

Environmental management of offshore oil development and maritime oil transport

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PROGRAMME RÉGIONAL DE CONSERVATION
DE LA FAUNE, DE LA FLORE ET DE LA MER
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The objectives of the Regional Program for Conservation of the coastal and Marine Zone in Western Africa, PRCM are to coordinate the efforts of institutions and individualities for a better conservation of the littorals of the countries of the sub region, which are Mauritania, Senegal, The Gambia, Guinea Bissau, Republic of Guinea and Cape Verde.

This coordination seeks to strengthen the global coherence between the interventions, put together the existing resources, highlight and valorise the regional competencies, facilitate exchanges of experiences, develop various actions for research, training, communication and lobbying in order to promote a sustainable development dynamic in the coastal and marine zone of Western Africa to the benefits of societies.

a joint initiative of



In partnership with the CSR (Sub regional Fishing Commission)
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However, responsibility for the contents and for the opinions expressed in this paper are those of the authors.

The authors would be pleased to receive any comment about the content and opinions expressed in this paper and on suggestions for how future editions could be strengthened. Please send comments to srkloff@hotmail.com and clive.wicks@wicksfamily.plus.com.

The material and the geographical designations in this report do not imply the expression of any opinion whatever on the part of the authors concerning the legal status of any country, territory or area, or concerning the delimitation of its frontiers or boundaries.

Aim

This report deals with formulating a regional legal framework for environmental management of offshore oil development and maritime oil transport in the West African Marine Eco Region. However, no final policy recommendations will be presented on how this specific legal framework should look like. Instead, the authors will provide a selection of important building blocks that will help governments in the region to create an environmentally sound legal framework in close collaboration with local stakeholders. The ultimate purpose of this report is to inspire policymakers, those who wish to influence policy as well as other stakeholders in the region to initiate a dynamic and on-going policymaking process aimed at preserving the marine environment while engaging in oil exploitation.

The report is divided into three parts. The first part contains background information to oil and gas development worldwide, the West African regional situation and national energy and sustainable development plans. The second part contains information on current and future sources of marine pollution in the region and outlines direct and potentially negative ecological consequences of maritime oil transport and offshore oil extraction. The last part is devoted to international, regional and national policies and legislation.

Part 1. Background information

Oil and gas extraction create most of the energy and resources needed to run our society. They also result in a range of present and future environmental and social costs, both direct and indirect, which need to be balanced against the benefits they bring. The oil and gas industry impacts on people and the environment in different ways; through climate change, operations on land and at sea, and through positive or negative impacts on national economies. Unregulated and irresponsible actions by the oil industry destroy habitats, damage biodiversity and harm other economic activities.

The industry is considered by many civil society organisations to have contributed to corruption, pollution and civil disturbance – including wars – in a number of countries, notably in Africa. These issues were covered in the World Bank's Extractive Industry Report (EIR) and the summary report by its distinguished Chairman Dr Emil Salim and his press statement: *“Not only have the oil, gas and mining industries not helped the poorest people in developing countries, they have often made them worse off.”*

International and National efforts have been made to help resolve the problems with the Industry. These include the UN Convention on Corruption, the Extractive Industries Transparency Initiative (EITI), the OECD Guidelines for Multi National Companies and the World Bank Groups Guidelines for financing projects. Governments have been asked to sign the International Conventions and to insist that companies sign and respect the EITI or similar initiatives.

West Africa

In West Africa numerous tensions, disputes, armed skirmishes and pollution are associated with oil exploitation. The UN Secretary General has appointed a special advisor in the region. The Advisor reports that tensions are often caused by delimitations of disputed land and maritime borders, between governments and oil companies on contracts and revenues, between governments and their populations on revenues and redistribution, within countries between local authorities and tribal groups over rights, and disputes between oil companies. The UN

is trying to resolve these issues through arbitration and negotiation. In order to reduce tension, they advise transparency in all dealings with the oil industry. Companies should therefore publish what they pay, local governments should inform the public on how oil revenues are used, and finally revenues should be used to favour development. Transparency will help ensure that oil revenues will be beneficial to the countries and supportive of democratic reforms which will minimise the risks of wars and increase stability.



*Oil spill fire in the Niger Delta, Nigeria
(Photo: Urhobo Historical Society)*

National Sustainability plans

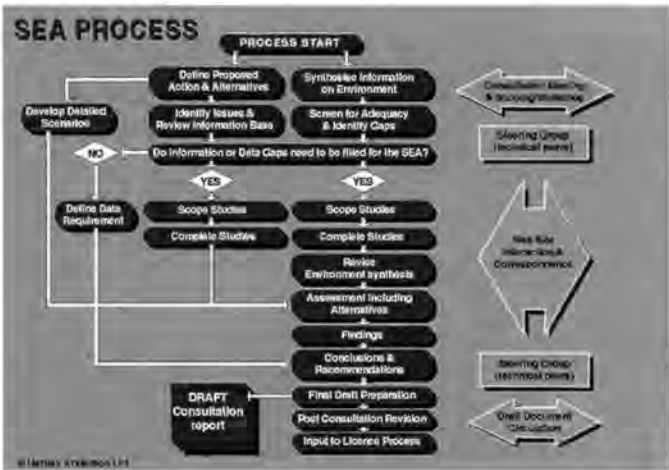
Oil and Gas exploitation should not be seen in isolation, it needs to be looked at in the context of National Sustainability Plans (NSPs). These were recommended at Rio and Johannesburg, World Commissions on Sustainable Development (WCSD's). NSPs should cover the National Energy strategy including long term renewable energy needs of the country and set the framework for the Oil and Gas Industry.

Oil and gas reserves can be depleted very quickly leaving countries with no fossil fuels or funds to purchase increasing expensive fuels. This is especially true for the relatively small reserves in the West African Marine Eco Region. The development of renewable sources of energy should keep pace with extraction rates of fossil fuels. It is moreover vital that the National economies stay diversified and will not become overly dependant on oil revenues (Dutch disease/Paradox of plenty). Estimations on how much and how quickly the oil reserves will be depleted will help governments obtain an idea of the economic benefits and will enable them to measure benefits against potential risks and environmental and socio-economic costs.

Strategic Environmental Assessment

A model for making well balanced decisions about offshore oil development has been developed by the United Kingdom (UK) Department of Trade and Industry (DTI), which is called Strategic Environmental Assessment (SEA). A SEA is conducted at a strategic level - this in contrast to the commonly used Environmental and Social Impact Assessment (ESIAs) which are only carried out for a specific activity and often ignores cumulative impacts of the entire development plan on the environment and the economy. A carefully carried out SEA will identify the issues and concerns that should be addressed, key information and perceived gaps in understanding of the natural environment and will provide an idea about the net impacts resulting from offshore oil development. During the process DTI consults a large range of stakeholders and independent experts. Today, SEAs are recommended by the World Bank group and the European Union.

The West African Marine Eco Region



In 2001, oil was discovered in the West African marine and coastal ecosystem. This ecosystem includes the marine systems of six countries: Mauritania, Senegal, Gambia, Guinea Bissau, Guinea and Cape Verde and spans 3,500 kms of coast. Among its most striking features are the unique coastal wetlands and the up-welling of deep nutrient-rich ocean water to

the surface that support one of the most diverse and economically important fishing zones in the world. The fact that many marine species pass different phases of their life cycles in the waters of the six countries underscores the need to understand and manage the continental shelf of this region as a whole.

Fisheries in this region generate some 500 million Euros annually, which makes it currently the single most important source of foreign exchange and a key source of revenue for economic and social development. Coastal Tourism is also becoming an increasingly important economic activity.

Oil can produce vital income for the countries in the region but may also have a detrimental effect on fisheries and coastal tourism. Policymakers of the West African Marine Eco Region need to make sure that the great expectations arising from offshore oil are fulfilled and not followed by disappointment. Economic development on the continental shelf should be assessed at a strategic level. The outcome of such an assessment could be that offshore oil extraction will not always be the best development option in every area of the continental shelf.

Vulnerable ecosystems, like for example coastal wetlands and areas that are known to have an important function as a nursery for (commercial) marine species, could be irreversibly damaged if offshore oil extraction would be allowed in or near these areas. Also careful planning of the period, in which certain exploration activities could be allowed to take place, will be crucial to keep negative impacts on fisheries within acceptable limits.

Part 2. Environmental impacts of maritime oil transport and offshore oil development

In coastal sea areas with intensive offshore production such as the North Sea, oil pollution is mainly caused by activities based on land. Offshore oil exploitation is the next largest polluter and adds significantly more oil to the regional pollution balance at sea than maritime traffic.

Maritime oil transport

Chronic oil pollution arising from maritime traffic decreased over the past decades. Today, the largest proportion of routine oil pollution has shifted from cargo tank cleaning to illegal discharges of oil from machinery rooms. The introduction of non indigenous species carried in ballast water is another important cause for environmental stress associated with maritime traffic. Toxic substances in antifouling paint that are used to prevent encroachment of marine organisms on a ship's hull or on offshore installations may also upset the marine ecosystem.

Seismic surveys

Offshore oil development usually starts with seismic surveys. These surveys involve generating loud and mostly low frequency sound waves. Scientific research shows that cetaceans are extremely sensitive to these surveys. Seismic surveys also have a negative impact on fish. Fish catches in an area where seismic surveying took place can be temporarily reduced by 40 %. Marine scientists argue that impacts can be more profound and long-term if these studies are carried out while fish migrate or spawn or if they take place in shallow water and in so-called nursery areas for fish. Rules that help oil companies choose how, where and when to carry out these surveys could significantly minimise negative impacts.

Offshore development

The next step in offshore oil development is exploratory drilling, and if successful, exploitation will follow. The development of offshore oil is associated with noise and vibration, solid and liquid production wastes (drilling cuttings, fluids and production water), increased water column turbidity from dredging, disturbance of the sea bed areas, avoidance of the area by fish and marine mammals due to construction noise, vibration and the presence of erected facilities, and possible invasions of non-indigenous species carried in ballast water of support vessels and oil tankers. The environmental stress may result in different biological responses. Unregulated oil exploitation may lead to complex transformations at all levels of the biological hierarchy and end in a decline of (commercial) marine organisms.

Production water

The largest and continuous discharges arising from offshore production platforms is from production water which increases as the oil in the reservoirs is depleted. This water contains high salt concentrations, heavy metals, dissolved oils, Polycyclic Aromatic

Hydrocarbons (PAHs) and occasionally radioactive substances. PAHs are highly toxic, long-lasting substances that can build up in the food chain to levels that are harmful to humans and ecosystems. A Norwegian study recently showed that exposing fish to very low levels of PAHs results in a feminisation of male fish, which significantly reduces fertility and delays the spawning period with several weeks. There are different methods to dispose of waste products e.g. production water, drilling fluids and cuttings: overboard discharge, ship-to-shore, re-injection or disposal in a platform core or especially drilled underground structures. The first form of disposal is the easiest and cheapest but unfortunately also the most environmentally damaging method.

So-called “low energy habitats” or coastal wetlands of the West African Marine Eco Region, (mangroves, estuaries or salt marches) are particularly vulnerable to relatively small amounts of oil pollution and other waste products that may be routinely discharged by offshore oil installations.

Oil spills

Oil spills, an acute form of pollution, can arise from both oil tankers and offshore oil installations. Consequences are especially disastrous if the oil washes ashore and accumulates in sediments of shallow coastal zones. Coastal wetlands and mangrove forests are extremely vulnerable to oil spills.



Blowout of the exploratory well, Ixtoc 1 in 1979 in Mexico (Photo: NOAA)

Small accidental oil spills usually arise during routine operations when oil is loaded and discharged in ports or at oil production platforms. The amount of oil spilled during these terminal operations is on a worldwide scale 3 times of an order greater than the total amount of oil spilled after accidents with oil tankers.

Large accidental oil spills due to oil tanker accidents are the best known examples of acute oil pollution. Accidents can arise after grounding of an oil tanker, collisions with

other vessels, cargo fires and explosions, technical failure or human error. Large accidental spills involving offshore oil installations can be caused by “blowouts” of wells, technical failure, human error or pipeline ruptures.

Floating Production, Storage and Offloading systems (FPSOs)

It is predicted that most offshore oil fields off the West African coast will be developed with production facilities that look like oil tankers, so-called Floating Production, Storage and Offloading systems (FPSOs). An FPSO can either be newly built and double-hulled or be a converted large single-hulled oil tanker. The hull of an FPSO may be perforated in the same way as an ordinary oil tanker after collision with another vessel. Single hulled FPSOs are

not allowed in USA waters and the bulk of FPSOs in European waters are double hulled. If the West African Governments agree, some of the FPSOs destined for West Africa will be made out of single-hull oil tankers that are not allowed to navigate anymore under international law by the year of 2007. The Industry and some scientists argue that these relatively old (25-28 years) converted single-hulled FPSOs are nevertheless a safe development option for this particular region. Other scientists and some civil society groups believe that double-hulled FPSOs should be used as a standard everywhere in the world. They furthermore argue that double-hulled FPSOs should be used as precautionary measure especially in areas of high marine biodiversity and in regions where high collision risk prevails because of dense maritime traffic. The West African Marine Eco System combines both these characteristics.

Part 3. *Regulating maritime transport of oil and offshore oil development*

Virtually all aspects related to maritime oil transport are covered by conventions of the UN agency for maritime traffic, the International Maritime Organisation (IMO). Currently the bulk of international regulations for marine pollution caused by ships are contained in the International Convention for the prevention of Pollution from ships, more commonly known as MARPOL 73/78. It contains detailed information on how oil tankers should be built, it provides exact discharge limits for oily waste products, garbage, sewage and air emissions and dictates hull configuration for oil tankers (aimed at reducing the likelihood of oil spills after collisions or groundings). - MARPOL requires mandatory retirement for single-hull tankers at 25 years of age and a phase out of large single-hull tankers by January 2007 (whichever comes



Head quarters of the International maritime Organisation (IMO) in London

first).- Other IMO conventions set rules for ballast water management and antifouling paint. Conventions designed to reduce maritime casualty are the Convention for the Safety of Life at Sea (SOLAS) and the Convention on Standards of Training, Certification and Watch keeping for Seafarers (STCW). The former convention contains rules for safety provisions such as fire prevention and control and the number of life boats and jackets per passenger. The latter convention covers standards for competence of seafarers. IMO's Civil Liability Convention and Fund Convention arrange compensation to oil spill victims and to cover clean up costs after accidents with oil tankers.

International law for maritime traffic

International conventions are legally binding on national governments, which are obliged to implement the internationally established rules and regulations through their own national legislation. In addition to international legislation some countries have written extra stringent regulations for ships that trade in their Exclusive Economic Zone (EEZ), the 200 nautical mile zone as defined by the United Nations Convention on Law of the Sea (UNCLOS). The USA and countries of the European Union no longer accept single-hulled oil tankers in their ports or at their offshore facilities. However, these single-hulled tankers are still allowed to navigate under international law. Coastal states are powerless when international vessels are on "innocent passage" through their EEZ (vessels that do not trade in that zone and constitute no acute environmental hazard). Nevertheless, one way for coastal states to exercise some influence on this transiting maritime traffic is to establish "Areas-to-be-Avoided", Particularly Sensitive Sea Areas (PSSA) and Special Areas (SA) under the provision of the International Maritime Organisation, (IMO).

Sensitive Sea areas and special regulation for transiting maritime traffic

Special Areas are specifically provided for under MARPOL in cases where certain areas of the sea require greater protection from oil discharges and disposal of household garbage

than provided by the generally applicable rules written for international maritime traffic. Coastal States may apply for "Special Area" status for sea areas at special risk from ship-source pollution, in order to benefit from stricter requirements, including a complete prohibition on discharges. These special discharge limits apply next to ships also to offshore production installation but only to the oily residues arising from engines or ballast rooms. MARPOL or this special status has no effect on the oil content in substances that are directly arising from exploration or exploitation activities (e.g. drilling cuttings and fluids or production water). Most existing Special Areas are very large, encompassing the EEZs of one or more states, or even an entire enclosed or semi-enclosed sea.

Next to Special areas, the IMO has also developed the concept of the Particularly Sensitive Sea Area (PSSA), which is defined as: *"an area that needs special protection through action by IMO because of its significance for recognized ecological, socio-economic or scientific reasons and which may be vulnerable to damage by international shipping activities."* PSSAs are smaller than Special Areas. At present, PSSAs do not have any specific protective mechanisms that automatically come into effect upon their designation. In each case, it is up to the proposing Member Government to select and propose a measure available through the IMO, such as routing measures, strict application of MARPOL discharge and equipment requirements for ships or installation of Vessel Traffic Services (VTS). One major advantage of obtaining this status is that it brings international recognition to the special importance of a designated area and informs seafarers of the importance of taking extra care when navigating through the region. The process of preparing a PSSA proposal is also helpful as it provides States with a framework to identify sensitive areas and address risks from international shipping. This framework could also be useful in order to identify no-go zones for offshore oil development that should be protected under national law.

An Area to be Avoided (ATBA) can close an area to all ships or just certain sizes or classes of ships, such as large tankers or ships carrying other hazardous cargoes. An ATBA is defined as: *"An area within defined limits in which either navigation is particularly hazardous or it is exceptionally important to avoid casualties."*

Lack of international regulations for offshore oil development

While International legislation for maritime traffic is fairly comprehensive, there are considerable loopholes in the international legal framework for offshore oil development. There are no international conventions for design and hull configuration of offshore production facilities (including FPSOs), safety measures, training and certification for offshore workers and discharge limits for typical waste products (e.g. drilling cuttings and fluids and production water). Also the compensation schemes for oil spill victims and clean up costs after spills arising from offshore production platforms are not regulated on a global level. The renowned Canadian Maritime Law Association (CMLA) has addressed the need for an international legal framework many times: *"The need for a comprehensive international convention on offshore units would present to the international community a consensual regime on all relevant matters which would avoid piecemeal and fractured responses by individual nations and the international community"*.

International obligations to formulate regional conventions for offshore oil development

The governments of the West African marine and coastal eco-region have the obligation (under international law) to adopt the concept of a comprehensive regional convention for offshore oil development. The Declaration of the United Nations Conference on the Human Environment (1992) Rio Declaration¹): “States, acting individually, bilaterally, regionally or multilaterally and within the framework of IMO and other relevant international organisations, whether sub-regional, regional or global, as appropriate, should assess the need for additional measures to address degradation of the marine environment from offshore oil and gas platforms, by assessing existing regulatory measures to address discharge, emissions and safety and the need for additional measures.” UNCLOS: “States shall establish global and regional rules for the control of marine pollution arising from offshore units and seabed activities” and: “States need to ensure that sufficient recourse is available under their legal systems for prompt and adequate compensation or other relief in respect of damage caused by pollution to the marine environment”.

Several international organisations developed guidelines to help States formulate national or regional laws for offshore oil development. Regional conventions for the North Sea and the North East Atlantic Sea Area (OSPAR) and the Baltic Sea (Helcom) could be used as examples. States adjoining these sea areas have developed a comprehensive regional legal framework which includes discharge limits for all waste products (e.g. production water and drilling fluids and cuttings). Many countries of these areas have also installed special restrictions to seismic surveys (prohibition during migration of key species and fishing periods). Discharge of oil-based drilling muds into the sea is strictly forbidden under Helcom and OSPAR. Thanks to recent scientific evidence about the negative ecological impacts of overboard discharge of production water this waste product is being increasingly re-injected into the geological formations. In many countries, overboard discharge of production water and other waste products is strictly prohibited in or near ecological vulnerable areas. However, overboard discharge still continues in ecologically vulnerable areas (coastal wetlands, mangroves) in Nigeria, Angola, China and Thailand.

The United States are developing increasingly strict discharge limits and limitations to exploration activities as well as clear national laws for the design and hull configuration of FPSOs – they only allow new and double-hulled FPSOs in a limited number of areas in the Gulf of Mexico.

The International Convention on Oil Pollution Preparedness, Response and Co-operation 1990 (OPRC Convention)

This convention defines the basic elements for co-operation between government and industry in marine (oil) pollution response. Emphasis is given in the Convention to developing contingency plans, equipment stocks, research and development initiatives, training and exercise programmes, and appropriate spill notification procedures. The spiller has the obligation to report oil spills and other casualties. However, oil spills that arise during terminal operations are in reality largely left unreported. Fingerprinting of the unique characteristics of the oil may in these cases help governments to retrace the perpetrator.

Citizen's advisory councils

Creating a solid legal framework for offshore oil and maritime oil transport is a complex task. Some important building blocks and examples from elsewhere are presented in this report. The convention for the West African Marine Eco Region should take the specific needs and characteristics of this particular ecosystem into account. Fishermen, scientists and conservationists possess valuable knowledge on the local ecosystem which is essential to create a solid regional framework. However, stakeholders do not always have the time or resources, and often lack the technical knowledge about offshore oil development in order to effectively contribute to long and complicated decision-making procedures. Citizen councils in which representatives of key stakeholders are united, similar to the Alaska and the Shetland Islands councils may provide governments and the industry with a workable framework for effective stakeholder consultation. The aim of the council in Alaska is furthermore to give continuous feedback to the industry and government in order to improve operations and to prevent accidents. Today, the council has been responsible for major improvements in the safety of the oil transportation system. Also citizen confidence in oil development markedly increased after the creation of the council. People involved with the Alaska and Shetland Islands councils are willing to provide support to governments and stakeholders of the West African Marine Eco Region.

About the authors

The authors are members of the IUCN Commission on Environmental, Economic and Social Policy (CEESP). At present they are establishing a Working Group within the Commission on Participative Management of Oil and Gas Development.

Sandra Kloff is a marine biologist and studied the role of Antarctic micro algae in global warming processes and researched the impact of marine pollution on species composition of micro algae in a coral reef ecosystem. In 1995 she initiated a research programme for the Dutch Royal Tropical Institute (KIT) on the proliferation of aquatic vegetation in the lower Senegal River Basin. From 1998 until 2000 she worked for the IUCN in Mauritania as an assistant project manager in the regional programme for the conservation of coastal wetlands. She currently works as a consultant. She provided technical advice to local stakeholders on aquatic weed management in Nigeria (UK Department for International Development – DFID), Senegal (KIT; Direction of National Parks) and Mauritania (KIT; Diawling National Park). She worked in Spain and Gibraltar with environmental groups on coastal zone planning, offshore oil development and atmospheric pollution arising from heavy industries. Since 2001 she also provides technical advice to stakeholders in Mauritania on offshore oil development.

She is member of:

- the steering committee of the Mauritanian NGO Mer Bleue. Mer Bleue is comprised of fishery community members and scientists that advocate for an equitable and sustainable use of the marine and coastal environment.
- Ecologistas en Acción, a union of environmental grass-root organisations in Spain.
- The Environmental Safety Group in Gibraltar

Clive Wicks has worked in the environmental movement, mainly for WWF (World Wide Fund for Nature), for the last 17 years following 25 years experience of working in Africa with an international company latterly as a company Director. He is currently a Conservation and Development Consultant working on the impact of oil, gas and mining industries. He represented the WWF at G8, World Bank, IFC (International Finance Corporation), UNEP (United Nations Environment Programme), EU (European Union) and UNDP (United Nations Development Programme) meetings, on extractive industries and has worked on Oil and Gas issues in many countries including Alaska, Bolivia, Canada, Cameroon, Georgia, Indonesia, Mauritania, Nigeria, Russia, etc. He was the co-project supervisor for a WWF project on Criteria for Oil, Gas and Mining Companies working in areas of high biodiversity, which produced "To Dig or Not to Dig". He also worked with the Mining, Minerals and Sustainable Development Project (MMSD), Large Scale Waste and Biodiversity Committees in a private capacity.

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