Technical assistance to The Gambia Maritime Administration for the development of a National Oil Spill Contingency Plan

Supported by

Activity report for PRCM

Fact finding and information gathering visit 9th – 17th June

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Submitted by

MARITTIMA

Note

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Executive Summary

This document summarises a visit made to The Gambia in June 2023 as part of The Project: Technical Assistance to The Gambia Maritime Administration for the development of a National Oil Spill Contingency Plan. The Project falls under the auspices of the GI-WACAF, a joint initiative between the IMO and IPIECA. In this instance, The Project has also been supported by the PRCM and this phase of activity was funded by them.

The objectives of the site visit were to gather information and data relevant to the development of a practicable National Oil Spill Contingency Plan (NOSCP). The objectives were achieved through field surveys and meetings with key government stakeholders. In all, we undertook two days of surveys on foot and by boat and met with 16 stakeholder entities.

Following the mission, the data and information will be compiled and used to draft a recommended outline of the NOSCP. A second site visit is planned for September where training will be provided to key entities on the fundamentals of oil spill response, following the standard format and content contained in the IMO OPRC Levels 1 and 2 training courses. The workshop will also aim to finalise operational components of the NOSCP.

A draft document for review will be submitted to GMA and GI-WACAF by the end of November and it is anticipated that the final outputs will be submitted by December, marking the end of The Project. Final outputs will include a recommended NOSCP draft for consideration and subsequent implementation by the Gambia Maritime Administration and a recommendations document intended to be used as a roadmap for future oil spill response preparedness activities for The Gambia to further develop implementation of the OPRC Convention.

1 Introduction

1.1 Preamble

The Global Initiative for West, Central and Southern Africa (GI WACAF) is a collaboration between the International Maritime Organisation (IMO) and IPIECA to enhance the capacity of partner countries to prepare for and respond to oil spills. The Initiative was launched in 2006 and is a partnership that includes 22 African Countries. Through its work, it contributes to the protection of the marine and coastal environment by working with Partner countries to develop and implement the following objectives with respect to oil spill preparedness and response:

1. Designation of authorities in charge
2. Ratification of relevant international Conventions
3. Development of a National Oil Spill Contingency Plan
4. Implementation of training and exercises
5. Procurement of national resources and equipment

The objectives are delivered through various activities, guided by and working in close collaboration with the national focal points for each Partner country of the GI WACAF. A critical element to the success of the Initiative is its cooperation and collaboration with other regional entities working towards marine environmental protection.

The Gambia, as GI WACAF Partner country, has made considerable progress in establishing the conditions necessary to respond to oil spills in recent years. This has involved establishing a competent authority to deal with marine incidents and subsequently ratifying and implementing relevant International Agreements (some of which remains in progress). In order to create the mechanisms for the protection and conservation of biodiversity and marine and coastal resources against oil pollution, the Republic of The Gambia has been working for several years to strengthen its national capacities by the development and drafting of a National Oil Spill Contingency Plan (NOSCP). In 2022, The Gambia formally requested assistance from the GI WACAF for continued development of its NOSCP, with an aim of having a document to be formally adopted as part of the implementation of the IMO 1990 Oil Spill Prevention and Response Convention (OPRC ’90) which was ratified in 2013.

This has resulted in a jointly funded Project between GI WACAF and PRCM: *Provision of Technical Assistance to The Gambia for development and implementation of the National Oil Spill Contingency Plan* (“The Gambia NOSCP Project, referred to as the Project hereafter*)*. The scope of the technical assistance is to ensure a case and country-specific approach to formulation of a response strategy and operational plan that complements existing national processes and frameworks. As such, the Project has been divided into the following general stages:

1. Information gathering and review
    a. Review existing national legal framework and identify synergies and potential conflicts with other legislation and the 2013 Marine Pollution Act.
    b. Collate data with regards to actual oil spill risks in country, an inventory of key environmental and socioeconomic sensitivities to develop oil spill scenarios to develop sensitivity maps and guide response strategy.

2. Response strategy development
    a. Where appropriate, model oil spill scenarios using open-source software in tandem with staff at The Gambia Maritime Administration.
    b. Through a series of workshops with relevant stakeholders, identify general response strategy.
    c. Develop a roadmap for future requirements to enact and maintain an appropriate level of response capacity and capability.
3. Collaboratively build operational plan to response
    a. Through stakeholder mapping and review of other complementary legislation (such as the National Disaster Management Act), determine response organisation and command and control structure.
    b. Review of existing resources and how these might best be deployed in a response.
    c. Determine tactical response options depending on sensitivities and source of oil spill.
    d. Provide training to key stakeholders in the fundamentals of oil spill response (using IMO OPRC model courses as foundation). This workshop is planned for September 2023.

Anticipated final outputs of this project will be:

- **Guidance document:** Practical Recommendations to assist The Gambia in finalising their NOSCP. Contents will reflect the structure of a NOSCP whilst taking into account national processes.
- **Gap analysis and roadmap**: Recommendations for future development of and activities relating to national preparedness for response to oil spills.

This document will summarise the activities undertaken, and progress made with respect to the first on-site visit as part of the Project. This component of the project was funded by the PRCM and it is anticipated that the outputs will not only provide valuable data contributing to its overall organisational goals, but will be invaluable in the development of The Gambia's NOSCP which would meet PRCM's wider objectives in the protection of marine and coastal resources and their stewardship as well as obligations of The Gambia in the implementation of OPRC '90.

Under the 2013 Marine Pollution Act, The Gambian Maritime Administration (GMA) is the competent authority with regards to responding to accidental releases of oil in the marine environment. In this capacity GMA is the Focal Point for IMO and GI WACAF related activities.

1.2 Mission purpose and objectives

Between 9th and 16th June 2023, the GI WACAF project coordinator and Marittima's technical consultant were in The Gambia as part of the joint GI WACAF-PRCM Project to provide technical assistance to The Gambia in the development of their National Oil Spill Contingency Plan (NOSCP).

This was the first of two visits planned under the scope of the Project, and it is anticipated that the second visit will take place in September 2023.

The visit in June was intended as an initial fact-finding mission to meet relevant stakeholders, request necessary data and documents from key stakeholders and become familiar with existing emergency response processes and oil spill response-related capacity. A field-based component of the Mission was intended to capture an overview of key environmental and socioeconomic sensitivities, capture an operationally-relevant snapshot and other context-specific information.

The list of stakeholders consulted during the visit is provided in Table 1.

Agency/Entity	Acronym	Description of role
Gambia Maritime Administration	GMA	Designated competent authority responsible for preparedness and response to oil spills. Has the responsibility for developing and maintaining the NOSCP
National Disaster Management Agency	NDMA	Custodian of the NOSCP and responsible for coordinating any updates, amendments and associated training and exercises.
National Environment Agency	NEA	Dual role: technical adviser (environmental impact mitigation and assessment and regulator (waste management permits)
Department of Parks and Wildlife Management	DPWM	Technical adviser and operational component in terms of monitoring protected sites and species for extent of contamination and impact mitigation and assessment.
Department of Fisheries	DoFish	Dual role: technical adviser in mitigation of impact and assessment of damages to fisheries. Regulator if fishing closures required.
Petroleum Commission	PC	Regulator for offshore activities and
Public Utilities Regulatory Authority	PURA	Enforces and ensures compliance requirements of downstream facilities as set out in the various Petroleum Acts in terms preparedness for handling emergencies
The Gambian Navy	-	Responsible for responding to oil spills at sea, under direction of the GMA.
Gambia Port Authority	GPA	Responsible for responding to Tier 1 oil spill and/or oil spills under their jurisdiction. Also maintains current oil spill response equipment at the Port of Banjul.
Gambia Tourism Board	GTB	Government agency responsible for managing risk to tourism and any tourism related claims. Will need to be kept informed in the event of an oil spill.

Gambia Ferry Service	GFS	None of their ferries are fuelled by persistent oil. Nonetheless, they pose a risk of small spills of MDO. More importantly, the ferries between Banjul and Barra represent a critical piece of infrastructure that could be disrupted in the event of an oil spill.
Fire and Rescue Services	-	Involved in coordination and response of shoreline oiling.
Gambia Petroleum	GP	Responsible for managing the pipeline and storage facility handling up to 42,000 MT of persistent oil (HFO) annually. Are required to handle Tier 1 response in the event of a spill.
General Petroleum Services	GPS	They will need to be informed in the event of a spill and potentially consulted. However, it should be noted that GPS does not handle persistent oils
Local government councils (City, Municipal and Area)	-	Banjul City Council, Brikama Municipal Council and Kanifig Council likely first on the scene. Need to integrate information flow to and from these levels with central government.
Gambia Environmental Alliance	GEA	NGO. They will need to be updated in the event of an oil spill. If The Gambia chooses to allow for and manage volunteers as part of the response plan, this body comprised of an alliance of NGOs would likely be the supervisory body.

A summary of the aims of the visit in terms of meeting the objectives of the project are summarised in Table 2.

NOSCP component	Description of aims
National legal framework	Compile all relevant national legislation and understand how these complement or interfere with the 2013 Marine Pollution Act. Particularly relevant for determining Roles and Responsibilities.
Roles and responsibilities and Command and Control	Determine stakeholder roles, become informed of relevant national legal framework that impacts this, understand how other agencies such as the Navy, Fire Service and National Disaster Management Agency (NDMA) currently respond to emergencies
Oil spill risk assessment	Collect data from potential sources of an oil spill, review previous experiences with oil spills

Environmental and Socioeconomic sensitivities	Joint field surveys with national stakeholders; mangroves, main fish landing sites, Port of Banjul and pipelines at Mandinaring. Meetings with agencies managing Marine Protected Areas, fisheries and environmental regulator
Operations	Visits to: Gambia Petroleum facility to understand existing preparedness, experience with previous incidents and operational opportunities for development on-site. Navy to understand available response assets, command and control processes and see their operations command centre. Port of Banjul: Review available oil spill response equipment, obtain and overview on realistic opportunities to maximise existing resources and review waste management constraints and opportunities.
Administration, logistics and documentation	Discussion with head of finance at The Gambia Maritime Administration regarding management of claims and record-keeping. Question of whether costs and claim record keeping to be administered by NDMA or GMA.
IT	Discussions with various agencies on current GIS capacity and capabilities. Assess availability of resources at various agencies.

1.3 Summary of activities

Day	Activity	Description
Sat, 10th June	AM: Arrive BJL PM: Coastline survey	Objective to understand the nature and layout of tourism, fisheries, shoreline type, shoreline accessibility and other relevant points of interest. Points of interest recorded by GPS for later mapping. Accompanied by With representatives from GMA and NDMA.
Sun, 11th June	AM: coastline survey cont. PM: boat survey	Objective: to gain an overview of ecological and economic layout of estuary and include limited mapping of shoreline by type. Points of interest (where accessible) to be recorded by GPS
Mon, 12th June	AM: Boat survey cont. PM: Meeting	Meeting with DWPM

Tue, 13th June	All Day: Meetings	Meeting with the following stakeholders to understand each role and responsibility, identify relevant legislation and request data and documents important for development of the NOSCP: NDMA, NEA, PURA, PC, GTB
Wed, 14th June	All Day: meetings	Meeting with the following stakeholders: The Gambian Navy , GPA, GFS, Fire and Rescue Service, DoFish Meeting with GPA was followed by a tour of the Port and inspection of warehouse where oil spill response equipment is currently stored.
Thu, 14th June	All Day: meetings	Meetings with GMA board and key senior personnel. Presentation for Local Government Councils and the NGO, GEA.
Friday, 15th June	AM: Site visit to GP and GPS PM: Depart for BJL airport	Tour of oil storage facilities in Mandinaring with the objective to understand internal processes, current levels of preparedness and understand issues associated with the 2022 pipeline spill.

2 Report of activities

2.1 Field surveys

Based on consultation with stakeholders and desktop research prior to the visit, the highest priority in terms of developing preparedness for an oil spill was considered to be the Banjul Port to Mandinaring portion of the River Gambia estuary. This area is characterised by high density marine traffic, with Banjul being the only deepwater port in The Gambia. Furthermore, two offshore pipelines located at Mandinaring also receive hydrocarbons from discharging tankers. Given that only small vessels go upriver beyond this point, there are no potential maritime oil spill sources upriver from this point (although areas upriver could be affected by a spill in the Port of Banjul or at Mandinaring). As such, the main focus of the final NOSCP will likely be limited to Western Coast and North Bank Regions, with a particular focus on Banjul City Council, Kanifig Municipal Council and Brikama Area Council.

A ship-sourced spill affecting the coastline of The Gambia was considered, based on desktop review to be less likely to pose a significant spill risk, however the presence of multiple, critical fisheries ports along the coast warranted its inclusion as a focus for the visits. Furthermore, the Sangomar oil well in Senegal, located approximately 60 NM from the entrance of the Port of Banjul will also be assessed as a potential source of spill, further warranting focus on the coastline during the site visit as well as within the estuary.

Between 10th and 12th June, Marittima along with representatives from the GI WACAF, GMA and NDMA undertook coastal and estuarine surveys by foot and boat. A reference map showing the extent of these surveys is provided in Figure 1. A summary of the sites, along with their geographic coordinates is provided in Appendix 1.

In order to make the best use of the time available, the following were prioritised:

- From a socioeconomic sensitivities perspective, visiting the primary fish landing sites of The Gambia was considered to be important given the importance of fishing to as an economic activity.
- While it was not possible to walk the full extent of the coastline to map the shoreline types in the time available, for the purposes of designating environmental sensitivity indices to the coastline, any variance in shoreline type at various points along the route were recorded The intent was to use these points as ground-truthing for shoreline categorisation based on previous work by BP and satellite imagery. Accurately recording the presence and extent of protected areas was not a priority during the time available, given that the most accurate information on these will be based on input from the appropriate government authority (DPWM).
- Two estuarine fishing villages were visited to provide a snapshot, although due to logistical constraints and remoteness it was not possible to visit all at-risk villages on the estuary.

A review of the sensitivities and oil spill risks in the context of further developing the NOSCP is provided in Section 3.1.1.

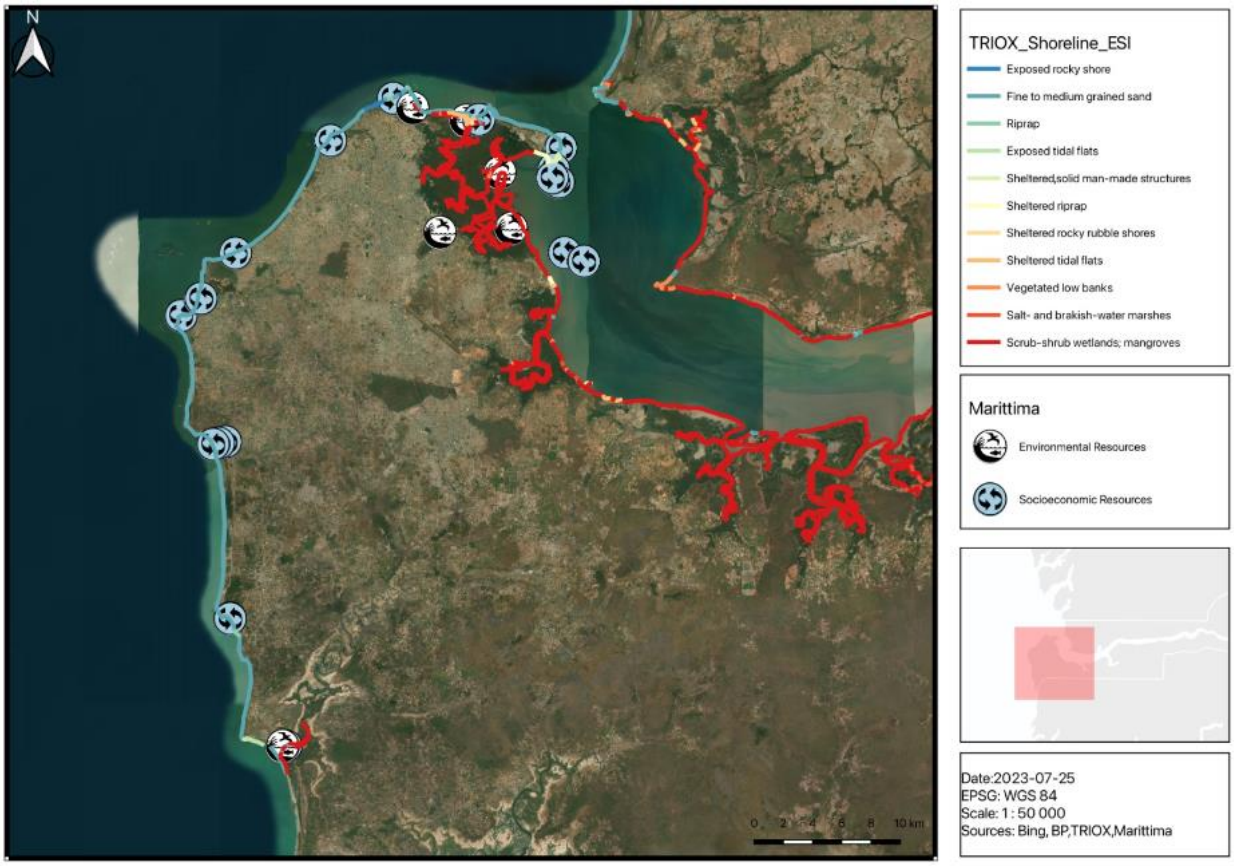

Figure 1 Reference map summarising field-surveys in June 2023.

2.2 Meetings

As highlighted in Table 1, we met with 16 stakeholders during the site visit. Government entities on this list are also part of the Technical Committee charged with assisting the development of the NOSCP. Meeting stakeholders at their offices provided the opportunity to understand what data and information to support development of the NOSCP might be available.

The primary objectives of these meetings were to:

1. Introduce the process for developing a NOSCP;
2. Answer any questions;
3. Identify harmonies and constraints in developing oil spill response preparedness and capacity; in The Gambia, from the perspective of the stakeholders; and,
4. Request data, information and documents critical to development of a practicable NOSCP.

A list of the documents and types of information requested from the stakeholders during the meetings is provided in Appendix 2. At the time of writing, documents received are marked as such in the final column (date received).

3 Discussion – observations relevant for NOSCP

3.1 Risk assessment – sensitivities

Characterisation of features such as shoreline types, sites used by sensitive species, habitats and protected areas as well as human-use value is an important element for undertaking realistic and site-appropriate oil spill risk assessments. The sensitivity (impact if oiled) and vulnerability (probability of being oiled) of important environmental and socioeconomic resources will shape the strategic objectives of a NOSCP and determine operational factors such as identifying priority areas and selecting the most appropriate oil spill response techniques for a given area.

For the purposes of oil spill contingency planning, shoreline types are mapped according to the standardised Environmental Sensitivity Index (ESI) developed by the US National Oceanographic and Atmospheric Administration (NOAA). The Index is intended to provide a concise summary of coastal resources at risk if an oil spill occurs. The index is made up of three components:

1. Shoreline classifications – ranked according to a scale relating to sensitivity, how likely oil is likely to persist and ease of cleanup. These last two are based on the energy at the shore, substrate type and accessibility.
2. Biological resources – this includes oil-sensitive animals and rare species, as well as habitats sensitive to oil or used by organisms that are.
3. Human-use resources – specific areas that have additional sensitivity and value because of their use by people – fisheries sites, water intakes for critical industrial infrastructure, archaeological and protected parks and local ports, marinas, and access points.

The NOSCP to be developed by future activities as part of this project will utilise data provided by BP, who have previously developed a comprehensive ESI map for The Gambia. This project however was completed remotely and to ensure the maps included in the NOSCP are as accurate as possible, these data will be supplemented by those held by various agencies of The Gambian government, and the site surveys were important for providing context and detail to the data contained within the map.

3.1.1 Shoreline classification

From an oil spill planning and response perspective, the diversity of shoreline types is fairly low in The Gambia, which simplifies response planning and options. Table 3 provides a summary of shoreline classification as per the NOAA ESI.

Table 1 Summary of shoreline ESI categories.

ESI Class	ESI Description (simplified)	Summary of oil behaviour and response recommendation
ESI 1	**Exposed rocky shores / banks cliffs**	Most oil removed by natural processes over time
ESI 2	**Exposed rocky platforms, bedrock shores**	Most oil removed by natural processes over time
ESI 3	**Fine grained sand beaches (wave exposed), eroding banks**	As a consequence of sedimentation oil may sink and/or be buried depending on sand grain size. Oil may be removed mechanically, manual or naturally.
ESI 4	**Coarse grained sand beaches (wave exposed)**	Because of sedimentation oil may sink and/or be buried depending on sand grain size. Oil may be removed mechanically, manual or naturally.
ESI 6	**Gravel beaches (wave exposed)**	Oil may penetrate deeper into the substrate and be buried. Depending on wave energy, oil may persist for long time (>months) if not removed.
ESI 7	**Exposed tidal flats**	Oil is likely to deposit at the surface.
ESI 8	**Sheltered scarps / rocky shores / solid man-made structures, riprap**	Oil is likely to deposit at the surface. Oil will persist for long time if not removed manually or mechanically.
ESI 9	**Sheltered tidal flats / sand and mud flats**	Oil deposits at the surface and penetrates into the substrate. Cleaning will be very challenging, protection of resources recommended if possible.
ESI 10	**Marshes, swamps, wetlands, mangroves**	Most sensitive coastal environment. Oil may persist for many years despite cleaning efforts. Protection of resources recommended if possible.

The sea-facing coastline of The Gambia extends for approximately 56 km south of the river (West coast) and 13 km north of it. Based on surveys at various points along the south coast, the shoreline type as per the ESI classification is fairly consistent: primarily category 4, coarse grained sand beaches with occasional category 7, exposed tidal flats. A limited extent of rocky cliffs (category 1A) are present on the northernmost part of the southern coastline.

On the estuarine side, the shoreline is primarily comprised of mangroves (category 10F), with some marshes and few access points (jetties) or sheltered, solid, man-made structures (category 8B) in the area around the Port of Banjul and Mandinaring. From an oil spill planning and response perspective, the relevant characteristics of these shorelines are summarised in Table 4.

Table 2 ESI categories found in The Gambia.

1 Exposed, rocky shores Sandstone cliffs exposed to large waves which will tend to deflect any oil to other, more sheltered locations or back offshore. Any oil that does strand will be removed by natural processes. Oil will tend to band at the high water mark or on the splash zone. Generally, limited or no clean-up necessary or possible.	 Example: sandstone cliffs around Bakau fishing port.
4 Coarse-grained sand beaches Substrate is permeable with oil penetration of up to 25 cm possible. Intermediate slope (between 5 and 15 degrees). High rate of sediment mobility, leading to potential for rapid burial and erosion of oil. Soft sediment and low trafficability (difficult to walk on). Relatively low densities of infauna.	 Example: medium -coarse grained sand on eroding beach.
7- Exposed tidal flats Oil does not readily adhere to or penetrate the compact, water-saturated sediments. Instead, oil is pushed across surface to accumulate at high tide mark. If sand bars and burrows dry out during low tide, oil may penetrate. Clean-up is a challenge due to the potential for mixing oil deeper into sediment when high volumes of foot traffic (or response traffic) present.	 The tidal flats around Gunjur are important for migratory European bird species as well as livestock.

8- Sheltered scarps, rocky shores and solid man-made structures Sheltered from wave energy or strong tidal currents. Substrate is hard, often covered by encrusting organisms and algae. Rubble structures may trap oil within the spaces underneath and can be problematic to remove. Tend to be of less ecological concern than other sites. Due to the high economic value-use of these areas, may require a higher degree of cleaning to remove traces of oil.	 Example: Port of Banjul area
10 Marshes, swamps, wetlands, mangroves Substrate is flat and generally muddy. Mangroves are one of the most sensitive habitats because of their high ecological value and use, difficulty to clean and the potential for long term impacts to be caused, both by the spilled oil and any response measures undertaken in these areas. Oil will tend to accumulate at the high water line and will readily adhere to vegetation. Heavy crude oils and HFO tend not to penetrate substrate but can pool on surface or in root cavities and any animal burrows. Response activities can cause further damage and therefore normally, very minimal manual cleaning of bulk oil is recommended in the most sheltered locations where oil will accumulate at natural collection points.	  Example: Kartong and extensive coverage within estuary. According to UNESCO, mangrove coverage in The Gambia extends to 581 km^2.

3.1.2 Environmental sensitivities

The most notable aspect from the surveys was the extent and health of undisturbed mangrove networks within the estuary in the River Gambia. Dominant species appeared to belong to the *Rhizophora* genus, with a much lower abundance of *Avicennia.* The ratio of mangrove coverage to land was notably high as has been well-reported in literature. Given the mangrove systems in the River Gambia and a the southern Senegalese border are vital for supporting fisheries of both the Gambia and Senegal, impacts to mangroves would be the primary concern in the event of an oil spill. Community-based replanting efforts were evident and appeared to be well-organised. These

initiatives would likely be an important source of support in the aftermath of an oil spill. Based on the most likely sources of a significant oil spill (see Section 3.1.2), the Tanbi Wetlands National Park (TWNP) was the focus of our surveys and would represent the most vulnerable area. TWNP fronts the ocean to the north and the Gambia River to the east and covers an area of 6 304 ha. The TWNP functions as a coastal stabilizer and offers a spawning and nursing ground for many fish species.

Along the marine coastline, The Tanji River Reserve covers an area of 612 ha and is located close to the largest coastal fish landing site in The Gambia in Tanji. The reserve was established primarily for its ornithological importance (295 species from 61 different families). Reserve boundary encloses the tidal, saline reaches of the small Tanji river, which is bordered by 2 km^2 of low mangrove forest, saltmarsh and mudflats. Longshore drift creates a shifting channel for the river as it reaches the ocean and is blocked by a sand beach parallel to the land. This has also created several small lagoons between the river's mouth and Cape Point. The point is the landward limit of a lateritic outcrop which reappears 2 km offshore to form the tiny Bijol Islands, which are included in the reserve. The two unstable islands are accumulations of sand trapped by laterite reefs. They were formerly lightly wooded, disappeared in the 1960s and have gradually reformed since then. The main island is now vegetated with the creeping halophytes *Ipomoea pes-caprae* and *Sesuvium portulacastrum*. Bijols Island is a significant area for birds and marine mammals. Birds found during nesting periods include Royal Tern, Caspian Tern, and Grey Headed Gull. Western Reef Heron, Long Tail Cormorant, Great White Pelican, Pink Backed Pelican etc. Thirty-four species of Raptor have been recorded. The surrounding waters are an important feeding ground for endangered Green Turtles (*Chelonia mydas)*, which breed on both the mainland and on the Bijol Islands. In addition, the endangered Mediterranean Monk Seal (*Monachus monachus*) has also been reported. Furthermore, there is a range of terrestrial mammals that occur in the area. As such, the Tanji River Reserve is considered to represent the most sensitive coastal location in the event of a spill.

3.1.3 Socioeconomic sensitivities

3.1.3.1 Fisheries - Western Coast Region (WCR)

The Gambia is comprised of both industrial and artisanal fisheries. The industrial sector is comprised primarily of offshore, foreign vessels. Given that vessels >250 GRT are not permitted to fish within 12 NM of the coast, they are not considered to be a priority for the purposes of the development of the NOSCP. On the other hand, the artisanal fisheries sector in The Gambia is highly diverse, incorporating marine, estuarine and freshwater fishing operations. An oil spill has the potential to impact a large number of people who depend on fisheries either directly or indirectly and based on observations during the site visit, is considered to be one of the most important socio-economic risks of an oil spill. For the purposes of the current Project, the focus will remain on marine and estuarine artisanal fisheries.

Six dedicated fish landing sites were visited along the marine coast of the WCR, with Tanji being the most important in The Gambia in terms of landing volumes (Figure 2). With the exception of Bakau, these landing sites do not have dedicated piers, but rather occur along the beach outside the towns, where landed fish are processed, sold and transported. In terms of vessels, along the coast, vessels where all observed to be canoes with outboard engines. A high diversity of fishing gears was observed

to be in use, including traps/pots, hand lines, gill-nets and seine nets. Similarly, catch composition was varied with multiple demersal and pelagic species as well as cephlapods, crustaceans and other molluscs prominent in catches.

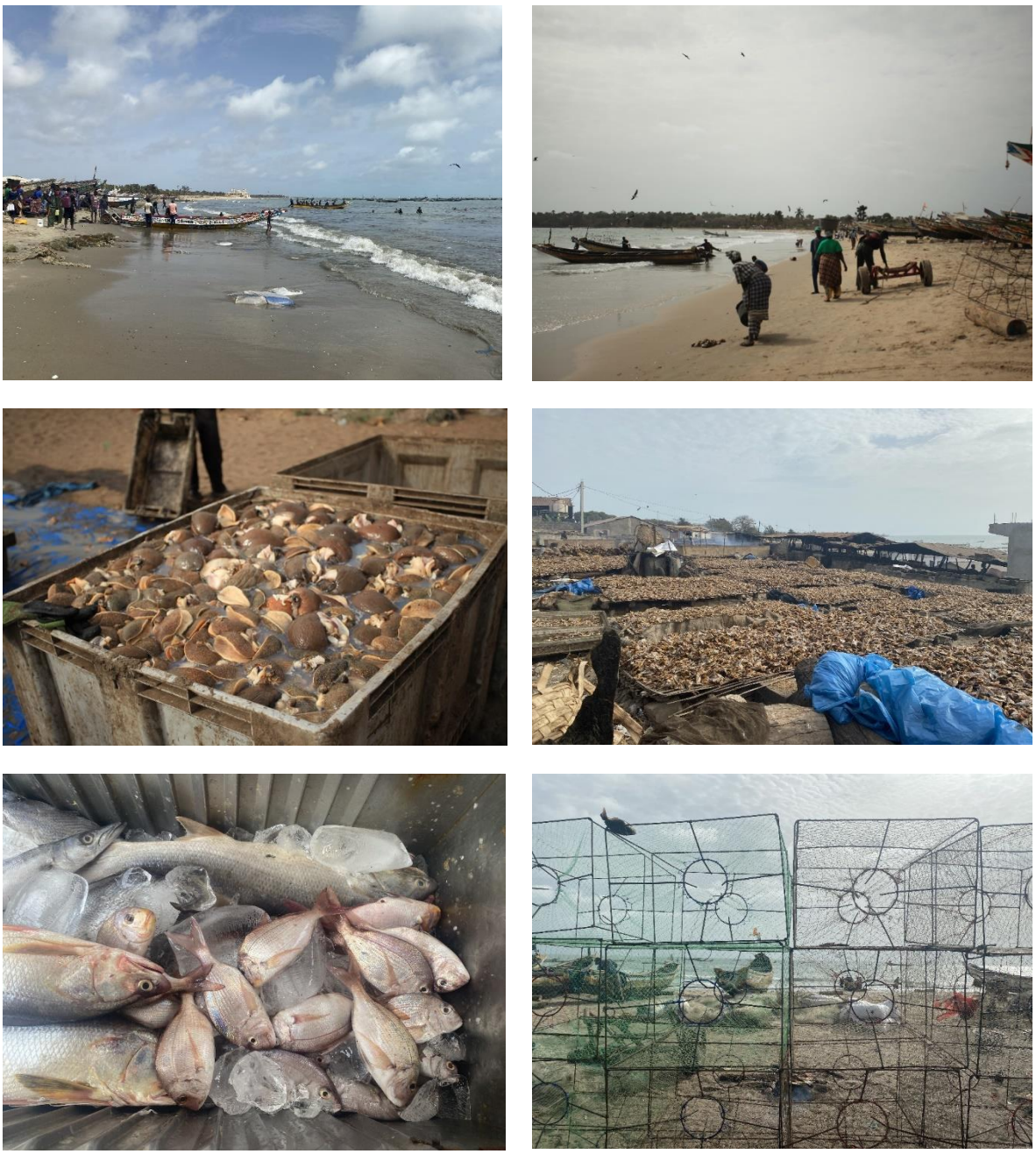

Figure 2 Selected images from visits to coastal fish landing sites.

At larger sites there are dedicated processing facilities such as drying, smoking and fish-meal plants. Ice manufacturing facilities were also present at some of the sites.

Along the estuarine coast, fisheries were dominated by shrimp traps and oyster cultivation. Small numbers of various marine and brackish-water fish species were also observed at landing sites in the villages. Canoes were a combination of mechanised and unmechanised dug-out canoes, smaller than

those operating at the marine coast. Landing sites were in villages, where oysters and cockles (the latter in Kartong only) were processed upon landing ashore.

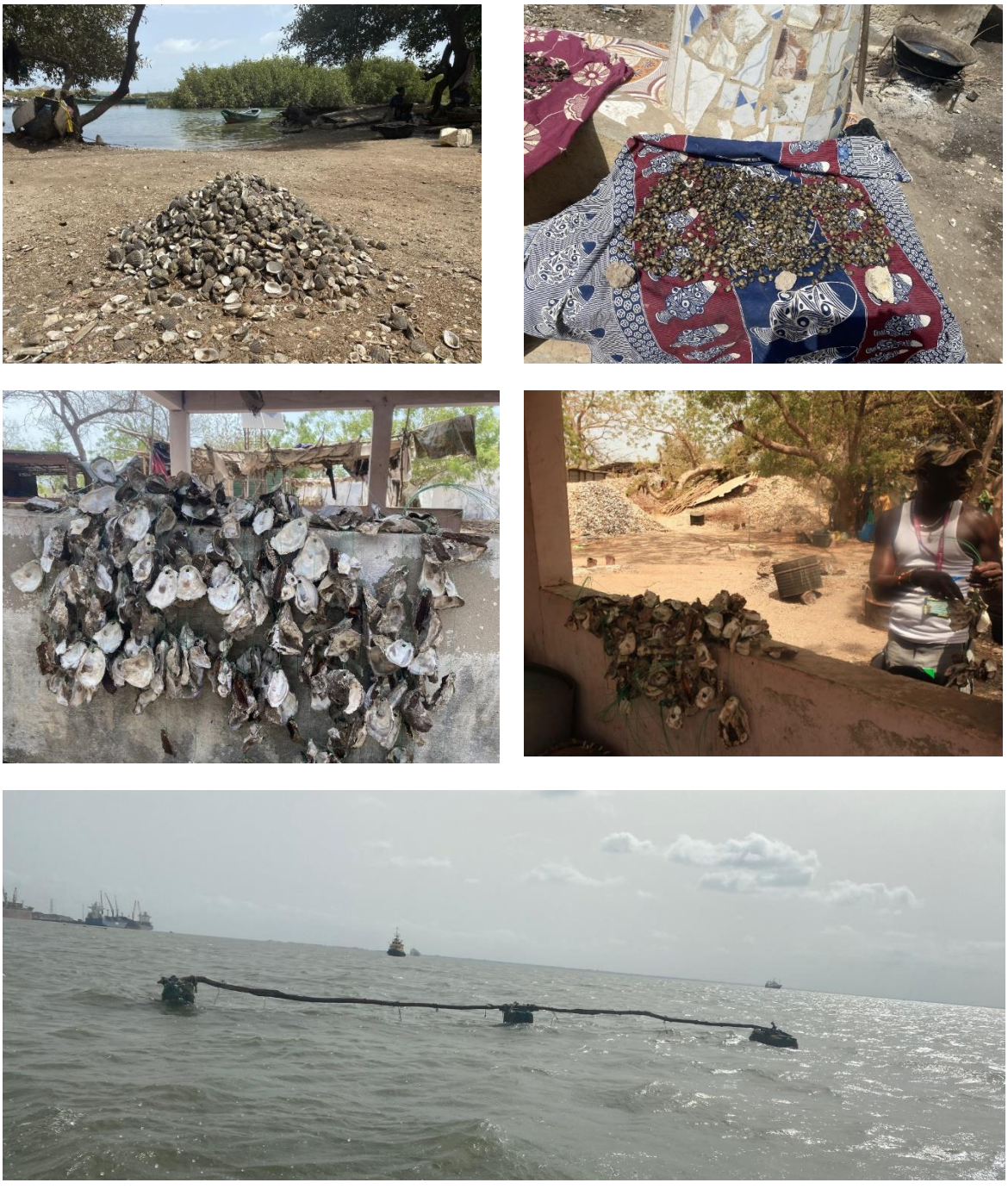

Figure 3 Fisheries characteristic of the estuarine-coastline.

The nature and characteristics of fisheries in a given area are an important consideration in the development of oil spill contingency plans as these will influence management measures and response options as well as influencing where resources should be directed and staged from. The very different characteristics between fisheries on the marine and estuarine coast will be taken into consideration as the NOSCP response recommendations are developed further.

3.1.3.2 Tourism

Tourism was observed to be concentrated primarily in the Senegambia area. During a meeting with the GTB, they confirmed that this had been the focus of the tourism development plan, designated as Zone 1. While occasional tourist sites and accommodation were observed further south beyond Senegambia, these became increasingly infrequent further south along the coast. Hotels and resorts around the Senegambia area are primarily large-scale hotels, interspersed with smaller family-owned hotels and bed and breakfasts. The beaches in this area are popular with both tourists and locals, with an oil spill resulting in a high impact from an amenity-use perspective. Although the probability of a significant spill is lower here than in the estuary, the potential for high impacts from an economic loss and property damage perspective is considered to be the greatest along here.

On the estuary-facing shoreline, the main tourism attraction is birdwatching in the mangroves. There are restaurants, sheltered anchorage for foreign yachts and low-density eco-tourism lodges interspersed irregularly. These businesses are run by individuals or small businesses and would likely face a high impact from any damage to property or loss of business resulting from an oil spill.

3.1.3.3 Heavy industry

With the exception of sand mines and fish meal processing plants along the coast, heavy industry appears to be focussed on the Banjul area, along the main road linking the mainland with Banjul and Kanifing. The concentration of industry in one main location is a positive when considered from a response planning perspective. When fisheries, tourism and industry share the same area, there will be different priorities which can result in conflicts in terms of the most appropriate response options and techniques.

3.2 Risk assessment – potential oil spill sources

A key objective of the site visit was to complement data and background research with an understanding of in-country, realistic oil spill sources. Coupled with sensitivities, this will enable the development of appropriate scenarios in the risk assessment to facilitate the development of a tailored response plan.

Previous experiences of oil spills in an area of focus provide invaluable information on the way environments and people in contaminated areas are impacted and can act as markers of higher probability scenarios. Crucially, this enables the identification of valuable lessons learned for planning a response to future incidents. Previous incidents therefore, are an important component of oil spill risk assessments for a given area or Country.

Potential sources of spills of persistent oil have been identified and described below.

3.2.1 Shipping

3.2.1.1 Transient

Marine traffic transiting The Gambia's EEZ is considered to be fairly moderate when compared to other parts of the World. Furthermore, the risk of spills occurring while vessels are underway is not as high as when vessels are manoeuvring. Nonetheless, a loss of power or other incident may result in an oil spill from these vessels which would affect the marine coast of The Gambia and will therefore be considered in the risk assessment.

3.2.1.2 Port of Banjul

The Port of Banjul is the?main maritime port in the Gambia. It is the gateway for the country's export and import trade accounting for over 80% of total international. The port handles breakbulk, containerised and liquid bulk cargoes, fishing vessels as well as small cruise vessels. The port is expected be modernised and its capacity improved through the Banjul 4th Expansion Project. In addition to trading cargo vessels, there is a stationary floating power plant, anchored off the coast of Banjul. The Karadeniz Powership KORAY BEY provides 36 MW of power to The Gambia's national grid using HFO.

There are several historical wrecks within the Banjul Port area, although these appear to be well-charted. Nonetheless, the possibility of a shipping related incident within the port as a potential oil spill source remains and will be considered in the NOSCP.

3.2.2 Oil storage facilities and pipelines

There are two oil storage facilities at Mandinaring, GP and GPS, each receiving cargo from tankers via pipelines situated approximately 1.5 km offshore. GPS does not receive persistent oil cargos and therefore will not be a further focus in the NOSCP. In 2022, the GP facility received approximately 43,000 MT of HFO.

It should be noted that during the survey in June, both facilities were observed to be operating to a very high standard, and it was reported that the following incident at GP was the first in 20 years of operations and their pipelines are fitted with breakaway couplings in the event of pipeline failure, which would limit the spill to approximately 70 MT as with the 2022 spill described below.

On 28th May 2022, approximately 70 MT of HFO were spilled while a vessel was discharging cargo at the offshore pipeline belonging to GP. Oil contamination reportedly affected areas up to Pirang, 28 km from the source of the spill. Figure 4 shows analysis of satellite imagery undertaken by UNitar. The yellow shows probable distribution of oil, but given it is based on processing of satellite images, it is not a reflection of the actual contamination that occurred. Nonetheless, it does demonstrate the potential trajectory of an oil spill from the pipeline. Consistent with reports from stakeholders, the image shows oil in the creeks leading to some of the villages and these would be where the worst effects of a spill would occur.

Figure 4 Probable extent of contamination of the 2022 pipeline spill based on analysis of satellite imagery.

Given complex tidal currents and speeds, containment and recovery of oil using booms in this location would be largely ineffective and it is likely that the NOSCP recommendations will include measures for protective booming of the most vulnerable fishing villages and locations.

Based on media articles, the response seems to have been well-executed with a focus on manual recovery of bulk oil. However, based on the meetings with stakeholders, the response to the incident clearly provided some key take away lessons on how roles and responsibilities need to be better defined, as well as the potential for determining better techniques for clean-up and documenting damages incurred by fishers. Most stakeholders also agreed that the incident highlighted the strengths in response execution from a coordination of operations and liaison with local government.

From the vessel side, maximum cargo volumes of vessels received in 2023 were approximately 10,000 MT. Although highly unlikely that an incident resulting in a total and catastrophic loss of cargo would occur in this location, from a risk assessment perspective, this has been considered the highest possible risk in The Gambia from a magnitude of impacts perspective.

3.2.3 Offshore oil and gas production

There are eight offshore Petroleum Exploration & Production blocks in the Gambia namely A1, A2, A3, A4, A5, A6, A0 and UD1 (total size 14,208 km^2), of which three are active (A2, A4, A5) and no exploration well drilling is expected within the next few years.

Another potential source of a spill is the Sangomar field (formerly the SNE field), containing both oil and gas. It is located at 13° 43' N, 017° 36' W approximately 100 km northwest of Banjul and 100 km

south of Dakar. Work on the Sangomar Field commenced in early 2020 and first oil production is targeted in 2024. It is anticipated to produce 100,000 barrels of crude oil per day. Given its proximity to The Gambia's EEZ and coastline, this will be considered during the risk assessment as a potential oil spill source in The Gambia. Production in Senegal will also mean that an important future preparedness activity will be for The Gambia to consider an oil spill dispersant policy, as well as bilateral cooperation agreements with Senegal.

3.3 Roles and responsibilities / response organisation

During meetings, a focus of the discussions was how a response to an oil spill in The Gambia should be effected; where overall command and control lies, as well as the responsibilities of individual institutions. Some areas of duplication or where there is a lack of clarity in the specific roles and responsibilities were frequently highlighted by stakeholders. The response organisation and structure to be included in the NOSCP will be finalised during the second site visit, planned for September.

NDMA have developed good systems for response to nationally significant disasters and the case study of how recent flooding at a national scale was handled by NDMA is relevant for the development of oil spill response preparedness. A representative has been requested to present this study for the workshop planned in September as part of the response organisation module.

Many institutions identified a degree of overlap between the various roles and activities each institution would be responsible for in the event of an oil spill. The GP pipeline spill in 2022 served as an important lesson for identifying these issues. Whereas the Marine Pollution Act of 2013 is the one that places overall authority with GMA, there are several other Acts and instruments in force nationally which may also be relevant in a response, and therefore part of the project activities before the next visit will be to review all relevant national legislation to identify any potential inconsistencies.

Based on discussions so far, it is anticipated that GMA will have overall authority in the event of an incident, acting as Incident Commander but NDMA will remain the coordinator of the response, given their role in this aspect for all national disasters. From an operational perspective, the roles of the Navy, GPA and GP also require further clarification, which will be undertaken through a dedicated workshop during the second site-visit.

3.4 Existing response capacity and infrastructure

NDMA's well developed response system for dealing with disasters has already been discussed. This experience and preparedness is a useful asset for developing preparedness to manage and coordinate oil spills. Furthermore, despite having a small coastline, The Gambia's Navy is well organised and structured, with experienced personnel and their command and control and communications SOPs will also be taken into account as the NOSCP project progresses.

In terms of existing response equipment, during a tour of Banjul Port, we learned that it does own a stockpile of oil spill response equipment (several reels of inflatable and fence boom as well as at least one skimmer) which has never been opened or used (Figure 5). During our meeting with GPA, we

discussed plans for the port expansion and they highlighted that developing a dedicated response warehouse/facility was a priority. Development of a practical storage and maintenance system for this equipment will be a consideration in the recommendations emerging from this project. It will also be important to open the equipment to identify the specifications of the boom as most boxes were unaccompanied by bills or descriptions. This stockpile will make a positive start to any national stockpile requirements identified as the project progresses.

Figure 5 Some of the equipment stockpile currently housed in Banjul Port.

Notwithstanding the above, given the most likely source of a significant oil spill is on the estuarine coast, variable and unpredictable currents, extensive mangrove coverage and the presence of extensive, small-scale oyster and shrimp farming will likely mean that primary response recommendations included in the NOSCP will focus on manual techniques and as such an organised response workforce and good waste management (storage and treatment) strategies will be the key capacity requirement for dealing with oil spills in The Gambia.

4 Concluding remarks

The zoned nature of environmental characteristics, fisheries, tourism and industry in The Gambia will mean that different approaches are required in different areas. When compared to many other countries, these "zones" are well delineated which will facilitate implementing a bespoke set of response recommendations, dependent on the area affected by a spill. Broadly speaking, based on the visit, it's possible to breakdown response relevant environmental and socioeconomic conditions into four response groups:

1. Marine – fisheries dominated
2. Marine – tourism dominated
3. Industrial (Banjul area)
4. Estuarine

A second important observation was that although The Gambia does not have much experience in responding to oil spills, the current focus on building up adequate response capabilities will greatly be assisted by the well-defined system for responding to national disasters, and where considerable experience already exists. A strong Navy will also facilitate building of capability to respond to oil spills at sea or in the estuary.

Throughout the project so far, there has been very active input from and good communication between stakeholders, and this ongoing proactivity will help ensure recommendations for the NOSCP document are practicable and relevant.

The next steps associated with this project are:

- Following the site visit, the information requested from various agencies will be compiled and reviewed.
- During **July, August and September**, in collaboration with GMA, the strategic component of the NOSCP document will be drafted. This will include a description of the relevant national frameworks, environmental and socioeconomic sensitivities, and the nature of the risk posed by potential sources of a persistent oil spill.
- Development of GIS sensitivity map. The data will be provided to GMA at the end of the Project. BP have kindly contributed their own data related to GIS mapping for The Gambia, and where relevant, these data will be incorporated into the data set developed for this Project.
- A workshop will be held in The Gambia during the second week of **September**. An agenda is under development and will include a round table session with key stakeholders to finalise roles and responsibilities and the organisation of a response from both an inter and intra-agency perspective. The majority of the time will be dedicated to delivering training to stakeholders in line with IMO OPRC Level 1 and 2 content, which will be tailored for the specific risks and conditions identified in The Gambia.
- Draft document of a recommended NOSCP and gap analysis / recommendations report will be provided to GMA end of **November**.
- Finalisation and approval in **December** which will conclude this project.

Appendix 1 Sites visited during June field surveys

Description	Sensitivity type	Latitude	Longitude
Start point - African Princess Hotel	Socioeconomic	13.45541	-16.7157
Kartong - fishing port	Socioeconomic	13.0733	-16.7439
Kartong - protected area	Environmental	13.07313	-16.7458
Kartong- protected area	Environmental	13.07332	-16.7461
Fish meal plant	Socioeconomic	13.15407	-16.7791
Gungung - fishing port	Socioeconomic	13.15373	-16.7791
Sand mine	Socioeconomic	13.2653	-16.7821
Mud flats - livestock grazing	Socioeconomic	13.26445	-16.7865
Sanyang - fishing port	Socioeconomic	13.26371	-16.7899
Sand mine	Socioeconomic	13.34486	-16.8101
Tanji- fishing port	Socioeconomic	13.35567	-16.798
Fish processing facility	Socioeconomic	13.35579	-16.7975
Ice manufacturing	Socioeconomic	13.35579	-16.7975
Brufut fishing port	Socioeconomic	13.38435	-16.7758
Bakau- fishing port	Socioeconomic	13.48205	-16.6762
Mangrove	Environmental	13.47582	-16.664
Mangrove	Environmental	13.46804	-16.6302
Industrial zone	Socioeconomic	13.4687	-16.6221
Banjul - fishing port	Socioeconomic	13.45077	-16.5704
Mangrove start point	Environmental	13.43518	-16.6089
Shrimp Trap array	Socioeconomic	13.43724	-16.5749
Shrimp Trap array	Socioeconomic	13.42915	-16.5719
Shrimp Trap array	Socioeconomic	13.39991	-16.6017
GP pipeline	Socioeconomic	13.38465	-16.5681
GPS pipeline	Socioeconomic	13.37923	-16.5558
Shrimp Trap array	Socioeconomic	13.43187	-16.5758
Redd+ Mangrove Project	Environmental	13.39743	-16.6467

Appendix 2 List of information and data requested from stakeholders during meetings

Category	Information requested	Agency /ies	Date Received
Legislation	The National Petroleum Act (electronic copy)	PC	Hard copy
	The National Petroleum Products Act (electronic copy)	PC	Hard copy
	The Marine Zoning Act (electronic copy)	GM	-
	The National Petroleum Products Importation Act (electronic copy)	PC	Hard copy
	Revised Hazardous Chemicals & Pesticides Control and Management Act 2017	NEA	23/05/2023
	Act establishing the powers and remit of NEA.	NEA	-
	The National Tourism Act and related Regs (electronic copy)	GTB	-
	The Port Authorities Act	GPA	-
	The 2007 Fisheries Management Act and 2008 Regulations	DoFish	17/07/2023
	The Marine Pollution Act and Regulations	GMA	10/07/2023
	The Gambia Multi-Hazard National Contingency Plan - Final Draft	NDMA	12/05/2023
Operational	Environmental management / facility level pollution response plans for GP and GPS and Port of Banjul	GPA/GP/GPS	Received hard copy from GPA for Port of Banjul
	List of licenced waste processing and a list of licenced waste treatment facilities (incineration, landfill and other)	NEA	-
	An overview of GIS data held by NEA	NEA	-
	Documents on their command structure and communications SOPs.	Navy	-
	List of all assets with specifications (as summarised in their presentation)	Navy	-
	Details of MARPOL oil waste collection and processing, industrial cleaning services, other relevant contractors (manpower, cleaning and tools/waste handling)	GMA/ NEA	-
	Excel or GIS data of location of fish landing sites, aquaculture, oyster, processing facilities.	DoFish	-
Strategic planning	O&G Exploration: FAR HSE Reports, Aug 21, Sept 21, Oct 21, Nov 21, Dec 21	PC/NEA	21/07/2023
	EIAs and OPEPs for Exploration sectors A2 and A5, 2018	PC/NEA	21/07/2023
	Investigation report on the 2022 GP pipeline spill	GP	21/07/2023
	List of industrial facilities situated dependent on water – intakes, discharge pipes, etc.	NEA	-

Category	Information requested	Agency /ies	Date Received
	Fisheries Mapping, Oyster Management plan, Shrimp Value Chain August 2010	DoFish	17/07/2023
	Background information – fisheries profile: catch composition, production volumes, no. registered vessels and fishers, gear types.	DoFish	21/07/2023
	Marine and coastal protected areas (location and description / rationale for protection)	DPWM	21/07/2023
	Distribution of marine species, associated sites, protected areas and sensitive habitats: BFCWR and Turtle management plan, TBR and Turtle management plan, Dolphin Phase II report, first Quarterly Report (Manatees), final monitoring report	DPWM	13/06/2023
	For the Port of Banjul and GP: number of each vessel type and size per year and number of vessels, cargo type and quantity discharged at pipelines.	GP	Received for GP