programme: Impact, Outcomes and Outputs.

In total the Programme has 16 expected outputs, six in relation to science and delivery of scientific advice (15 activities), seven in relation to fisheries management (23 activities), and three in relation to capacity development -including gender and communication (15 activities).

A science plan has been developed that outlines the research themes to be addressed by the Programme. This was developed in consultation with international, regional and national partners and includes three main topics: (i) sustainable fisheries, (ii) oil/gas/pollution/habitat mapping and (iii) climate change. The science plan is further subdivided into 11 research themes.

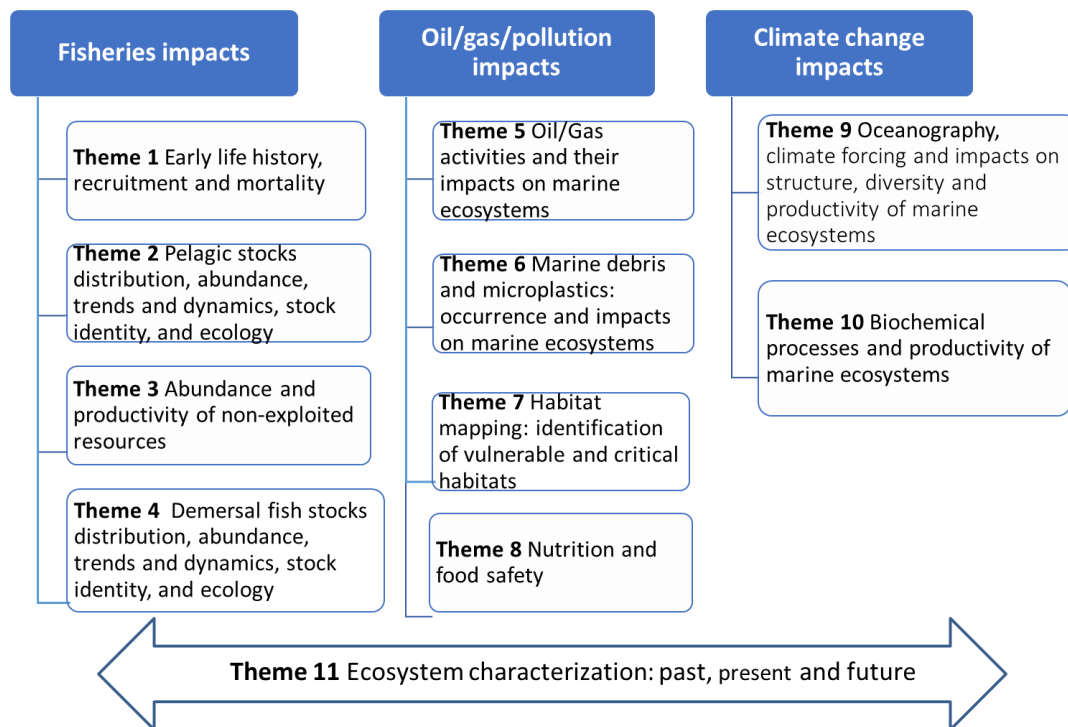


Figure 2: EAF-Nansen Programme science plan themes

The research theme of highest relevance to SIOFA is possibly Theme 7. The objective of the **Research Theme 7** is to provide information on bottom habitats, and particularly on the presence of vulnerable habitats for which special care is required when planning activities that may affect them.

Relevant information gathered, documented and conveyed to scientific advisors and managers is both of physical and biological nature. Thus, data on substrates, seabed geomorphology, benthic organisms (primarily megabenthic epifauna) and species assemblages inhabiting different benthic environments will be collected. The activity entails targeted mapping of selected areas and VMEs, rather than large scale biological and ecological assessments that require more time and effort. Sampling for physical and chemical oceanography (ocean acidification and alkalinity), and observations on marine debris, including abandoned fishing gear, are standard in all surveys, including Theme 7-related surveys.

Bottom habitat studies are primarily dedicated to the deep sea of ABNJs, where knowledge on species and habitat diversity is still very poor while pressure exists. Where there may be interest by coastal states, preliminary studies within EEZs can also be conducted based on multibeam echosounder data.

The information gained through Theme 7 will be of relevance to different agencies for marine spatial planning and to fisheries agencies to reduce the impacts of fishing on bottom habitats. Furthermore, work in ABNJs will be coordinated in close cooperation with relevant RFMOs (e.g. SEAFO, SIOFA, etc.) and results will continue feeding into decision making processes of these RFMOs.

Theme 5 (Oil/Gas activities and their impacts on marine ecosystems) is also highly relevant to SIOFA inasmuch as it gains knowledge that can be used for environmental impact assessment of

oil/gas/mining activities. In this context, information needed for identifying vulnerable marine habitats, such as sediment, benthos, and visual observations of organisms on the sea floor, are also collected.

In addition, collection of data on megabenthic epifauna from the demersal trawl surveys conducted under Theme 4 within countries EEZs provides data over larger geographic scales, with potential for habitat suitability modelling. Further, it will allow correlation between demersal fish biomass, abundance and diversity with benthic organisms and enable assessment of significant adverse impacts of fishing on the benthos.

3. REVIEW OF THE ACTIVITIES CARRIED OUT IN THE SIOFA AREA IN THE FRAMEWORK OF THE EAF-NANSEN PROGRAMME

Outcome 1: Fishery research institutions provide relevant and timely scientific advice for management

- **Planning meetings and pre-survey meetings**

In 2017, two planning meetings were organized for the Indian Ocean region, one in Colombo (Sri Lanka) and one in Port Louis (Mauritius), to discuss the Programme, and in particular to receive feedback on the content of the science plan, identify regional research priorities and to plan the surveys with the R/V “Dr Fridtjof Nansen” in the Indian Ocean. One of the surveys identified was a survey on the Saya de Malha Bank in collaboration with the Joint Management Area (JMA) authorities, for which an additional pre-survey meeting was held in the Seychelles in May, just prior to survey start.

- **Surveys**

In 2018 the vessel was used to survey the waters of the Western Indian Ocean and the Bay of Bengal. Three main survey legs with a total of 14 sub-legs have been carried out.

Leg 1 covered the east coast of Africa from South Africa to Tanzania with a broad ecosystem perspective interspaced by a survey to address issues related to assessment of environmental impact of oil and gas activities in Northern Mozambique (Theme 5), before a mesopelagic transect carried out between 20 April and 2 May when the vessel called to port on Victoria, Seychelles.

The broad ecosystem approach adopted for the survey aimed at gaining understanding of ecosystem status in general and of specific ecosystem components and attributes.

Sampling was undertaken in relation to hydrographic conditions, plankton, egg and larvae, jellyfish, demersal, pelagic and mesopelagic resources, bottom sediment, top predators. Opportunistic sampling for pollution (microplastics and food safety) was also undertaken throughout the survey.

Leg 2.1 covered Saya de Malha and Nazareth Banks from 4 May to 3 June. The main aim of this survey was to enhance knowledge on the marine ecosystem and morphological structure of the Saya de Malha Bank with emphasis on:

- Geomorphology, benthic habitats and benthos (Multibeam mapping in subareas and along pre-determined transects, habitat and benthos studies emphasizing sandy subareas and subareas with macroalgae, seagrass, and coral)

- Fish and crustacean resources (density mapping with acoustic and optical technologies, emphasizing commercial and toxic species)
- Physical and chemical oceanography, including current measurements (onboard measurements)

In addition, sampling in support of studies with wider geographical scope conducted on other surveys under the EAF-Nansen Programme will be conducted, e.g. tissue sampling for genetics, contaminants, mammal recording, recording of microplastics and litter.

Leg 2.2 was an oceanographic/mesopelagic transect covering the area between Mauritius and Sri Lanka. Finally, Leg 3 covering the Bay of Bengal and Andaman Sea (including Sri Lanka, Bangladesh, Myanmar and Thailand) was an ecosystem survey with different focus for different sub legs according to national priorities. Table 1 below provides a complete overview of the different survey legs in 2018.

Table 1: R/V *Dr Fridtjof Nansen* survey programme 2018

<i>Leg</i>	<i>Departure</i>	<i>Arrival</i>	<i>Days of survey</i>	<i>Number of participants</i>	<i>M</i>	<i>F</i>
<i>Leg 1.1 - South Africa</i>	26/01 Durban, South Africa	10/02 Maputo, Mozambique	15	20	10	10
<i>Leg 1.2 - Mozambique</i>	12/02 Maputo, Mozambique	6/03, Pemba, Mozambique	21	20	15	5
	6/03, Pemba, Mozambique	19/03, Pemba, Mozambique	12	21	16	5
<i>Leg 1.3 - Mozambique oil</i>	21/03, Pemba, Mozambique	4/04 Dar es Salaam, Tanzania	14	16	8	8
<i>Leg 1.4 - Tanzania</i>	6/04 Dar es Salaam, Tanzania	18/04 Dar es Salaam, Tanzania	12	19	15	4
<i>Leg 1.5 Mesopelagic transect</i>	20/04 Dar es Salaam, Tanzania	2/05 Victoria, Seychelles	12	14	12	2
<i>Leg 2.1</i>	4/05 Victoria, Seychelles	3/06 Port Louis, Mauritius	30	21	12	9
<i>Leg 2.2</i>	5/06 Port Louis, Mauritius	21/06 Colombo, Sri Lanka	16	8	5	3
<i>Leg 3.1 - Ecosystem survey</i>	24/06 Colombo, Sri Lanka	16/07 Colombo, Sri Lanka	22	20	15	5
<i>Leg 3.2 - BOB Mesopelagic transect</i>	19/07 Colombo, Sri Lanka	31/07 Chittagong, Bangladesh	12	17	17	-
<i>Leg 3.3 - Pelagic resources of Bangladesh</i>	2/08 Chittagong, Bangladesh	17/08 Chittagong, Bangladesh	15	19	19	-
<i>Leg 3.4 Eggs and Larvae Myanmar</i>	24/08 Yangon, Myanmar	11/09 Yangon, Myanmar	18	20	15	5
<i>Leg 3.4,2 Myanmar</i>	14/09 Yangon, Myanmar	29/09 Kawthuang, Myanmar	15	20	16	4
<i>Leg 3.5 - Deep sea resources of Thailand</i>	01/10 Phuket, Thailand	15 Phuket, Thailand	15	19	13	6

It should be noted that the Nansen Programme also conducted surveys in the ABNJs of the Indian Ocean in previous Programme phases, i.e. on the Mascarene Bank (8 October – 27 November 2008) and in the Southern Indian Ocean Seamounts (12th November – 19th December 2009).

- **Post-survey meetings**

The main purpose of the post-survey meetings is to finalize the survey reports, discuss follow-up activities, including processing of the samples and data collected during the survey, review possible research projects, including deliverables to EAF-Nansen Programme and regional authorities and discuss needs for capacity development (as appropriate).

The post-survey meeting for the habitat survey on the Saya de Malha and Nazareth Banks took place in Port Louis, Mauritius on 3-6 September 2018, jointly with the Mauritius-Seychelles Joint Management Area Commission.

Scientists from Mauritius and the Seychelles, and experts from SIOFA member states, elaborated the research project proposal on Theme 7 “Habitats and geomorphology of the Mauritius and Seychelles’ Joint Management Area (Subarea of SIOFA)” with the main objective to enhance the scientific information on geomorphology and benthic habitats and benthic flora and fauna in the Joint Management Zone maintained by the Seychelles and Mauritius on the Mascarene Plateau.

- **Science plan implementation**

In the context of the post-survey meeting mentioned above, suggestions for specific research project proposals and partnerships for Theme 7 were formulated, including:

- Characterizing geomorphology and habitats of Saya de Malha.
- Bio-mineralization processes on the Saya de Malha Bank.
- Sediment particle size analysis and characterization and identification of INFAUNA ASSEMBLAGES.
- Morphological characterization of fish specimens collected from the Saya de Malha and Nazareth Banks
- Genetic identification of living resources
- Benthic and benthopelagic invertebrates and fish associated with slope habitats. -
- Assessing the ecology, diversity and characterization of targeted benthic flora and fauna within shallow waters of Saya de Malha and Nazareth Banks (video analysis)
- Characterization and diversity of corals and their health status on Saya de Malha and Nazareth Bks.
- Characterization and diversity of Gastropods and Bivalves.

These projects are expected to result in baseline documentation and accounts on the bathymetry, habitats and benthic megafauna and -fauna in representative subareas of the Mascarene Plateau.

Research efforts in the JMA are considered as contributions of the Western Indian Ocean countries to the Western Indian Ocean countries in the second International Indian Ocean Expedition - IIOE-2 (2015-2020).

- **Other relevant science-related activities**

In 2018, the EAF-Nansen Programme organized two workshops: one on ecosystem characterization (21-23 August 2018 in Rome), with the participation of experts from the SWIOFC region. The objective was to build a common approach to ecosystem characterization and the meeting resulted in a draft guide on ecosystem characterization in data poor regions. Another workshop on bottom habitat mapping took place on 4-6 December also in Rome, to explore the use and application of various bottom habitat mapping methods and techniques as well as modelling approaches in order to identify a suite of options for application in the EAF-Nansen Programme.

Outcome 2: Fisheries management institutions manage fisheries according to the EAF principles

The outputs under outcome 2 relate to technical support to improve fisheries management, encompassing policy, legal and operational management support, the collection and analysis of relevant fisheries data (including biological, ecological as well as social and economic data) and support to the development of science-based decision-making through the implementation of the ecosystem approach to fisheries (EAF) including the development of fisheries management plans using the EAF framework and support to setting up a functional fisheries management cycle.

The implementation of the Ecosystem Approach to Fisheries and supporting the management of fisheries on shared stocks are two key mutually reinforcing objectives of the EAF-Nansen Programme.

SIOFA members may be interested in work related to legal aspects whereby preliminary gap analyses were carried out in a number of countries using a legal assessment tool developed in the context of legislating for EAF.

In the Indian Ocean so far, under the current phase of the Programme, the focus of this component has been the development of a project in support of the implementation of Tanzania's small and medium pelagic fisheries management plan.

Also of possible interest to SIOFA, it should be noted that under the past programme phase several countries in the Western Indian Ocean were supported in the development of fisheries management plans within the framework of the Ecosystem Approach to Fisheries, i.e.:

- **Fisheries management plans prepared in the framework of the EAF-Nansen Project in the SIOFA area**

Comoros:

- Union des Comores, Direction Générale des Ressources Halieutiques, 2013. Plan d'aménagement de la pêche de poissons démersaux aux Comores

Mauritius:

- Ministry of Fisheries of Mauritius, Fisheries Management Division, 2012. Fisheries management plan for the shallow water demersal fish species of the Saya de Malha and Nazareth Banks

Seychelles:

- Seychelles Fishing Authority, 2013. Management plan for the artisanal and recreational demersal fisheries in the Seychelles (plan modified and completed through another process)

Outcome 3: Fisheries research and management institutions have appropriate human and organizational capacity to manage fisheries sustainably

The outputs under outcome 3 relate to capacity development across the thematic themes of the Programme, technical support to research and management institutions for gender mainstreaming in the Programme activities, and the establishment of a functional knowledge and information sharing mechanism.

A capacity development strategy has been developed and the preliminary assessment of potential priority areas for short-term capacity development is presented in Table 2.

Table 2: Proposed thematic areas for short term capacity development

Fisheries and Marine ecosystem research	Fisheries management
<ul style="list-style-type: none"> • Survey-related courses, e.g. <ul style="list-style-type: none"> ○ Survey design, planning, execution and reporting; ○ Cruise leaders course ○ Survey data management and analysis ○ Estimation of demersal fish biomass using the swept-area method • Fisheries acoustics <ul style="list-style-type: none"> ○ Estimation of pelagic fish biomass • Scientific instrumentation - functioning, maintenance and calibration • Environment data management and analysis (e.g. with software for CTD data, ADCP) • Analysis of bottom topography using multibeam • Introduction to ecosystem modelling • Use of C isotopes for ecosystem studies • Fish and invertebrate taxonomy • Laboratory analyses of plankton, benthos, sediments, nutrients and pollutants (including microplastics) • Use of R for marine ecosystem research • Ecosystem characterization • Stock assessment in data-poor fisheries • Stock identity using a holistic approach • Stock assessment <ul style="list-style-type: none"> ○ Preparation and analysis of fisheries data for stock assessment ○ Length-based data 	<ul style="list-style-type: none"> • EAF <ul style="list-style-type: none"> ○ Fisheries policy analysis ○ Fisheries management, tools and measures ○ Legislating for EAF ○ Fisheries Management Cycle ○ Use of Scientific information and advice for decision making • Social and economic dimensions of fisheries management <ul style="list-style-type: none"> ○ Collection and analysis of socioeconomic data ○ Socioeconomic indicators for management effectiveness ○ Gender analysis • Management of shared fish stocks • Fisheries statistics and sampling

So far, Indian Ocean countries have benefited mostly from on-the-job training through the survey work, however this is expected to change as the research work under the science plan is picking up and the technical training network becomes fully operational.

The Programme also has a gender strategy to provide a framework on how the Programme can assist fisheries research and management institutions for gender mainstreaming in the Programme activities.

SIOFA members are invited to visit the updated EAF-Nansen Programme website is available at <http://www.fao.org/in-action/eaf-nansen/en/>

4. 2019 WORKPLAN AND ACTIVITIES

In 2019 and likely in 2020, the survey work will focus on the Atlantic coast of Africa. Hence, the main activities for the SIOFA region in 2019 will be linked to the follow up to the research work from the 2018 surveys and the research projects identified in the science plan.

Also of interest to SIOFA, a survey of selected seamounts within the South East Atlantic Fisheries Organization Convention Area (SEAFO) was carried out in January 2019.

The EAF-Nansen Programme would be pleased to receive observation by SIOFA members on its work Programme including suggestions for partnerships relevant to the Programme's area of work.

While this note focuses on a subset of the Programme activities, further information can be found on the EAF-Nansen Programme webpage (<http://www.fao.org/in-action/eaf-nansen/en/>) or by contacting the Programme Coordinating Unit (PCU).



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